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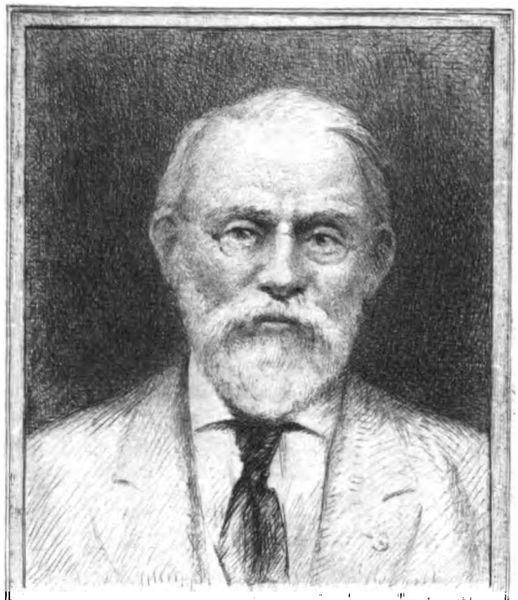

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THE TELEGRAPH AND TELEPHONE JOURNAL.

VOL. XIV.

October 1927 — September 1928.

LONDON : G.P.O. NORTH, E.C.1.

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THE

Telegraph and Telephone Journal.

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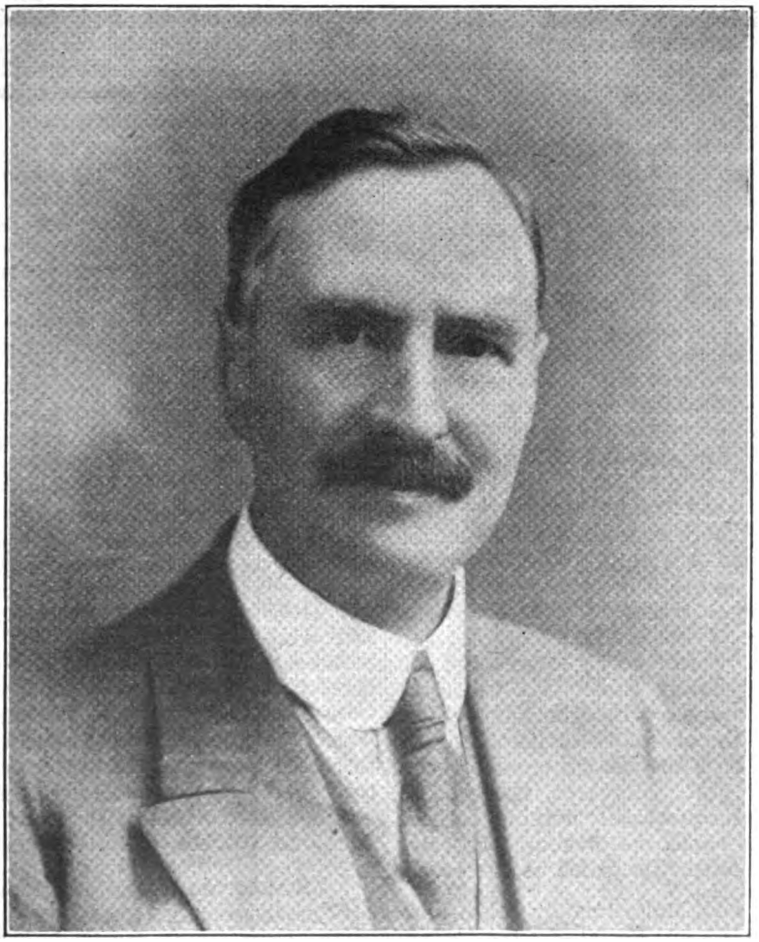
All correspondence relating to advertisements should be addressed to MESSRS. SELLS, LTD., 168, *Fleet Street, London, E.C.4.*

TELEGRAPH AND TELEPHONE MEN AND WOMEN.

XLV.—MR. A. L. CLOUGH.

MR. A. L. CLOUGH, whose portrait appears on this page, is the Chief Superintendent, Telegraphs, at the Liverpool Post Office. That invaluable compendium, the Establishments Book, records the particulars about Mr. Clough that he was born in January, 1868, that he became an established Post Office servant in 1885 and that he was appointed to his present post in October, 1925. It pays no heed to birthplaces and other interesting but non-essential facts, but we may surmise that from first to last Mr. Clough has been a Liverpool man and that he entered as a youth the particular department of which he is now in charge.



It is not an easy task to convey in a few sentences a true and adequate picture of Mr. Clough's many-sided personality. In telegraph circles, Mr. Clough is a man of note. He has a thorough knowledge of his business and a broad-minded grasp of current problems, and his views are held in such esteem that on several occasions he has been summoned to special conferences at Headquarters. In private life he is the best of good fellows, with a knowledge of affairs, a sense of humour and conversational gifts which make him the most charming of companions. The passage of time has brought no diminution of these qualities and only the authority of the Establishments Book can make one believe that the sands of his official life are running low. The fact that his retirement cannot be far distant will bring deep regret to his many friends in the Post Office service.

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RECONSTRUCTION OF THE GERMAN FOREIGN TELEGRAPH SYSTEM AFTER THE WAR.

By WALTER KRAUSE.

WHEN after the outbreak of the first flames of the great war, the apparatus on the great foreign telegraph communications connected with the East stopped, and when, on the following days, the instruments indicating the currents on the foreign circuits to the West also failed to operate, the telegraph operator could not help feeling at a loss. He knew the seriousness of the time and realised the critical moment of the world-crisis more impressively in the general telegraph office than in any other place of human existence. We remember how a year later the meshes of the European telegraph network, stretching to the south and south-east, broke off on the frontiers and lost connexion with their centre, the general telegraph office, so that from this point a few threads only reached to the small neutral neighbouring countries. Further, many friendly and helpful relations between officials of the German general telegraph office and their foreign colleagues were suddenly destroyed for years. Finally, the gradual withdrawal of the neutral countries was particularly painful.

He who believed that after the conclusion of peace the general telegraph office would regain as soon as possible its former important position, due to its central position in the European international telegraph system, had deceived himself.

Owing probably to political and economic motives, the nerves of the international telegraph traffic on the old and new empire frontiers were knotted only hesitantly and loosely. Thus the offices of the former hostile States were reached for the first time after the termination of the war, as follows: London, Aug. 23, 1919; Antwerp, June 14, 1919; Milan, Aug. 11, 1919; Rome, Sept. 5, 1919; Brussels, Nov. 16, 1919; Paris, Dec. 18, 1919: and Bukarest not until Feb. 13, 1924. Apart from the last-named telegraph office, Bukarest, where the reintroduction of the system took place by means of the effective Siemens apparatus, all the other offices communicated with the German general telegraph office by means of the slightly less effective Hughes system of communication. In consequence of the very insufficient means of communication, telegraphic communication with the places mentioned suffered extraordinarily. Especially on the London line (to which, however, a second Hughes circuit was added) the mass of telegrams destined for transoceanic countries caused serious congestion, because cable communications no longer existed and the German wireless communication to America, in consequence of atmospheric troubles and other imperfections, had not yet attained its world reputation. The traffic relations with the other foreign countries were, however, considerably more favourable, but the lines connected with those countries had lost much during the years of war with regard to their structural quality, and were therefore subject to interruptions and, with the use of Hughes apparatus, could not afford a rapid outlet for telegrams. In consequence of the gradual decay of the German currency, an inundation of telegrams occurred which partly overflowed on to the foreign circuits. Especially during those days when the Stock Exchange was opened, the masses of telegrams increased, not only in the inland lines where the enormous totals of 230,000 to 250,000 were reached, but also on some foreign circuits; and many of them had to be sent by post. Moreover, the gigantic work to be mastered daily was done for practically nothing, because the German Postal Administration could not increase the rates afst enough to keep pace with the fall in the value of money.

During this time of hard, and unfortunately also non-productive, telegraph work, the German Postal Administration accomplished the great work of repair and partial renovation of its extensive system, thereby desiring to obtain a security of operation as perfect as possible. The most important foreign circuits such as to London, Antwerp, Amsterdam, Rotterdam, Oslo, Riga, Basle, Zurich and Vienna, were gutta-percha cables nearly fifty years old. As these great telegraph cables would shortly become unfit for utilisation, an attempt was made to use the new toll-cables for simultaneous telegraphy by means of alternating currents. This gave excellent and successful results. Where cable circuits failed, excellent bronze wires were used and valuable reserve wires became available for foreign telegraphy.

In view of the fact that expensive communications can be fully utilized in an economical manner only by the use of efficient apparatus, the Siemens system on 19 foreign lines outgoing from the general telegraph office was reorganized, and Baudot working has been introduced by agreement with the foreign administrations concerned on five lines, whilst for six further circuits it is intended to use the Creed apparatus.

It may be said that the German telegraph system has now available a splendid set of telegraphic equipment, and has never possessed better.

The reconstruction work described above was finished in a relatively short time. Unfortunately, the economic success of these expensive telegraph arrangements was for a long time very small, owing to the insufficient utilization of the international telegraph lines through Germany. Even up to four years ago there was a danger of a further decrease of this traffic and a fear that the general telegraph office would lose its reputation as the greatest transit office of Europe. This danger was apparently due to the fact that offices of formerly hostile States as well as those of the neutral countries maintained till long after the conclusion of peace the custom initiated at the outbreak of the war, of directing their telegrams by roundabout routes. The motives for the deviation of the telegraph traffic over lines not passing through Germany were probably to be found in the fact that in foreign countries confidence in German telegraphy as well as in German currency had unfortunately decreased. The lost confidence in the German Postal Administration could only be restored if that Administration succeeded in convincing the foreign countries by the quality of German telegraph work of its speed and accuracy to such a degree, that the roundabout routes so far utilised would willingly be given up for economic reasons.

An organised work of reform aimed at the reduction of the circulation time as well as the securing of a rapid flow of the whole foreign telegram traffic on all-important German lines connected with foreign countries. The general telegraph office took the following steps:—

The staff engaged in the operation of the foreign lines was specially chosen, had a knowledge of foreign languages, and also tactfully guaranteed friendly co-operation with foreign offices. By avoiding a frequent change of staff, the operators became well acquainted with the customs and traffic relations of the foreign offices. The cultivation of foreign languages was promoted by a course of instruction.

The fact that the circulation time of the telegrams, from their arrival at the general telegraph office up to their dispatch, was reduced to 10 to 12 minutes by steps which need not be explained here, did not overcome the difficulty of lack of speed in the foreign transit traffic. A further reduction of the circulation time for this traffic was reached by the foreign telegrams received being brought by the receiving operator himself to the apparatus destined to transmit them onwards. To facilitate this method, the apparatus destined for offices with great exchange traffic was arranged alongside, so that the telegrams received could be handed over.

All these measures brought such success that for the greater part of the foreign transit traffic the circulation times are now negligible.

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To regulate the flow of the telegrams over the great German foreign circuits an inspection point was established whose task, based on the advice given five times daily by the larger German telegraph offices, is to regulate the flow of the whole of the foreign telegram traffic by assigning lines on which the telegrams can reach quickly their foreign destination, so that stoppages at any point can be avoided.

The traffic conditions between each forwarding office and the principal foreign destinations are signalled to the general telegraph office by the following code :—

White	... ...	Waiting time of the traffic up to ½ hour
Green	... ...	,, ,, ,, ,, ,, 1 ,,
Red	... ...	,, ,, ,, ,, ,, 1½ ,,
Blue	... ...	,, ,, ,, ,, ,, 2 ,,
Black	... ...	Waiting time of the traffic more than 2 hours.
Star	... ...	The communication is temporarily interrupted.

At the general telegraph office these colours are reproduced on a chart which shows the destinations in columns and the forwarding offices in horizontal lines. The absence of direct communication is indicated by vertical strips.

In consequence of continuous practice, it is sufficient for the inspection point to cast a glance at the summary in order to effect the necessary regulations. Ten minutes after the arrival of the advices, most of the offices concerned have already received instructions as to which routes may advantageously be adopted.

The arrangement has stood the test extraordinarily well and has therefore found great approval not only by the greater German offices, but also by those foreign offices, which serve as intermediaries for German foreign traffic, e.g., Basle, Zurich and Vienna, which are interested in this method of announcement. London is included in so far as the general telegraph office daily communicates to it the incidence of the traffic between Great Britain and the European countries.

For a successful further evolution of the foreign transit traffic, it is of the greatest importance that the offices and the administrative headquarters are always kept informed as to the extent and the development of the foreign transit traffic.

For this purpose statistics are prepared four times a month as to the number of the foreign telegrams transiting Germany as well as to their waiting times. From this summary it can be determined if the value of the telegraph work has increased or fallen, if an increase of the traffic or a deviation has taken place, and if in a certain case steps can be taken to prevent such a deviation in traffic.

Finally, it may be noted that in this limited space only the most important works of reconstruction could be mentioned. But as regards the success attained up to the present, a few figures may be cited. The foreign traffic of the general telegraph office amounted before the war to about 32,000 telegrams daily, of which about 8,000 telegrams were destined for Russia and beyond. The volume of traffic for the years following the war up to 1923 was very unreliable in consequence of the continually changing economic conditions in Germany. Therefore it gives no clear picture for the critical examination of the success of the reconstruction, and hence is not taken into account. In January 1924, the total number of foreign telegrams at the general telegraph office, including the radio-telegrams, averaged daily 20,000, and of these about 6,000 were foreign transit telegrams, 3,000 arriving in each direction. To-day the telegraph traffic on the foreign circuits outgoing from the general telegraph office has already reached the magnificient number of nearly 33,000, 5,000 of which are foreign transit telegrams. The success obtained up to the present is evident and requires no further explanation.

THE TELEGRAPH SERVICE—PAST AND PRESENT.*

By A. W. Edwards, O.B.E.,
Late Deputy Controller, Central Telegraph Office.

(*Continued from page* 241.)

It would, of course, be very difficult to make a clear cut from the policy which has prevailed and has led up to our present difficulties, but the fact remains that the Telegraph Service to-day, as in the past, is not a revenue-earning concern. If it can be accepted as a partial public subsidy all might be well, but unfortunately it is not. If the Telegraph Service was a Commercial and not a Government undertaking it would have been bankrupt years ago unless steps had been taken to place matters on a commercial basis. It must not be overlooked, Ladies and Gentlemen, that telegraphs have a very vigorous competitor in the Telephone Service and that if Inland Telegraphs were set aside to-morrow the Telephone Service would take its place in the commercial and social world to a very considerable extent. There is room for both Services in the ordinary course, but it is, I suggest, up to everyone concerned in the telegraph interest to do everything possible to give it life. Can its existence as a revenue-earning concern be sustained under present conditions ? I venture to say it cannot. What, therefore, should be done to make it a reasonable paying proposition and thus give it increased vitality ?

In the first place I suggest that the charges for telegrams should be made according to distance. The zone system would assist materially in regard to this. Press rates should be revised and the multiple rate should only apply to single towns. The establishment of telegraph offices should be carefully overhauled and all possible should be done to simplify the machinery of control. As compensation for any necessary reduction of supervisory appointments positions on the Engineering side and in other Departments should, as far as possible, be thrown open to telegraphists possessing qualifications for such positions. There is, in my judgment, much fine material in the Telegraph Service for positions of this character, and if such positions could be given to the men and women on the Telegraph side and the matter of age be less rigidly applied, this would go far to reduce the dissatisfaction which now exists in regard to future prospects. The Engineering side, for example, has obtained many excellent officials from the operating classes in earlier times, and it was unfortunate when these higher positions were, to a great extent, closed to the operative side of the business. The co-operation of the operative staff should be obtained for securing the best possible output, even to the extent of the introduction of the bonus wire system, as it must be evident to all concerned that unless such improved output be secured it is not possible to carry anything like the impedimenta which at present exist and at the same time obtain the necessary revenue to make telegraphs self-supporting. Then, again, to secure the necessary loads for circuits, the question of greater concentration during *other than the peak hours* requires careful study. At present the Telegraph Service is like an over-rigged ship carrying too much sail, for in addition to the direct higher telegraph appointments it is required to carry a percentage of the Secretarial, Accounting, Engineering, Stores, Traffic-Managing, &c., staffs in the maintenance of the Telegraph Service, and this obviously cannot be done on our present telegraph operating output.

I was recently looking at an old picture of the Provincial Gallery of the C.T.O., dated 1891, and I could not help being struck with the orderliness of the Gallery as compared with the present day. Every one of the operators is depicted as being well down to his or her work and the only persons shown as being on their feet are occasional Supervising Officers with the collectors and distributors. The picture gives point to my statement that an operator was listed for his circuit for practically the whole of his duty, in contradistinction to that which now obtains when, apart from the large number of officers of varying grades required to be upstanding, we have the spectacle at each hour of a general uprising of the staff for change from one circuit to another with its resultant loss of time (very considerable in the aggregate) and consequent effect upon output. In this respect I would venture to suggest that the staff would greatly assist the Administration by being a little less insistent that these hourly changes should be made.

Another picture shows a Circulation Table—and here again the simplification of the then circulating methods is exemplified by the small number of circulators at the table as compared with now. In those days circulation work in the Central Telegraph Office was specialised and there was a circulation staff proper. Primary sorting for Provincial stations only was performed, the telegraph learners engaged upon distributing work being required to learn the respective transmitting station of all telegrams placed in his or her box, and when uncertain of this to consult a simple reference book kept at a particular spot in the division to which he or she was attached—excellent training for the budding telegraphist. As regards the more complicated Metropolitan marking, this was done at the various circulation tables where the staff was sufficiently expert to be able to mark telegrams to a large extent from expert knowledge and with but little reference to circulation books.

* Paper read before the Telephone and Telegraph Society of London.

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This somewhat simple system went by the board in the earlier years of the present century when it was decided to mark all telegrams with the code of their transmitting office at the Provincial circulation tables and to abolish the circulating or code book in the Divisions. Later and in more recent years Metropolitan marking was specialised at a given point in the Metropolitan Gallery, and although this relieved the congestion at the Provincial tables the many changes of staff at this particular Metropolitan circulation point has not eliminated to any great extent the necessity for book reference.

Subsequent to the introduction of secondary marking at the tables it was found that the retention of women telegraphists on permanent circulation duties did not allow of a number of them being certified as able to perform efficiently all the duties of their class and so qualify for the Barrier increment. As a result it was found necessary to break down permanent circulation work and place telegraphists on part operating and part circulation work. As a consequence expertness on this particular class of work has greatly decreased, resulting in the necessity for the employment of more staff at the circulation tables by reason of increased book reference and adding much additional work in making the necessary corrections and increasing the number of books in use.

The establishment of a permanent circulation staff for the Central Telegraph office has on various occasions been considered, but for certain reasons, chief among which was that circulation duties provided relief from operating duties, it was not adopted. My own view is that not only would considerable economy be effected by such an establishment but that circulation work would be expedited by being in the hands of none but expert officers.

Some measure of economy might also, I think, be obtained in connexion with International working. In the year 1889 the various leases and concessions held by the Submarine Telegraph Company expired and the Post Office then took over the working of all their Continental cables together with the Company's staff. Under the Submarine Company's regime the traffic for the more important Continental cities had been signalled to a few transmitting centres in the respective countries, such as Paris, Havre, Berlin, Hamburg, Emden, Amsterdam, Brussels, Antwerp, &c.

Under Post office working further direct communication was established, and at the present time, apart from the Imperial Cable and Wireless working, London is working directly to many towns in France, Germany, Italy, Switzerland, Holland, Belgium and Norway. For example, London works direct to such French offices as Paris (Central *and* Bourse offices), Havre, Lille, Bordeaux, Calais, Boulogne, Lyons and Marseilles, and to such German offices as Berlin, Hamburg, Frankfurt, Emden, Leipzig, Bremen, and Cologne. While, however, London works direct to these and certain other towns in other countries, those countries work direct to London only, if we except Liverpool, which has direct communication with Paris, Havre and Antwerp. Consequently, while London is required to work with all these various towns, it has, on the other hand, to receive all traffic from such offices and re-transmit other than that for London. It does not seem quite consistent that, with the exceptions quoted, London should be the only town in the British Isles to which Continental cities work direct and yet has to feed France, Germany, &c., through many offices other than their capitals. It seems only fair, therefore, that direct communication between countries should be made, say, to their capitals, leaving the capitals to do their own re-transmissions to the towns in their respective countries as London is required to do for the British Isles and beyond. Unless international regulations are against this, considerable economy in staff, apparatus and lines could be obtained by direct working between capitals only, as it is obvious that the telegraph loads for the respective countries could be more economically handled between capitals than when one country is working to some 7 or 8 towns in another.

Ladies and Gentlemen, I could continue in this present strain at some length, but I do not wish to weary you. I have endeavoured to show that there is a good case for Administration and Staff alike to co-operate and do everything possible to put the Telegraph Service in such a position as to make it a revenue-earning concern. And in this connexion I feel that the Whitley machinery would prove a happy medium for co-ordination and co-operation and that much good would result if both the official and staff sides would discuss the ways and means of achieving this.

Nothing can be gained without some sacrifice. What is required is greater incentive, larger co-operation and increased output. It is true the Post Office Department as a whole yields a splendid revenue, but I feel sure that the staff of the Telegraph Service would infinitely rather that it should at least pay its way than be a dependent upon other branches of the Post Office Service for its existence.

It will, I think, be agreed that the past 56 years of Government Telegraphs provides an interesting study. During that long period the changes have been many and varied. Excellent public service has been rendered without, I fear, receiving the appreciation deserved. It is, perhaps, only in recent years that the ordinary public has been enlightened to any extent as regards telegraphy as a consequence of the introduction of wireless in the homes, and it is unfortunate for all engaged in the profession of Telegraphy that the mere sending and receipt of a telegram is looked upon by the public in little higher sense than the mere posting and receipt of a letter, except that it is more costly.

One can always be wise after an event, and there is little doubt that if the Telegraph Service was only now being established and could have the benefit of its 56 years' experience, much that has been done in the past would have remained undone. Blame for any errors of administration would be difficult to place and no useful result would now accrue were it possible to do so. The Service commenced in a small way, grew up very fast, and became exceedingly vigorous in its prime. At the present time it is in some sort of a decline and requires, perhaps, the essential tonic. If we to-night are able to provide at least one of the ingredients, our time will not have been spent in vain.

In writing this paper I have had no desire to be unduly critical of past and present methods. I have endeavoured to be strictly honest in my views both in regard to the Department which it has been my good fortune to serve for so long a period and to my colleagues of the Telegraph Service with whom it has been a pleasure to be associated. I have passed out of the Service, but I can venture the assurance that my interest in the Telegraph Service will ever be very keen.

I have every sympathy with the efforts made from time to time to obtain improved conditions of employment. Many of such efforts have been successful in the past and I think it will be agreed that there is now a vast difference in the scales of remuneration and conditions of service as compared with those when I first entered the Service. It is, however, fairly obvious that improved conditions cannot continue to be obtained while the loss on Telegraphs increases year by year, and it is therefore incumbent upon everyone connected with the Service to do all possible in his or her own interest and in the interest of the Department he or she is required to serve, to put Telegraphs on a revenue-earning basis. If anything I have advanced to-night will in any way aid the difficulties under which the Telegraph Service is labouring, I shall be the happier for it. On the other hand, if any of my suggestions may seem detrimental to the personal interests of anyone whose vocation is Telegraphy I must claim indulgence. Honesty needs no disguise nor ornament, and nothing is achieved before it is thoroughly attempted. I thank you for your patient hearing.

AUTOMATIC TELEPHONY.

BY C. W. BROWN.

(VI—*Continued from page* 246.)

IN Fig. 5 a more complicated scheme is shown. The area is assumed to contain a main exchange and four satellites of different capacities. The fig. is given to indicate the extent to which the scheme may be used and is an extension of the arrangement previously explained. Switching selector repeaters are provided at satellite No. 1 only. In the remaining cases, the satellite

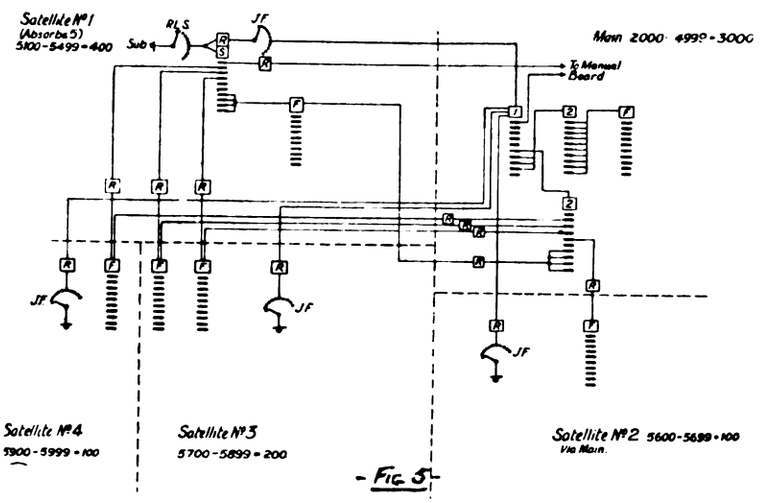

FIG 5.

exchanges route all originated traffic via the main exchange. The digit 5 is individual to the satellite exchanges, hence on the 5th level of the switching selector repeaters at satellite exchange No. 1, this digit is "absorbed" and discrimination is arranged when the digit is dialled.

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Calls from satellite No. 1 to the remaining exchanges will be routed as follows :—

Satellite No. 1 to Satellite No. 2.

The S.S.R. (switching selector repeater) and 1st selector in the main exchange rise to the 5th level, the S.S.R. releases and the 1st selector extends to a second selector. Digit 6 dialled, level 6 is disconnected on the S.S.R. which now functions as a repeater, level 6 of the main exchange 2nd selector is extended to final selectors in satellite No. 2, the tens and units digits therefore pass into a final selector in satellite No. 2.

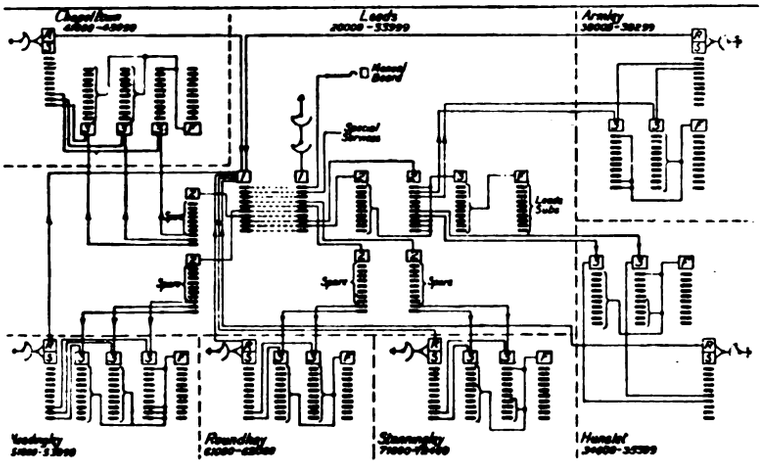
Satellite No. 1 to Satellite No. 3.

The S.S.R. and 1st selector in the main exchange rise to the 5th level, S.S.R. releases and 1st selector extends to a second selector. The next digit will be 7 or 8, and the S.S.R. wipers will enter the level and extend to a final selector in satellite No. 3. The junction to and the selectors in the main exchange are released. The S.S.R. functions as a second selector.

Satellite No. 1 to Satellite No. 4.

The operation will be similar to the above, except that the second digit is 9, from this level of the S.S.R. the caller will be extended to final selectors in satellite No. 4.

FIG. 6.



Satellite No. 1 to the Main Exchange.

The first digit will be 2, 3, or 4, so that discrimination does not occur, and the wipers of the S.S.R. remain disconnected, the call passing into the main exchange network with the S.S.R. functioning as a repeater.

It will be left to the reader to trace calls from the other exchanges, if he so desires.

That economy in switches and junctions occurs will be apparent when a discriminating scheme such as that described is applied.

The application of a discriminating scheme to a large area is shown in Fig. 6 which gives the grouping for an actual case.

The main exchange has a capacity for 14,000 lines, and the satellites are all large. In each of the satellite exchanges, switching selector repeaters are fitted and the first digit is absorbed, hence a saving of selectors results in each case, second selectors being unnecessary.

Mention has already been made of mixed four and five digit numbers. The use of four digits enables economy in selectors, and consequently four digits will be generally allocated to the main exchange and the larger satellites, five digits being used for ultimate requirements when the four digit numbers are exhausted. In any case, the use of four digits for exchanges with heavy traffic and five digits for all or part of exchanges with light traffic appears to be a sound economic basis for provision, thus such division frequently occurs in practice.

VII.

SOME indication of the limitations of multi-exchange working has already been given. The schemes mentioned cannot be economically applied to a large city, i.e., a metropolitan area, because of the special and distinctive requirements that have to be catered for in such cases. It will be apparent that in a city having a number of large exchanges, wholesale changing of numbers must, if possible, be avoided, and subscribers permitted to retain their existing numbers as far as possible. Other considerations that arise are :—

1. Dialling a large number of digits must be avoided, in order to reduce the risk of wrong numbers and to prevent imposing additional work upon subscribers.
2. A well defined junction scheme will already exist to meet manual requirements. It is unlikely that the junction scheme will fit in with the needs of a normal multi-exchange automatic system.
3. The change of system (manual to automatic) will of necessity be spread over a long period, so that for a long time manual and automatic exchanges will be simultaneously in use. The method of operating must be uniform, i.e., the automatic subscriber will obtain manual subscribers by dialling and the manual subscriber will obtain automatic subscribers with the assistance of an operator. It would be detrimental to smooth working if, after the automatic subscriber has dialled a number of digits to reach a manual subscriber, an operator should challenge with " number, please." The caller would not unreasonably resent it.

The introduction of a scheme of translation makes possible the use of standard step-by-step apparatus in the case of a metropolitan area with the minimum disturbance to the arrangements already existing.

Modern translation schemes provide facilities that include the following, and in addition can be merged into a standard step-by-step system without alteration to the fundamental switching methods :—

1. Numbering and junction routing are dissociated, thus a fully flexible trunking scheme is possible, which enables the retention of junction " lending " centres.
2. The exchanges in the automatic area may remain self-contained as regards numbering.
3. Traffic may be deflected from one route to another without difficulty, thus new exchanges may be opened up as desired.

The objection to the dialling of a large number of digits is met by using a dial that has letters as well as numbers, as shown in Fig. 1, a glance at which will show that by dialling the letters A, B or C, two impulses are transmitted, and nine impulses when the letters W, X or Y are dialled.

The dial shown in the illustration has been standardised in this country for use in areas where a translation scheme is necessary. The electrical and mechanical features are identical with those of the dial already explained, having figures only. In areas where the lettered dial is used subscribers will dial letters and figures when setting up a call, thus a portion of the call will be in letters and a portion in figures, hence the risk of errors in dialling is minimised, if not eliminated. The British Authorities have decided that the exchanges within the fee area shall be of 10,000 lines ultimate capacity, and that a " three-letter code " shall be used. Subscribers will, therefore, dial three letters followed by four numerals for regular calls, but facilities are provided for completing calls by dialling a three-letter code only in certain instances.

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It will be observed that letters are not included in the digit hole containing the digit 1. The reasons already given for the non-allocation of level 1 in a straight switching system are responsible for this feature. The letters Q and Z are not included, it being unlikely that exchange names will include these letters. In passing, it is remarked that exchange names having the initial letter O will not be used.

FIG. 1.

As there is some advantage in associating the letters dialled with exchange names, it is arranged that the three code letters shall be the first three letters of an exchange name, the directory is therefore arranged as indicated in Fig. 2, which is an extract from the London telephone directory.

As the result of the use of letters on the basis indicated, it follows that exchanges must not have names the first three letters of which will clash numerically, consequently when converting from manual to automatic working, the changing of some exchange names, even with a translational scheme, is inevitable in a very large city such as London, as the following will show :—

Exchange Name.	*Numerical equivalent of first three letters.*
Croydon	270
Bromley	270
Hampstead	426
Hammersmith	426
East	327
East Ham	327

In the foregoing cases, the name of one of the exchanges whose numerical equivalent clashes, has been changed.

A number of translational schemes are available ; that standardised by the Post Office is known as the Director system. The basic principle of the scheme provides for the conversion of the trains of impulses transmitted when the letters of an exchange name are dialled, into another combination of impulses suitable for directing the call to selectors from which junctions to the required exchange are connected ; dissociation of numbering and junctions is therefore provided. Thus the Director (this is the name given to the translator) is only in use while the call is being set up, which on an average occupies 18 seconds ; standard selector switches are used throughout the connexion.

As already mentioned, the exchanges concerned will have a four-digit numbering scheme, subscribers' numbers which have less than four digits under manual conditions will need to have one or more ciphers prefixed, thus there is a minimum disturbance to existing numbers, but in practice the prefixing of more than two ciphers will be avoided.

The use of the Director (itself a self-contained unit) has resulted in the introduction of certain additional switches. The fact that some of the impulses transmitted represent a code also introduces the expressions " code " and " numerical " with reference to the selectors operated by impulses representing code letters (exchange names) or numerals (subscribers' numbers). Thus the selectors that are operated by code impulses from the Director are recognised as " Code " selectors, and those operated by numerical impulses as " numerical " selectors.

The letters dialled by subscribers are known as the " A," " B " and " C " digits, quite irrespective of their alphabetical location, thus, in the code CRO, the letter C is the " A " digit, letter R the " B " digit and letter O the " C " digit. Of the additional switches referred to earlier there is an " A " digit selector and a BC digits selector, the latter switch is contained in the Director and forms part of it. As will no doubt have been inferred, the dialling of the first of the code letters will result in the operation of an " A " digit selector and the second and third letters a " BC " digits selector. It follows from this that if the " BC " switch is contained in the Director, the " A " digit switch will be the channel by which the Director is reached. The " A " digit selector is sometimes referred to as the Director selector.

In the London system an important additional switch is the first code selector, which is the channel through which subsequent code selectors (second, &c.) and numerical selectors are reached. The first code selector is arranged to function as a repeater on calls routed over junction routes, thus the use of separate repeaters in the junction circuits is unnecessary. Associated with the first code selector is the rotary line switch that gives access to the " A " digit switches. The relative positions of the various switches during the setting up of a call is given in Fig. 3.

King F. J. L,Elm Dene, Green E.4 .....Chingfrd 179
King & Flack,Sign, Ticket Writers,
230 Hornsey rd N.7.....NORth... 3868
King F. L, L.D.S, R.C.S.(Eng.),Dental
Surgeon,1A Peterborough rd.....HARrow.. 0119
6 Cavendish pl W.1.....MAYfair. 0541
King F. N,Limes School 13 Pk rd W.4.... CHIswick 2038
King & Fox,Billbrokers,
11 George yd E.C.3.....AVEnue.. 1454
King F. P,5 College rd Isleworth.....HOUnslow 0372
King Mrs. Frances K,
202 Marylebone rd N.W.1.....LANgham. 3254
King Francis E,26 Rotherwick rd N.W.11.SPEedwl 3776
King Francis F. & Son,Accountants &
Auditors,143 High Holborn W.C.1....MUSeum.. 2712
King Fras. J. L,17 Church hl E.17.....WALtmsto 1061
King Frank,8 Leamington gdns SevenKngsILFord.. 0077
King Frank,112 Wembley Hl rd.....WEMbley 1537
King Frank A,6 Wellmeadow rd S.E.13...LEE Gn.. 3044
King Frank E,F.I.C, Analytical Consulting
Chemist,32 Brooke st E.C.1.....HOLborn. 1832
King Frank H,6 Cromford rd S.W.18.....PUTney.. 4684

FIG. 2.

The allocation of Directors from the levels of " A " digit switches is shown in Fig. 4. As already explained, the first level is spare and consequently the " A " digit switches are arranged to release should they be irregularly operated to that level. In order to cater for " O " (operator) calls and to avoid the use of special Directors, it is arranged to use certain of the Directors of other

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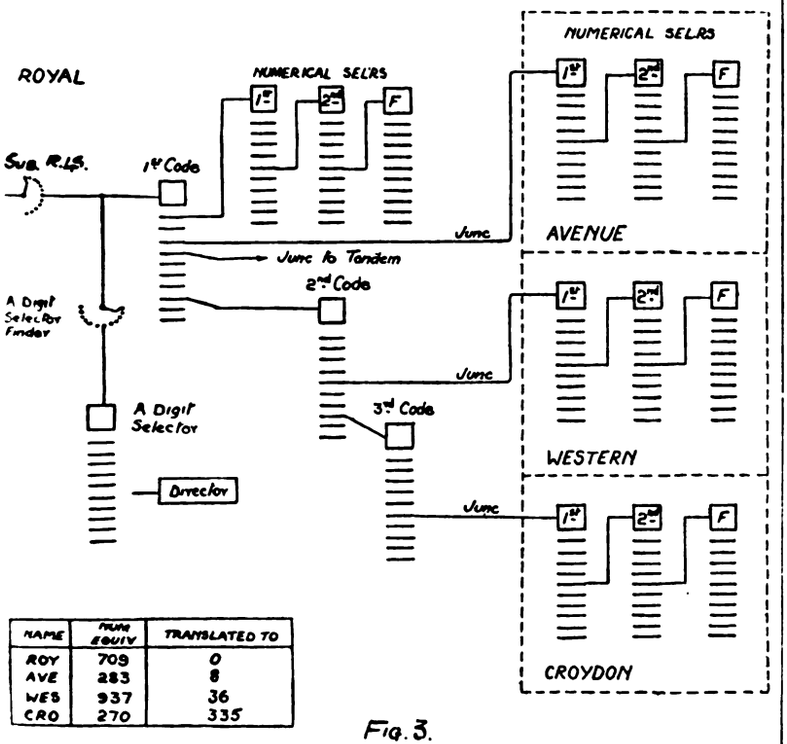
levels and to connect the " O " level bank contacts to the selected contacts of the regular levels, the Directors so used are specially equipped with apparatus—actually one additional relay only is required—for dealing with single digit calls ; the wiring connexions between the bank contacts of the " O " level and the regular levels is so arranged that the special relay will operate only when the Director is seized from the " O " level.

In addition to single digit calls, the Director is arranged to give full translation on " code only " calls, such as :—

TRU for Trunk calls.
TOL for Toll calls.
TEL for Telegram service.
DIR for Enquiry calls. The absence of the letter Q from the dial precludes the use of the code ENQ for this service.

In each of the foregoing calls the caller is routed to the relative manual position, either locally or centralised as may be necessary.

It is, of course, possible to utilise the translational scheme and dial less than three code letters ; assuming that two code letters are concerned, the " A " digit selector would be dispensed with and Directors connected direct to the bank contacts of the " A " digit finder (rotary line switch) which would then become a Director finder. On the other hand, it is unlikely that translation would be necessary with a two-letter scheme, as the area concerned would be comparatively small and it would doubtless be economical to arrange the junctions on selector levels that can be reached by direct dialling of the letters concerned, but in very large areas economy in selectors results from the use of a translation scheme. As an example, in the case of a 3-letter code scheme without



NAME	TRUNK EQUIV	TRANSLATED TO
ROY	709	0
AVE	283	8
WES	937	36
CRO	270	335

FIG. 3.

translation, apart from the inflexibility of the arrangement, a large number of code selectors will be necessary on the local level (the level via which local calls are routed) that are unnecessary when a translation scheme is used. This will be clear from Fig. 3 from which it will be seen that 2nd and 3rd code selectors are not used for local calls.

Fig. 5 is a picture of a Director, which consists of the following main items of apparatus :—

1. A " BC " selector. This is a standard two-motion switch with three pairs of wipers and three-line banks—sometimes referred to as a 600-point switch, due to the total number of contacts being 600, three banks containing 100 pairs of contacts.

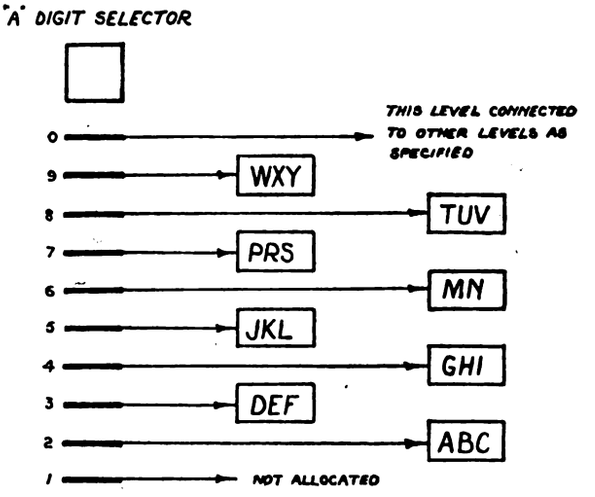


FIG. 4.

2. A digit or impulse distributor. This is either a 10-contact line switch or a " minor switch " already described. The distributor transfers the dialled impulses to the respective switch magnets and is released when the Director has fully discharged a call.

3. Four registers. These are either 10-contact line switches or " minor switches." They are operated respectively by the thousands, hundreds, tens and units trains of impulses, i.e., the called subscribers' number. The registers are released when the Director has discharged a call.

4. A sender. This is a standard 25-contact rotary line switch and bank. The sender operates—steps—while impulses are being sent out by the Director. The wipers are stepped to the bank contact corresponding to the number of impulses sent out and then return to the " home " position. The sender might be said to open and close the source of impulse supply, as the actual impulses are sent from a machine, hence the word " sender " should not be misunderstood.

5. A sender control switch. This also is a standard 25-contact rotary line switch and bank. The wipers are moved one step after each train of impulses passes out from the Director. It controls the sequence of the trains of impulses sent out by the Director.

6. A number of relays for the establishment of the many circuits, supervisory lamp, testing jack and a key complete the items.

The director has associated with it a cross-connexion field, in which the necessary connexions for translation are made. The cross-connection field will be seen at the right of Fig. 5. Fig. 6 is a diagrammatic representation of the cross-connection field and shows also the connexions for a typical translation. The six blocks of tags on the left of the Fig. are wired to the bank contacts of the BC switch. As level 1 and contacts No. 1 of each level are not used (there are no letters in the No. 1 digit hole of the

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dial, as already explained), they do not appear on the cross-connexion field. The centre group of tags numbered 1 to 6 are used for the purpose of maintaining an alphabetical sequence for exchange codes, jumper wires are connected between the BC bank contact positions (six in number) and the exchange terms tags allocated to the various exchanges. On the right are six blocks of tags numbered horizontally 1 to 0; these contacts are commoned

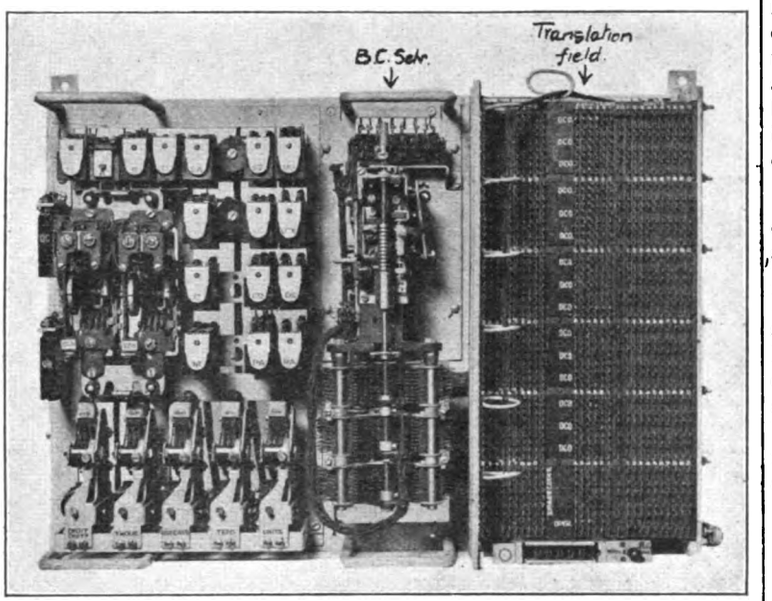

FIG. 5.

vertically and are cabled to the sender bank and also to the four register switch banks. Connexions are made between the exchange terms tags and the sender bank tags by means of short lengths of wire, as required. It will be seen that the maximum number of impulse trains that can be used for any exchange is six, but less than this number can be used. For instance, the numerical equivalent of ADDiscombe is 233, which, when dialled, will have operated the BC switch to third level and the third contact. Assuming that it is required to send out six trains of impulses to reach Addiscombe exchange, that is the junctions are located on the banks of a switch that can only be reached via five preceding switches, then it will be necessary to connect the six exchange terms tags allocated to Addiscombe to the six adjacent sender tags in such a manner that the correct trains are sent out in succession. Let it be supposed that it is necessary to send 357238, the following connexions will be required between the two groups of tags :—

Exchange terms tags.		*Adjacent sender tags.*
1	connect to	3
2	,,	5
3	,,	7
4	,,	2
5	,,	3
6	,,	8

Junctions to Addiscombe will therefore be located on the 8th level of the 6th switch ahead of the Director.

Referring again to Figs. 5 and 6, it will be observed that interspersed between the exchange terms tags are rows of tags marked DCO: this is an abbreviation for "digit cancel out." If it is not required to send out the full six trains of impulses to reach an exchange, the number short of six are cancelled. If, instead of the six trains already mentioned for reaching Addiscombe, it is only necessary to send, say, three, i.e., 357, then exchange terms tags 4, 5 and 6 will be strapped to the DCO tags immediately below them. A typical translation using two trains is given in Fig. 6. In passing, it is mentioned that the impulses transmitted from the Director are standard, i.e., the break-to-make ratio is 2 : 1, and are derived from machine operated cams.

In order to reduce the holding time of A digit selectors and Directors to a minimum, the circuits are so arranged that upon the receipt, in the Director, of the C digit, sending of the translated code impulses commences, the calling party will be dialling the numerals of the wanted subscriber at the same time, so that, assuming the call is proceeding normally, the code selectors are being set up to extend the connexion to the numerical selectors in the required exchange, without waiting for the whole of the call to be received in the Director.

The number of exchanges that can be reached from a Director on a three-letter code basis is 81. This will be clear when it is appreciated that the number of possible positions to which the BC switch wipers can be directed is 81, i.e., 9 levels of 9 contacts. It is unlikely that such a large number of exchanges per A digit switch level will be required, hence, the cross-connexion field of Directors is constructed to accommodate 54 exchanges, i.e., by eliminating the special tags (DCO and Operator) there will be available for exchange terms, six blocks of 9 sets of tags, i.e., 54. Without disturbing the special tag allocation, there is capacity for 35 exchanges, which in the case of London is expected to meet all requirements.

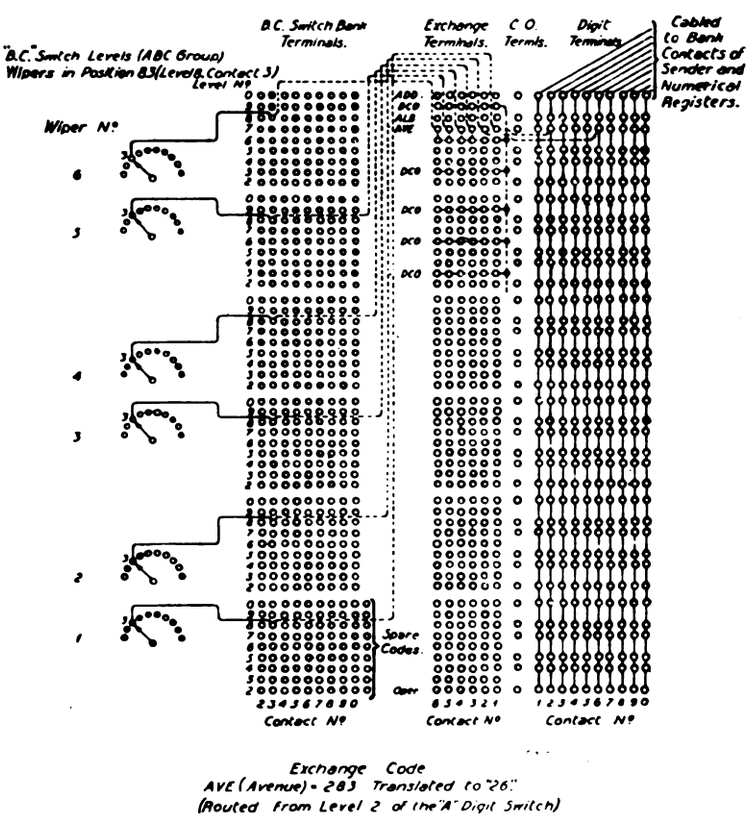

FIG. 6.

It follows from the foregoing that the number of exchanges that can be reached by a caller will be determined by the number of levels available on the A digit switch; these are eight in number (levels 1 and 0 are not used for A digits) and as the level capacity is 81, the theoretical capacity of A digit switches is 81 by 8, i.e., 648 exchanges. Even after excluding combinations that would

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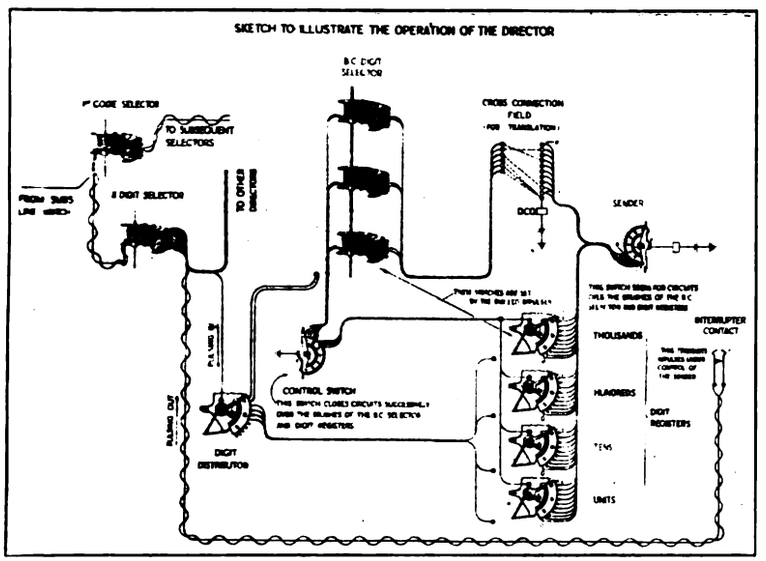

FIG. 7.

not normally be used, it will be seen that a very large number of exchanges can be catered for under translational conditions.

The situation of A digit switches and Directors in a "bottle-neck" makes it necessary to provide adequate safeguards against "blocking" channels due to the existence of abnormal conditions. The following summary indicates the facilities provided accordingly :—

Nature of abnormal condition.	*Resultant effect.*
1. Sub. removes receiver but delays to dial—or a fault occurs that extends a sub.'s line to an A. digit switch.	A digit switch released after 29-59 seconds. If dial is operated, caller receives N.U. tone.
2. Director seized, but sub. delays to dial remainder of call, or Director operated and sub. delays.	A digit switch and Director released after 29-59 seconds. Caller receives N.U. tone. All switches set up beyond the 1st code selector are released.
3. Impulsing springs of Director faulty.	Director released and made "busy." Director supervisory lamp flashes at 0.75 seconds intervals. Audible alarm given.
4. Director fails to release after discharging a call.	A digit switch released and caller receives N.U. tone. Director made "busy" lamp flashes as above, audible alarm given.
5. Sub. dials prematurely ...	Receives N.U. tone.

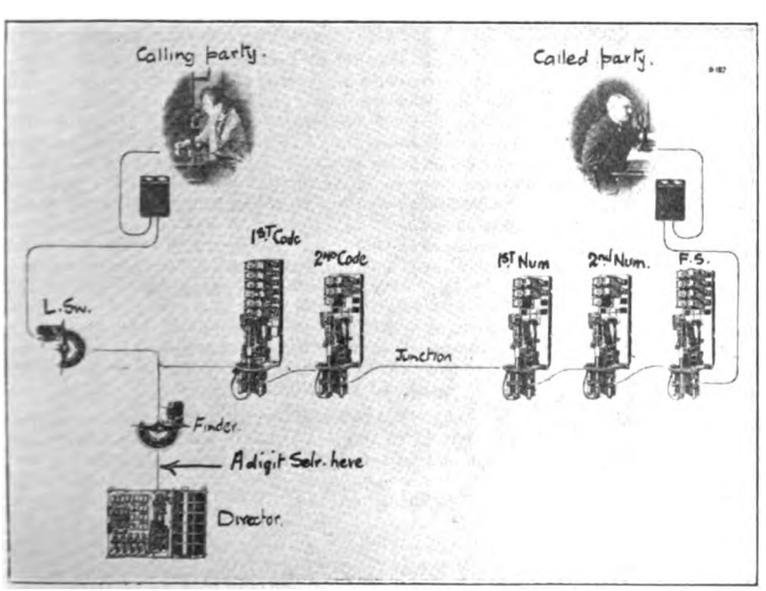

FIG. 8.

Figs. 7 and 8 show the position occupied by the various switches involved in the setting up of calls under the translational conditions adopted by the Post Office.

(To be continued.)

EXTENSIONS OF THE ANGLO-CONTINENTAL TELEPHONE SERVICES TO NORWAY AND OF THE TRANSATLANTIC SERVICE TO CANADA.

As we go to press, we learn that telephone service will be opened between the London district and Oslo (NORWAY) on Oct. 1. The charges for a unit call of 3 minutes will be £1 2*s*. 6*d*. from 8 a.m. to 9 p.m., and 13*s*. 6*d*. from 9 p.m. to 8 a.m.

On Oct. 3 telephone service will be opened between the hours of 12.30 and 11 p.m. (British time) between the London Telephone Area and Ottawa, Quebec, Montreal, Toronto, and Hamilton (Ontario) in CANADA. The charge for a 3-minute call will be £15, and £5 for each additional minute or part thereof.

"THE G.P.O. PLAYERS" DRAMATIC SOCIETY.

THIS Society is presenting Karel Capek's R. U. R. ("Rossum's Universal Robots") at King George's Hall, Caroline Street, Great Russell Street, W.C. (two minutes from Tottenham Court Road Station), on Friday and Saturday, Oct. 28 and 29, 1927, commencing at 7.30 p.m. The play is being produced by Major H. Hodgson-Bentley (founder and director, Southend Repertory Theatre). The prices of admission are: Orchestra Stalls, 5*s*. 9*d*. and 3*s*. 6*d*.; Circle, 3*s*. 6*d*., 2*s*. 4*d*., 1*s*. 6*d*.; Pit Stalls, 2*s*. 4*d*. and 1*s*. 6*d*.; including tax. Tickets may be obtained from any member of the Society or from the Honorary Secretary, Mr. C. N. J. Leigh, Room 12, Third Floor, G.P.O. North, E.C.1.

THE EARLY DAYS OF THE TELEPHONE.

IT is interesting to see how little impression the telephone made on people when it was introduced here fifty years ago, says the *Manchester Guardian*. Lady Frederick Cavendish has two casual references to it in her recently published diaries, but she herself does not seem to have taken it seriously at first. When staying at Battle Abbey in February, 1878, she notes: "Sun. evening a wretched new craze called a telephone was brought into play, and F. kept at work shouting down it for a long time: on the whole a failure." That she became more reconciled to it seems evident, however, for, the second time it is mentioned (in 1881) is in less unflattering terms. "That enchanting new marvel, a *telephone*, has been put up, whereby Castle and Rectory converse *ad libitum*. Uncle W., who is in some respects the greatest Tory out, will have nothing to say to it." This was at Hawarden, and "Uncle W.," of course, Mr. Gladstone.

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BLOOMSBURY AND ITS KIOSKS.

BLOOMSBURY has been subjected to as many cheap and pointless witticisms as the town of Wigan, the inhabitants of Aberdeen, and mothers-in-law.

At first glance it is not easy to understand why the district should be chosen from among the residential neighbourhoods of London to be the target of the flippant attack and the threadbare gibe. It is an accessible and, in many respects, a desirable district in which to live. It has wide squares and spacious thoroughfares. It possesses streets of dignified Georgian and Early Victorian houses. It contains the British Museum—the grandest concentration in the world, as Ruskin tells us, of the means of human knowledge—University College, and many other educational and literary institutions. Authors, artists and members of Parliament live in it. It may fairly lay claim to an atmosphere of culture superior to that enjoyed by any other locality in London. Lastly, it stands on high ground and is healthy in consequence.

In proportion to its size Bloomsbury contains more boarding and apartment houses than any other locality or town. Due to the fact that all three great railway routes from the north terminate on its fringe, these houses are much frequented by visitors from Lancashire, Yorkshire and Scotland, and, as such visitors have little difficulty in more than holding their own when it comes to a question of bargaining, the prices charged for accommodation and food have become more or less stabilised at moderate levels. Probably it is this fact—for Bloomsbury is known to the outside world, not by its squares and gardens and colleges, but by its boarding houses—that has given rise to the prevailing impression that it is a second-rate neighbourhood, a rather cheap, rather tawdry, neighbourhood, a shabbily genteel neighbourhood, a dowdy and frowsy neighbourhood, a neighbourhood which stands relatively to other parts of London as, shall we say, Southend-on-Sea to the general run of seaside resorts. People who write books refer to it in apologetic, if not actually slighting, terms. In plays it is invariably held up to invidious remark. "They call the place where I live 'Bloomsbury,' the old second-hand bookseller in "Liberty Hall" says, in disgruntled tones which in themselves constitute a libel on the neighbourhood. "They call my 'ouse a ramblin' one," he goes on to say, "though why it ain't rambled away to some nicer place, I can't think."

It may be as well to explain, before passing on to the subject of the kiosks, that there are two Bloomsburys, not one, as is generally supposed. The first, the better Bloomsbury, lies on the western side, between those two great avenues of traffic known as Tottenham Court Road and Southampton Row. It contains many beautiful and imposing squares, of which Bedford and Russell Square are the best known. The second Bloomsbury lies between Southampton Row and Gray's Inn Road. It is, it must be admitted, a shabbier Bloomsbury. It is a poor relation of the other Bloomsbury. Pre-eminent in it is Mecklenburgh Square, preserving a calm, collegiate air amid surroundings from which the old-time quiet dignity and charm have departed. The inhabitants of the square will tell you that the neighbourhood is not what it was. But then, according to the people who live there, no neighbourhood ever is what it was.

The best point to start for a walk through Bloomsbury is from King's Cross, the north-eastern corner of the lesser Bloomsbury. It is the best, I mean, from the point of view of kiosks, for there, almost immediately opposite the great towers of St. Pancras Station, which rises out from its drab surroundings like a cathedral,, with arched windows, turrets and belfry complete, boldly, and almost impudently facing it, are two—two—of the Gilbert Scott kiosks. It is well to stress the number because, of the six hundred kiosk sites in London, not more than a dozen are group sites, sites, that is to say, each of which accommodates two or more kiosks. At the moment of writing I can recall eleven group sites—there may be one or two more. They are the sites at the Giltspur Street side of St. Martins-le Grand, the Law Courts in the Strand, Mount Pleasant, the Embankment beside Telephone House, Vere Street in Mayfair, Sloane Square and World's End in Chelsea, Portland Street Station, Church End Finchley, Acton (the Mount), and this one at King's Cross. Here we started with one in September, 1926. Eight months later we added the second. There is no reason why we should not go on adding. The pavement is extraordinarily wide—thirty feet or thereabouts between the kerb and the building line—there is room for more, and there is a steadily increasing demand for the facilities afforded.

The site of the next kiosk in the list is not quite so prominent. It is further along Euston Road—half a mile or so. It stands at the end of a quiet street called Churchway, and faces St. Pancras Church. "There," I said to Barling—I was referring to the church—"is a disappointing work of art." Oh—I don't think I mentioned that Barling accompanied me on this walk. Barling is much interested in kiosks and, when he heard of my projected tour, he asked to be allowed to join. I could hardly refuse—not, of course, that I wanted to. You will want to know something about him. There are five departments of the Post Office, in addition to the London Telephone Service, which have to do with kiosks in some way or another—the Secretariat, the Accountant-General's Office, the Engineering Branch, the Stores Department, and—when it is proposed to erect a kiosk outside a Post Office—the Postal Service, and Barling is in one of these Departments. He is slightly above middle height, on the lean side, with a pale, intellectual cast of face, and slightly rounded shoulders. His hobbies are architecture and golf. He is by way of being an authority on ecclesiastical architecture, and has played golf patiently for a long number of years without having attained more than a humdrum efficiency in the game—his handicap is fifteen. He has a curious habit of wearing horn-rimmed spectacles out of doors, invariably wears suits of a slate-coloured material, and, for some reason which I have never been able to divine, still adheres to the double-breasted jacket. That is all, I think, I need say about Barling—at the moment, anyhow.

"It is handicapped by its surroundings," Barling observed, in reply to my remark. He went on to furnish quite a lot of interesting information about the church, to which, although I recognise that it is incumbent for a description of kiosk positions to take cognizance of the nature and purpose of neighbouring buildings, I am unable to make more than very brief reference here. I gathered that it was the first church in this country to be fashioned after the strict Grecian style, being modelled after one of the Athenian Temples. The pillars of the portico, Barling admitted, were ponderous and rather depressing, and the net result of the building of the church, he said, was a strong reaction in favour of the Gothic style. In sharp contrast, a little further away, stood a cool, grey, brick building, with a Doric portico facing the road. "The newly erected headquarters of the Society of Friends," Barling explained, "and the building which was awarded the medal of the Royal Institute of British Architects for the best London building of the year." I glanced at it with added interest. There was something of the Quaker lady about its look of grey composure and prim charm.

The next kiosk in the list was one in Tottenham Court Road, along which busy thoroughfare we turned a little further west. At its junction with Euston Road—a rather congested spot at which we have tried hard to find a site for a kiosk—stands the Adam and Eve tavern, interesting because it is the inn shown in Hogarth's celebrated "March to Finchley," a picture which may be seen in the picture gallery at the Foundling Hospital. The original inn is said to have been built on the site of a structure known locally as King John's Palace, though whether that unfortunate monarch ever lived there is open to question. Not much more than a century ago, a fact of interest to students of town development, the inn was quite a rural one, surrounded by gardens, a popular resort of jaded Londoners out for a walk into the country, and "Tothnam Court," which gave its name to the street, was originally a quiet secluded manor in the fields.

The Tottenham Court Road kiosk is hard by the Whitefield Memorial Church, a conspicuous red brick edifice, built on the site of the chapel put up by George Whitefield. The kiosk stands by the gate of what used to be the churchyard, but is now a public garden. Less than half the size of the Postman's Park, it is probably the smallest of the parks or open spaces under the jurisdiction of the London County Council. The immediate neighbourhood of the kiosk is rather dingy. Tottenham Court Road itself is not an inspiring street. It possesses neither the atmosphere of the city nor yet the repose of the West End. It has been described in many ways—mostly uncomplimentary. It is a street of varying widths of pavement. For irregularity of building line, the west side of the road is hard to beat among London streets. The pavement varies in width from a few feet to twenty and it reaches its widest point where the kiosk stands. While I think of it, Barling, whose memory for these things is a continual source of wonder to me, mentioned that the original building of the famous old dissenting place of worship, built in 1756, was pulled down in 1890 to give place to the present building, but that the pulpit in which Whitefield—and also John Wesley—preached was still in existence.

To reach the next kiosk in the series we turned east to Southampton Row. The intervening territory is at present kiosk-less, but two sites have recently been obtained, one outside the Museum Exchange in Chenies Street, and another in Store Street, in front of a large building housing the staff of one of the big Oxford Street drapery firms. Both these streets turn off Tottenham Court Road.

The Southampton Row kiosk stands on private property at the end of Sicilian Avenue, a short modern arcade or, rather, colonnade, with a marble slabbed floor and some dozen shops of the bijou type on each of its two sides, connecting Bloomsbury Square with Southampton Row. It is closed to the public on one day of each year. The distance to the junction of Southampton Row and Holborn—from which the kiosk is plainly visible—is a hundred yards. The site is a good one and another kiosk about here—possibly at the other end of the short avenue, although preferably standing side by side with the existing structure—may mature as soon as shopkeepers and frontagers realise that the facilities constitute an asset to their neighbourhood. In this connexion I spoke—soon after the present kiosk was put up—to the proprietor of a small restaurant in the area of influence. He was doubtful about the effect of the kiosk, guarded in his utterances. His wife was more outspoken. "It looks pretty when it's lit up," she said. It was not much but it was something—the Post Office get few bouquets of any kind nowadays. It indicated—although the reason given was not too substantial—that in this matter of the kiosk she had ranged herself on our side.

A few minutes' walk along Theobalds Road, a congested, irregular, tram-lined thoroughfare, brought us to the last kiosk in the series. It stands prominently at the north end of Bedford Row, a fine, wide, Georgian street with a pronounced legal atmosphere—it is, indeed, now tenanted almost entirely by solicitors. Ask any half-dozen men with a fair knowledge of London why Bedford Row is so called. Each will tell you that it is because the Duke of Bedford is the ground landlord. That ought not to be wrong, but it is! In the seventeenth century a Bedford boy—Harpur by name—came to town, made a fortune, became Lord Mayor, and left ten acres of meadow land north of Holborn for the benefit of his native town. Hence the Harpur Trust, hence the famous Bedford School, and hence—Bedford Row.

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The Row, which has several curious old passages leading into Holborn from the other end, flanks the western side of Gray's Inn, the most northerly of the four Inns of Court, described by Hawthorne as "a large, quiet domain close beside Holborn, with a large space of green sward enclosed within it."

The territory covered by Gray's Inn, which takes up the whole of this south-eastern corner of Bloomsbury—some writers will have it that Bloomsbury stops just short of the Inn—is at the moment unrelieved by the hospitable colouring of a Gilbert Scott kiosk. It is good to know that this reproach will shortly be removed, certain scruples on the part of the Benchers having been overcome, and that in the near future one of the familiar structures will be erected on the northern side of the Inn. Enter the Inn from Holborn, and you will emerge into the first and smaller of the two squares, the one containing the statue to Bacon. Do not take the opening leading through the archway at the end of the Chapel, which will take you into a second and larger square called Gray's Inn Square, but turn to the left, through the narrow passage at the north-west corner. You will come out into Field Court, with the large garden on your right. On the west side of the garden, at the northern end, you will see a block of buildings. In front of these, which are known as Raymond Buildings, will stand the kiosk.

Oh, before I close, I ought to mention that Barling had quite a lot to say about Gray's Inn. The Inn, he recalled, had been in existence as a School of Law since 1371. Bacon was its most illustrious member, and its Treasurer for nine years (1608-1617). Other eminent members were Thomas Cromwell, Archbishop Laud, and Burleigh. Bacon, whose memory is preserved in the name—Verulam Buildings—given to a block on the Gray's Inn Road side, planted some elm trees in the garden. With their disappearance—they have within recent years been superseded by planes—is said to have gone the last rookery in the middle of London. The spacious garden, no longer open to the public, was a fashionable resort during the seventeenth century, a fact to which, Barling thought, Pepys makes reference in his diary.

Barling's memory is pretty sound on points such as these, but, to make sure about the last item, I turned up my copy of Pepys when I got home. Barling was right—several entries in its pages showed that Gray's Inn Walk, a pleasant avenue through the gardens, was a favourite walk of the notorious gossip. Sometimes he was accompanied by his wife. More often, it would appear, he went alone. The earliest of the entries states that he went "after dinner to Graye's Inn Walk, all alone, and with great pleasure seeing the fine ladies walk there." Some time later Samuel appears to have gone to the same spot, this time with his wife, "to observe the fashions of the ladies, because of my wife making some clothes." Further on in the diary there is yet another entry. "Beside the sermon I was very well pleased with the sight of a fine lady that I have often seen walk in Graye's Inn Walk, and very pretty and sprightly she is."

C. W. M.

GUILDFORD.

THE Second Annual Cricket Match between the Guildford and Reading District Managers' Staffs was played on the Sports Ground, Guildford, on Sept. 3, and a most enjoyable game ended in a victory for the Guildford staff by 59 runs. The Reading staff took first knock but could not withstand the bowling of Stewart and Plant, the former taking 6 wickets for 12 runs and the latter 4 for 8, all being out for 25 runs. The Guildford innings reached a total of 84, Garrood 23, Ballam 18, and Stewart 16, being the chief scorers.

During the interval tea was partaken of when over 70 members and friends were entertained.

Reading Team.			*Guildford Team.*		
Luscombe, b. Stewart	...	0	Plant, c. Parsons, b. Beesley	...	12
Bradley, b. Stewart	...	1	Stewart, c. Luscombe, b. Beesley		16
Werry, b. Stewart	...	0	Freeman, c. Drescher, b. Miller	...	3
Beesley, b. Stewart	...	0	Ballam, b. Miller	...	18
Miller, b. Plant ...	...	1	Garrood, run out	...	23
Drescher, b. Plant	...	2	Turner, b. Beesley	...	2
Leeke, b. Stewart	...	5	Bartleet, c. Lane, b. Bradley	...	0
Parsons, b. Plant ...	...	0	Combes, c. Werry, b. Lane	...	2
Amey, b. Stewart	...	10	Bald, c. Bradley, b. Beesley	...	2
Stevens, b. Plant ...	...	0	Bayley, c. Bradley, b. Werry	...	0
Lane, not out ...	...	1	Gardner, not out	...	0
Extras	...	5	Extras	...	6
		25			84

RETIREMENT OF MR. WATERSTON.

JAS. A. WATERSTON, Head Postmaster of Evesham, who retires on the 16th inst., took first place at Open Competitive Examination in London in December, 1881, and was appointed 2nd Class Telegraphist in April, 1882, at the age of 14 years 6 months. He has been successively Head Postmaster of Glossop, Maldon and Evesham. Retires, at the age limit, after 45 years 6 months established service.

PROGRESS OF THE TELEPHONE SYSTEM.

THE total number of telephone stations in the Post Office system at July 31, 1927, was 1,548,716. The new stations added during July numbered 20,154 and the cessations 13,708, resulting in a net increase of 6,446 stations.

The growth for the month is summarised below:—

	London.	Provinces.
Telephone Stations—		
Total at July 31	547,238	1,001,478
Net increase for month	2,325	4,121
Residence Rate Subscribers—		
Total	120,458	195,061
Net increase	787	1,467
Call Office Stations—		
Total	4,843	17,771
Net increase	14	105
Kiosks—		
Total	576	2,964
Net increase	11	64
Rural Party Line Stations—		
Total	—	10,020
Net increase	—	—
Rural Railway Stations connected with Exchange System —		
Total	—	796
Net increase	—	13

The number of inland trunk calls dealt with during June (the latest statistics available) was 8,462,399, an increase of 377,625, or 4.7%, on the figure for the corresponding month last year.

Calls made to the Continent during June numbered 25,937 and from the Continent 27,707.

Further progress was made during the month of August with the development of the local exchange system. New Exchanges opened included the following:—

LONDON—Tandem Junction Switching Exchange (preliminary position).

PROVINCES—Burnley (automatic).

And among the more important exchanges extended were:—

LONDON—Buckhurst, Clissold, Finchley, Mount View.

PROVINCES—Birmingham (Western), Birmingham (Victoria), Colwyn Bay, Hanley, Liverpool (Waterloo), Slough, Smethwick, Wokingham.

During the month the following additions to the main underground system were completed and brought into use:—

Tonypandy—Pentre,
Chester—Hawarden,
London—Dorking,
Junction Hengoed—Bargoed,

while 67 new overhead trunk circuits were completed, and 74 additional circuits were provided by means of spare wires in underground cables.

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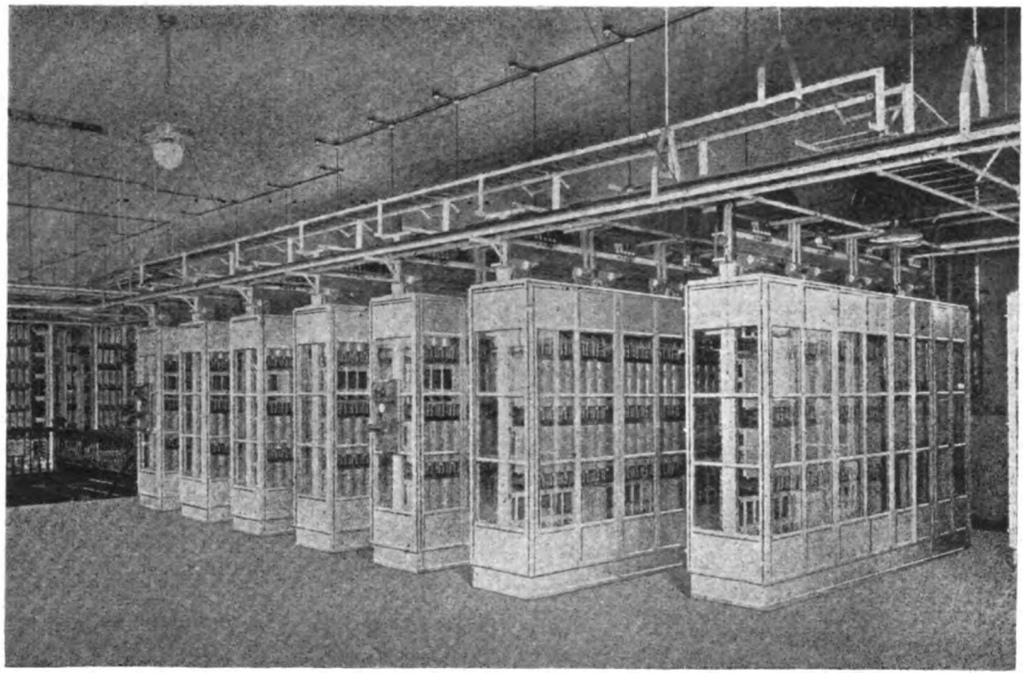

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TELEPHONE

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STROWGER Automatic Telephone equipment has an inherently long life. This is due not only to manufacturing precision and careful inspection of raw material and finished product, but also to a design that permits of easy growth, expansion and increased traffic as changing conditions may require.

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EQUIPMENT

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The
Telegraph and Telephone Journal.

PUBLISHED MONTHLY IN THE INTERESTS OF THE TELEGRAPH AND TELEPHONE SERVICE, UNDER THE PATRONAGE OF THE POSTMASTER-GENERAL.

Editing and Organising Committee - - - J. STUART JONES. W. D. SHARP. J. F. STIRLING. W. A. VALENTINE. J. W. WISSENDEN.

Managing Editor - - - W. H. GUNSTON.

NOTICES.

As the object of the JOURNAL *is the interchange of information on all subjects affecting the Telegraph and Telephone Service, the Managing Editor will be glad to consider contributions, and all communications together with photographs, diagrams, or other illustrations, should be addressed to him at the G.P.O. North, London, E.C.*1. *The Managing Editor will not be responsible for any manuscripts which he finds himself unable to use, but he will take the utmost care to return such manuscripts as promptly as possible. Photographs illustrating accepted articles will be returned if desired.*

VOL. XIV. OCTOBER, 1927. No. 151.

TELEGRAPH DEVELOPMENT.

THE statistics for 1925, just published by the International Bureau of Berne, show, despite the more rapid development of the telephone system, what a very considerable part the telegraph service plays in the communications of the world. Great Britain's route mileage has increased during the year from 166 to 177 thousand kilometres, and her mileage of wire from 439 to 447. That of France has increased from 212 to 224 thousand kilometres of route and from 820 to 845 thousand kilometres of wire. Germany's total length of route has decreased slightly to 222 thousand kilometres, while her development of wire has risen from 3,064 thousand to 3,537. Russia possesses over 623, Italy 364, and Japan 283 thousand kilometres of telegraph wire.

Turning to the traffic handled, we find that 49.7 million inland telegrams were dealt with in Great Britain, and 40.1 in France (representing a decrease of about 2 million in each case) while 32.8 million were despatched in Germany, an increase of 2½ million. Over 67 million were despatched in Japan, 20 in Russia and 26.8 million in Italy, representing an increase of 8 and 3 millions respectively.

International traffic has risen in Great Britain and in Germany to upwards of 27.4 and 17.4 million messages respectively, forming, in both of these countries, more than one-third of the total handled. Last year's increase in Great Britain amounted to over half a million messages. France dealt with 14½ million such messages, Czecho-Slovakia with 11 million, Italy with 7.25 million, Switzerland with 5.1 million, Sweden with 3.7 million, Poland and Norway with over 2 million, and Japan with 2½ million. It is interesting to note that in some States the international traffic is considerably heavier than the internal traffic. In Denmark, for example, there were 3.6 international telegrams to 1.3 internal, in Holland 6.3 to 2.5, in Sweden 3.7 to 2.9 and in Switzerland 5.1 to 1.3—all these figures representing millions of messages. In the Czecho-Slovakia service there were actually over 11 million international messages to 3.4 million inland, and in that of the Free city of Danzig 1,592,957 to 128,263 ! In some countries, too, the transit messages exceed in number those originating in or destined for their own people, Czecho-Slovakia, owing to its geographical position between Germany and the North and Austria and the South, having transmitted over 8 million telegrams across its territory from one foreign State to another.

The statistics dealing with apparatus show a general preponderance of Morse and sounder instruments, with telephones as a good second. Indeed, in Germany the first-named number 9,498 and the telephones employed in telegraph work 35,479. In France the figures are 18,474 and 8,901 respectively, in Great Britain 6,921 and 11,853, in Italy 12,683 and 779, in Japan 6,235 and 2,772, in Poland 1,996 and 2,197, and in Russia 7,134 and 739. Telegraph enthusiasts will gather from the formidable figures of mileage and traffic which we have cited that in Europe and Asia the elder of the electrical services is still a growing concern, and that for long-distance messages especially its sphere of usefulness is undiminished.

HIC ET UBIQUE.

WE have received from the Northampton Polytechnic Institute, St. John Street, E.C.1, a booklet of excerpts from announcements for the session 1927-28, giving particulars of evening classes in civil and mechanical engineering.

The courses comprise: Mechanical Engineering, Civil and Structural Engineering, University Degree Course in Engineering, Automobile Engineering, Aeronautical Engineering, Engineering Workshop Course, Pattern Making, Moulding (Brass and Iron), Brass Finishing, Smithing, Die Sinking and Press Tool Making, Oxy-Acetylene Welding and Cutting, and Scale Making.

The Institute, which is well known to our London readers, was open for enrolment from Sept. 19, and the classes commenced on the 26th.

Under the heading "Tele-talkative America," the *Electrical Review* says: "Statistics published by the American Telephone and Telegraph Company show that the telephone user in the United States makes an average of 191 calls each year, whereas the English subscriber makes an average of only 23 calls. Thus, in six weeks the American gets as much value from his telephone as the Englishman gets in twelve months.

"Tele-Talkative" is about the root of the matter. Does the number of calls always represent the value of the telephone ? If a man has but 1 yearly call for his doctor or 1 call in five years

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for the fire brigade, he will still value the telephone because of the sense of security and the feeling of its availability.

The following reports, mostly from the *Electrical Review*, indicate the development of long-distance telephony which is proceeding in all parts of the world :—

JUGO-SLAVIA.—The Jugo Slavian Government propose to lay a series of new telephone trunk cables to link up important centres in different parts of the country, and to increase the facilities for conversation with important cities abroad, such as Vienna, Budapest, Prague, Brunn, and others. The main trunk lines to be established are four in number: one from Belgrade to Subotica and Horgos, on the Hungarian frontier; the second between Ruma, Brod and Zagreb; the third from Zagreb via Sevinca to Maribor and the Austrian frontier, and the fourth between Belgrade and Nish.

RUSSIA.—The Mukden and Soviet authorities have concluded agreements for providing long-distance telephone services between Harbin and Chita, and Harbin and Vladivostock. The total cost is estimated at $1,500,000, which will be borne equally by the Russian and Mukden authorities.

According to the *Financial Times*, a telephone cable service between Berlin and Moscow is to begin next autumn.

FRANCE.—The recent inauguration of telephone cables between Selestat and Basle and between Strasburg and Appenweier marks the completion of the underground system connecting Paris with eastern France and with European central and eastern countries. The Paris-Nancy underground cable, with an extension via Strasburg and Mulhouse, has also been linked up with the German underground system and with the Swiss system, with the result that Paris can now be quickly connected up to Luxemburg, the Saar district of Germany, and with Italy.

AUSTRIA.—Following the completion of the long-distance telephone line between Vienna and Passau, work is now in hand on the establishment of similar lines between Halbthurn, Vienna, Linz, Salzburg, Landeck, and the Swiss frontier, and between Innsbruck and Scharnitz Innsbruck and Brenner, and Brenner, and Wörgl and Zell-am-See.

BELGIUM.—As a result of the recent completion of the laying of underground telephone cables Brussels is now in telephonic communication with Berlin, Frankfort-on-Main, and Vienna. Antwerp is also now connected up with Berlin and Hamburg.

BRAZIL.—The Brazilian Telephone Company has now established interurban communication between most of the important cities and towns in the States of Rio de Janeiro, Sao Paulo, and South of Minas.

The following letter from a lady was recently received in the Secretary's office :—

Could you please oblige me by informing me the cost of a telephone directory (for Canterbury and District) dated 1830 to 1835.

This goes to show that many people fail to appreciate that so widespread an institution as the telephone was unheard of in this country before 1876.

In a letter to the *Spectator*, Mr. A. R. Kimball says :—

"Will you permit an old-time American reader, for the moment a visitor in London, to call your attention to the fact that in the States there are many more motor-cars owned than telephones? I have just received from the Bureau of the American Census significant figures. During the year 1926 there were registered 22,001,393 individually and commercially owned motor vehicles of every description.

"The most recent statistics available for the calendar year 1922, show that at that time there were 14,347,395 telephones in use. [There are now 17¾ million.—EDITOR.]

"Perhaps the explanation of the fact that Americans have so many more motor vehicles, a luxury, than telephones, which many would regard as a necessity, is due to the extensive advertising of motor-cars as contrasted with the entire absence of advertising of telephones."

We rub our eyes, thinking at first that the writer is complaining of the alleged absence of advertising telephones in this country. We wonder what our friends, the A.T. & T. Co., think of this allegation.

An enquirer asks whether the proper function of the carbon granules in a telephone transmitter is that of rectifier, and, if so, whether it will convert an irritable "go to blazes" into the more formal and placid "sorry you have been ter-r-roubled." There is no prize for solving this conundrum!

The opening of Daventry Junior and the closing of the Birmingham Broadcasting Station by the B.B.C. has not pleased everybody. The chief difficulties of those in central Birmingham are due to inefficient receiving sets. We have it from Capt. Eckersley himself that on investigation of the complaint of one prominent resident, the troubles were traced consecutively to the use of an iron wire aerial, to a "flex" earth one wire only of which adhered to the water pipe, to a gap between the "cat's whisker" and its holder, to a variometer with a rotating knob and immovable works, and to inefficient headphones. That this contraption ever afforded reception of the Birmingham Station was indeed a miracle!

According to the *Times*, the automatic telephone service in Prague, inaugurated last year, now comprises 30,399 subscribers, and further extensions are planned. The service is working satisfactorily.

KINDNESS TO MACHINES.

By an unfortunate printer's error the second stanza of the verses published last month under this title was made to commence "Engines, automatic," which spoiled both the sense and the metre. The line should read :—

Engines, automata, are found to be
Amenable, &c.

A critic has pointed out that a calculagraph merely registers the time of calls but does not multiply. But it was only suggested that there is no knowing what a semi-sentient machine (*pace* Signor Azari) might not do if properly coaxed.

REVIEW.

"*Easy Lessons in Wireless.*" *By Robert W. Hutchinson, M.Sc., A.M.I.E.E. (The University Tutorial Press, Ltd., High Street, New Oxford Street, W.C. Price* 1*s.* 6*d.*)

This book, which is designed for the information of those possessing little or no technical knowledge of electricity and magnetism, is couched in simple language and, though based on sound scientific principles, carefully avoids the heavy reading and mathematical expositions so confusing to the beginner. It is written by a man who fully understands the art of imparting knowledge, and it can be recommended confidently to those on the threshold of the fascinating study of wireless.

THE RELAY AUTOMATIC TELEPHONE COMPANY LIMITED.

THIS company recently secured, in open tender, two important railway contracts.

The London & North Eastern Railway have placed a contract with them to replace the existing manual telephone system at King's Cross and Liverpool Street, and link up Marylebone with the new automatic system. The installation will be of the Relay P.A.B.X. type, and will follow the standard G.P.O. practice of giving conversations from the manual and automatic exchanges over the same lines.

The other contract is one placed with them by the Great Indian Peninsular Railway for the automatisation of its system into one network of interconnected exchanges, some of which are several hundred miles apart.

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TELEGRAPHIC MEMORABILIA.

AUSTRALIA.—In the Australian Courts recently the Associated Telephone and Telegraph Co. (United States) applied for the extension, by 3½ years, of nine patents relating to automatic telephony, on account of loss incurred by reason of the war. Five of the patents were given a 2½-years' extension, but the applications in connection with the others were rejected.

We are informed that the first attempt to broadcast to the Empire from Australia was made on Sept. 4, from the Sydney station 2FC. The programme was received by the B.B.C. at the Keston station and relayed to all stations with excellent results, but for further information, reference should be made to the notes under Great Britain.

BULGARIA.—The preliminary contract for the erection of a wireless station at Sofia has been signed. The contract calls for the erection of two transmitting sets, one capable of communicating with London, and the other with Vienna, the latter to be telephonic as well as telegraphic. The receiving set is to be capable of picking up messages from any part of Europe. The cost of installation is to be approximately $2,400,000, and the contract specifies that the plant is to be in operation by May 16, 1928.

CANADA.—*Radio Development.*—A Reuter message from Ottawa states that every thirtieth Canadian owns a wireless receiving set, according to official figures. There are 55 broadcasting stations in the Dominion, and, in addition, the Government has established a chain of 48 coastal and lake transmitting stations as aids to navigation on the Pacific and Atlantic Oceans and the Great Lakes.

CZECHO-SLOVAKIA.—Radio apparatus was a special feature of the Sample Fair at Prague, held from Sept. 18 to 25. More than 80 foreign and home firms manufacturing and dealing in radio apparatus were represented in the section.

DENMARK.—Reuter's Copenhagen correspondent reports that the new wireless station built by the Government near Kallundborg in the north-west of Zeeland, was opened on Aug. 29 by M. Stensballe, the Minister for Public Works, and M. Chambellan Lerche, the President of the Wireless Council. The station works on an output of 7 kw., and broadcasts daily on a 1,153 metres wavelength.

EGYPT.—From a recent report of Mr. E. Homan Mulock to the Department of Overseas Trade, London, the following interesting paragraphs should prove both authoritative and interesting :—

" In September, 1926, an agreement was concluded between the Egyptian Government and the Eastern Telegraph Co., whereby, *inter alia*, the royalties per word payable to the Government were doubled, while the company was given permission to lay five additional cables between Port Said and Alexandria. This has made it possible for the company to operate its regenerator system right through from London to Bombay and to accelerate telegraphic communication between England and Malta, Egypt and India.

At the end of 1926 a commencement was made with the changing over of the Cairo telephone system to automatic working. In the meantime the provision of additional trunk facilities between Cairo and Alexandria has been still further delayed.

An agreement was also made, in May, 1926, between the Government and Marconi's Wireless Telegraph Co., Ltd., whereby the latter was authorised to exploit for purposes of commercial radio-telegraphy the station at Abu Zabal, near Cairo, which is at present operated by the British Post Office. An Egyptian company was to be formed within six months, but there have been delays in connexion with the securing of a suitable site for a receiving station."

FRANCE.—The Société de l'Energie Electrique de la Basse Isère and the Société de Transport d'Energie du Centre, which jointly operate two 120,000-v. transmission lines, one between Beaumont-Monteux, St. Etienne and St. Chamond, and one between St. Etienne and Monistrol-d'Allier, have recently installed in connexion with these lines the Marius-Latour system of high-frequency wireless telephony. The installation is described by M. R. Dubois in a recent issue of the *Revue Générale d'Electricité*, where he states that the communication instruments are located in wooden cabins, in which all the high-frequency circuits and the amplifying and modulating valves are grouped. The installation has so far worked with equal regularity to an ordinary telephone system, messages being transmitted with great purity and sufficient intensity. The automatic devices have given no trouble, while valve renewals, the only item that enters into the cost of maintenance, are very low, having regard to their degree of operation. Thus, over a period of six months, the valves in each cabin have had to be renewed but six times, at a cost of 600 fr., and this for an average daily use of six hours. M. Dubois remarks that the total cost of the installation was lower than that of an ordinary telephone line, and that it possesses many advantages, notably as regards immunity from storm damage, &c., the ease with which repairs can be effected, and low cost of maintenance.

M. Dubois, it will be recalled, described this particular carrier-wave system before the International Electrical High Power Conference held in Paris a couple of months ago.

GERMANY.—The radio-telephone tests between Germany and South America have been continued to an extent from which it would appear that the inauguration of a regular service between the two ports of Hamburg and Buenos Aires is likely soon to be an accomplished fact.

" German wireless manufacturers," says a special correspondent of *The Times Engineering Supplement*, " rely to a considerable extent upon the annual wireless exhibition held in Berlin each autumn for stimulating their exports during the winter season. As the greater portion of the foreign trade in wireless is done with European countries either immediately adjacent or within easy distance, the Grosse Deutsche Funkausstellung (held this year from Sept. 2 to 11) is visited each year by a large number of wholesale buyers from practically all European countries. To Great Britain, German exports during 1926 were about 33⅓% down, which resulted in increased efforts on the part of the exhibition authorities and the trade to secure the attendance of British buyers.

So far, the wireless exhibition hall at Kaiserdamm, Berlin, is the only large hall in the world built especially for wireless exhibitions. It has been constructed without the usual iron or steel framework or roof, which would have a prejudicial effect upon wireless reception. The Berlin gathering contains receiving sets, loud speakers, and telephones, the majority of which are ready for instant demonstration. By the side of the hall is erected the wireless tower, which is about half the size of the Eiffel Tower, and serves to support the sending aerial of the Berlin broadcasting station, as well as being provided with a powerful searchlight at the summit for the purpose of guiding night-flying aeroplanes. The tower is served by an express electric lift, and a large restaurant is installed at 160 ft."

A particularly interesting item was that regarding multiple valves. Says the correspondent :—

" Numbers of multiple valves are exhibited containing within the one bulb the essential parts of three or even four wireless valves, as well as coupling resistances and other parts, thus immensely reducing the cost of receiving sets. For instance, one set embodying a single ' multiple valve ' (a ' Dreifachröhre ') was claimed to give loud-speaker reception from a local broadcasting station equal in strength to a normal three-valve set, and was priced at 39.50 m. retail complete with the valve."

The Karolus-Siemens apparatus for the transmission and reception of photographs, documents, &c., described in the *T. and T. Journal* of March last, was also shown in actual operation by the Reichspostamt Wireless officials. The latter, says *The Times* man, have a strong feeling that this system will in the near future render obsolete all existing methods of communication by Morse code, more especially with distant countries, as the transmission of a document or picture measuring 4 in. by 4 in. takes no more than 20 seconds, and the speed of working is being steadily increased.

GREAT BRITAIN.—The British Broadcasting Corporation states that the present position regarding Empire Broadcasting is that, while considerable progress is recorded particularly on the transmitting side, difficulties of reception are still to be overcome. Results up to now have been purely sporadic and fortuitous. The recent experimental relay of Sydney was recognisable ; the parallel attempt to relay Melbourne yielded complete silence. At the present rate of progress a new series of experiments will be attempted this month (October), and upon the results of these will depend the date of the inauguration of an Empire service.

The first full experiment in Empire broadcasting from Great Britain took place on Sept. 11 from the experimental station, 2NM Caterham, owned by Mr. Gerald Marcuse, when a programme designed for reception in Australia was given. Arrangements were made in Australia through the Melbourne *Herald* and the Sydney *Sun* for the relaying of the programme by the principal broadcasting stations in the Dominion. Sir Granville Ryrie, the High Commissioner for Australia, gave a short address, and all the artists who took part in the programme were Australians resident in this country. The Wellington correspondent of *The Times* reports that the broadcast was received, but the speeches were not clearly intelligible, and the music was faint. It is understood that the generator failed and that it was necessary to resort to the electric light mains during the programme.

It is reported that Mr. H. Anthony Hankey, representing the Wireless Association of Great Britain, is shortly to visit the Dominions and Colonies in connexion with Empire broadcasting. According to *The Times* it is the hope that the visit will culminate with the formation of an Empire Broadcasting Association to deal with every aspect of the matter.

The *Electrical Review* is informed that within a few weeks there will be a further development in the opening, by Marconi's Wireless Telegraph Co., Ltd., of commercial " beam " telegraph services between England and South America, and between England and the United States of America. The " beam " stations for direct communication between Canada and Australia are also nearing completion, and this latter service is expected to be opened in the near future.

The B.B.C. has announced that changes are to be made in the hours of the morning transmissions from 2LO and 5XX. From Sept. 26 onwards the Daventry station will transmit from 11 a.m. to 2 p.m., and the London station from noon to 2 p.m. daily, from Monday to Friday inclusive. The present temporary arrangement for Saturday broadcasting will be revised on the 1st of the present month, both London and Daventry transmitting from 1 p.m. to 2 p.m.

The new 30-kw. experimental station (5GB), after tests on Aug. 19 and 20, commenced to transmit at a frequency of 610 kc. (wavelength 491.8 metres) on Aug. 21. Transmission continues good, cone-speaker reproduction 8 miles west of 2LO being equal in quality to that of the London station and decidedly stronger than that of the long-wave Daventry plant. The new station is situated a few hundred yards from Daventry (5XX), and at first will use two " T " aerials supported on two pairs of 110-ft. masts ; energy will be supplied to the aerials by transmission lines a few hundred yards long. Two

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325-ft. masts are being erected for further experimental work. The transmitter has been designed and erected entirely by the B.B. Corporation's engineers, and at present it is in rough form, having been built up as experiments proceeded; it is not equipped with spare machinery in the same way as are other stations, and for this reason it may not have the same degree of reliability. The transmitting circuit differs from that used in the older stations of the B.B.C., since modulation takes place at comparatively low power and the modulated carrier is magnified by a power amplifier using water-cooled valves. A constant wavelength is maintained by a master oscillator, isolated from every influence which might tend to vary its frequency. The low-power and modulator valves are of the ordinary glass type; the anodes of the power valves are energised partly by a high-voltage direct-current motor-generator giving 10,000 volts, and partly by a bank of six water-cooled rectifying valves working directly from the supply mains and giving, with the aid of a smoothing circuit, the same d.c. voltage. This unusual arrangement has been adopted purely for experimental purposes. The supply mains are the same as those used for 5XX, and an additional sub-station has been built for supplying 5GB. It is not working in full power at the time of writing.

The *Wireless Trader* reports that during July the value of radio apparatus exported from this country was £71,558 (including valves, £12,132), which was considerably below this year's monthly average. Australia was our principal customer, taking goods to the value of £22,031 (valves, £5,400), and the Netherlands was second with a share valued at £3,236.

CONTINENTAL RELAYS.—Experiments, says the *Electrical Review*, are in progress to determine the possibility of relaying radio programmes to this country by land line from the Continent. It is considered that the best route for such programmes is via Ostend, whence a new submarine telephone cable has lately been laid to England. Accordingly a "repeater" station has been installed at Ostend, so that programmes may be amplified before crossing the Channel. On this side the programmes will be conveyed to Savoy Hill by real "wired wireless," whereby a number of signals can be sent simultaneously along one wire, each group of signals being modulations of a carrier wave of a certain wavelength. The advantage, apart from economy in the number of cables necessary, is the elimination of much land-line distortion. Recent tests were conducted with music played in Ostend, which thus did not have to travel any considerable distance on Continental cables which, it is feared, would introduce new factors of distortion.

The reference to "*real* wired wireless" is not particularly clear, and as for the reversion to the use of cable lines, would not this appear to denote something in the nature of a defeat for Radio engineers?

GREECE.—The Posts, Telegraphs and Telephones Department is, says the *Financial News*, considering the installation of wireless stations for communication with the Islands and Crete. It is proposed that there should be stations at Athens, Chios (Scio) and at Candia (Crete). Further stations would be established at Laurium and in Crete for communication with vessels in the Archipelago and in the Mediterranean Sea.

HUNGARY.—The Hungarian postal authorities are reported to have recently placed an order with the German Telefunken Gesellschaft, of Berlin, for the equipment of a powerful wireless transmitting station which is to be established about 7½ miles from Budapest, where two 492-ft. antenna masts about 980 feet apart are at present in course of erection. It is expected that the new station will be ready for operation early in 1928.

IRELAND.—*The Times* states that the Irish Lights Office has recently informed the Imperial Merchant Service Guild that the Commissioners of Irish Lights have under consideration the erection of a wireless direction-finding beacon on the north coast of Ireland. Opinions are divided as to whether it should be on Tory Island or Inishtrahull. The beacon will probably have a useful mean range of about 100 miles for vessels fitted with a high-class, well-placed wireless direction-finding compass, down to about 50 miles where conditions on board are less favourable. The Commissioners ask the opinions of navigating officers of vessels which habitually pass the north coast of Ireland as to whether Tory Island or Inishtrahull is likely to be the more useful site for such a beacon, and steps are being taken by the Guild to obtain the views of their members on the subject. The Commissioners have also informed the Guild that the Irish Free State Post Office has notified the Commissioners that it intends to erect a wireless direction-finding station at Malin Head, which, it is expected, will be in operation in about six months' time.

ITALY.—On Monday, Sept. 12, the International Congress of Electrical Science was opened at Como, under Government auspices, in the presence of descendants of Volta's family. An address was delivered by Senator Garbasso, relating to the consequences which had resulted from Volta's invention of the primary cell and his discovery of current electricity. A paper was read by Sir Ernest Rutherford, president of the Royal Society, in which reference was made to Volta's communication to the Society in 1793 and to the medal awarded to him for his discovery. Other papers were read in honour of Volta, and his statue in Como was visited.

The International Convention on long-distance telephony inaugurated its proceedings at Como on Sept. 6. Representatives of all the principal European states and of several railway companies were present. Engineer Milon, Director-General of the telephone service of France, was elected president, and Professor Giovanni Di Pirro, Director of the Italian Institute of Experimental Work, was made vice-president. The meetings were to be held continuously during the week.

As we go to press the new radio transmitter at the Milan station, which is to take the place of the present one, is still continuing its nightly tests from 11 to 11.45 p.m. The frequency is 950 kilocycles (wavelength 315.8 metres).

Among the concerns recently organised in Italy in connexion with the electrical industry is the Società Fabbrica Nazionali Apparechi Telefonica (the National Telephone Apparatus Manufacturing Company), Milan, with a capital of 200,000 lire.

INDIA.—As all the world knows, the Anglo-Indian Beam Wireless Service was opened for public traffic on Sept. 6. The new service places London in direct wireless communication with Bombay, and is available for telegrams to all destinations in India, Burma, Ceylon, Iraq, Persian Gulf, Siam, &c. The reduced rates per word to India by this route are 1*s.* 1*d.* for ordinary telegrams, 6½*d.* for deferred telegrams, 3½*d.* (with a minimum of 20 words) for daily letter telegrams, and 3*d.* (with a minimum of 20 words) for week-end letter telegrams. In addition to the reduction in the rates for public traffic the beam service offers a reduced rate of 2½*d.* a word for Press messages. All telegrams intended for this route should be routed "Via Empiradio."

So far, the service has proved wonderfully effective, especially when one considers the mingled hopes and fears which were naturally associated with the inauguration of this the completion of the Empire chain of communications, an effective chain without equal in the world's history.

Under the Government contract with the Marconi Company, the "beam" stations for communication with India were to be capable of sending and receiving at the same time at a minimum speed of 100 words per minute during a daily average of twelve hours. During the seven days' official test the Marconi Company estimated that an average speed of between 130 and 150 words per minute was maintained during from 18 to 21 hours per day, and that the capacity of the Indian "beam" circuit during the test was about 180,000 words per day in each direction. It is well known that during the monsoon period India is one of the worst countries in the world for atmospheric interference; hence the fact that the Indian "beam" stations have been able to work at high speed for hours on end during that period is a remarkable testimony to the freedom from atmospherics that is obtained by the use of "beam" receiving aerials.

The transmitting installation at Grimsby for the England-India service is in the same room as the transmitter for the England-Australia service. Transmission to India takes place on wavelengths of 16.216 and 34.168 metres, and from India to England on 16,286 and 34,483 metres. At Grimsby a five-mast aerial system, quite distinct from the three-mast aerial system of the Australian service, has been built. The masts are 277 feet in height, with a distance of 650 feet between them. Two bays are used for one wave-length, and the other two bays for the second wave-length. The masts are erected in a straight line at right angles to the great circle from the transmitting station at Grimsby to the receiving station in India, and the reflector behind the active aerials focusses the main energy in a south-easterly direction on to the receiving aerials in India. A similar aerial system has been built at Kirkee to carry out the transmissions to this country.

In the case of the Kirkee station this latter is "controlled" from Bombay by means of "*wired wireless*," while Grimsby is "controlled" from London over an ordinary telegraph circuit.

The receiving apparatus for the signals from India is installed at Skegness in the room where the receiver for the Australia-England service is also placed, while the receiving station at Dhond in India is identical in design with that at Skegness.

Mr. Keith Murray, of the Calcutta Broadcasting Station, proposes to carry out extensive tests for the purpose of gathering data, in order to gauge the possibilities of intercommunication in coal mines by means of wireless. The present method of communication is by means of the telephone, which has serious drawbacks. It was hoped that the experiments would commence about the end of September; the information obtained therefrom will be sifted and alterations will be effected in transmitters and receivers before a further attempt is made. The wavelength used will be 30 metres, and another wave will be between 1 and 6 metres; the latter seems to have been specially licensed by the Government.

NORWAY.—It is reported that a broadcasting station will shortly be in operation on the Tyholt heights, near Trondhjem. A wireless-telegraph station for communication with Great Britain is also to be erected on the heights.

PERU.—It is reported that Marconi's Wireless Telegraph Co., Ltd., has inaugurated a wireless station at Oaz.

PORTUGAL.—The directors of the Anglo-Portuguese Telephone Co., Ltd., state that the Connaught Trust, Ltd., has acquired about a third of the company's 7% first mortgage convertible debenture stock (which carries an option to subscribe to a further £100,000 of stock) and more than half of the issued ordinary capital. "The directors and the new majority shareholders believe that the company's business in Portugal admits of profitable development on a considerable scale" and it is consequently proposed to reorganise the capital. The suggestion is to increase the capital to £1,100,000 by the creation of 200,000 new ordinary and 100,000 "A" ordinary shares of £1 each, the latter class to be exchanged for debenture stock. The ordinary shares will rank for dividend before the "A" shares, being entitled to the first 8% declared. The "A" shares will then receive the next 8%. Any future advantages will be shared between the two classes.

RUSSIA.—According to a note published by the *British Russian Gazette and Trade Outlook*, there are now 56 broadcasting stations in Russia, of which nine are in Moscow and five in Leningrad.

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SOUTH AFRICA.—The Postmaster-General announces that a week-end letter telegram service to the Union of South Africa has been introduced by the Anglo-South African beam wireless service at the reduced rate of 3½*d.* a word, with a minimum of 5*s.* 10*d.* for a message not exceeding 20 words. Telegrams for the new service can be handed in at any postal telegraph office.

SPAIN.—Reuter's Madrid agency informs us that the inauguration has taken place of the cable factory at Maliano (Santander) constructed by the Standard Electric Company to supply the needs of the Spanish telephone service and to export to South America. The necessary copper will be obtained from the Cordova works, the lead will also be supplied from national resources.

TURKEY.—In a recent report by Col. H. Woods, O.B.E., Commercial Counsellor at Constantinople, it is stated that the construction of radio transmitting and receiving stations at Angora and Constantinople is now practically completed. The contract for the undertaking was secured by the Compagnie Française de Télégraphie sans Fil.

U.S.A.—*World Radio* affirms that twenty radio stations in the New York metropolitan area have been notified by the radio supervisor of the Department of Commerce that because of repeated deviations from the wavelengths assigned to them their licences will not be renewed unless they can "show cause." About twenty-five stations are expected to discontinue broadcasting when new licences for sixty days are issued by the Federal Radio Commission. Over one hundred stations, the Commission says, declare they cannot continue broadcasting unless better wavelengths are given to them, but the Commission does not expect them to discontinue operation. Some stations, however, in the opinion of a member of the Commission, are continuing to operate merely because of the belief of their owners that they have something which sooner or later they will be able to dispose of advantageously.

The *Wireless World* states that long and expensive litigation has been ended in the United States by an agreement which has been reached between the Radio Corporation of America and the Atwater Kent Manufacturing Co. Under the agreement 7½% of the sale price of all radio receiving sets manufactured by the latter company since January, 1923, and to be manufactured in the future will be paid to the Radio Corporation. The Corporation's claim was on account of basic patents in its possession.

According to *Commerce Reports*, the total value of exports of radio apparatus from the United States during the first six months of this year was $3,705,961, as compared with $3,247,802 in the first half of 1926. There was a considerable decline in the value of transmitting sets, but substantial rises in receiving sets, components, accessories, and valves. The exports during 1926 (totalling $8,794,453) are fully analysed, and it is seen that the largest share of United States exports was taken by North America (Canada)—38% of the total. Australia and New Zealand took 22.2% of the total. The shares of Europe and South America each represented 14.4%. The Netherlands and the United Kingdom together took 68% of the exports to Europe. In South America the sales of United States accessories have declined, probably because European competition is very keen in these items.

The opening of the Beam service to India, mentioned elsewhere, was tragically marred so far as the Central Telegraph Office, London, was concerned by the sudden death of Major Vincent Smith, press representative of the *Times* newspaper, who collapsed during one of the speeches and who expired before he reached St. Bartholomew's Hospital, practically only a few yards away.

Nature gives an account of a new type of electric cord which it is stated is coming into use in Berlin in connexion with bells, &c., and for starting and stopping machinery. It is the invention of Mr. Oscar Nagy, a Hungarian engineer. The wires are woven into a loose braid separated by an elastic non-conductor, but contact is made when pressure is applied. It is anticipated that this device will prove useful in the case of machinery where actual or threatened accidents necessitate an immediate stoppage, as—so it is stated—pressure can be easily operated by the knee or elbow. Other uses are suggested, but the idea seems somewhat fantastic, and judging from some of the most recent developments of wireless, an alternative would be the application of the "audible control" system employed by Major Raymond Phillips at the recent Model Engineer Exhibition held last month at the Royal Horticultural Hall, London, where the major by shouting into a microphone the word "stop," immediately brought a couple of model trains to a standstill, reversing their direction by the word "back," and so on.

The major believes that ultimately :—

"Train alarm bells will give place to microphones which, upon registering an exclamation of alarm, will stop the train.

"Doors will actually open to the command of 'Open Sesame.'

"Machinery will stop instantaneously in the case of an accident upon a cry from an endangered person."

A Southampton firm have also developed a burglar alarm system which—provided the burglar has not previously disconnected the circuit!—brings into operation a small wireless transmitter of 600 to 800 metres. This in turn automatically operates a 5 or 6-valve receiving set at any point within a radius of 50 miles. The buzz from a small instrument at the transmitting end is reproduced by the various receiving points with an enormous volume through a loudspeaker.

The *Electrical Review* states that this system was recently adopted in a French village, where the volunteer fire brigade is called out by wireless. When a fire occurs the central fire station sends out a special and selective signal which instantly brings into operation all the sets installed in the houses of the volunteers within a radius of 20 miles. Local relays installed in the firemen's premises are kept continually in circuit by a 3-w. lamp, and are so adjusted that on a certain wavelength and at a particular note they release a local switch which brings the tuned wireless set into operation. The central fire station announces the location of the fire and then switches off. The relays are then replaced by hand.

The following paragraph is excerpted from the Financial section of a recent issue of the *Electrical Review*.

"The market in Eastern cable stocks and shares is heavy. Eastern Telegraph ordinary has lost 5, dropping to 173½. Globes, Westerns and Eastern Extensions are decidedly dull. The explanation is that the market is suffering from one of its periodical attacks of nerves caused by wireless developments. Dealers say that the Eastern quartette has been attacked by 'Beamitis,' the opening of the wireless service to India, and the benediction that this received from the Postmaster-General, having led to doubts as to the security of the cable system's profits. Similar heartsearchings have been experienced in this department of the miscellaneous market, at various times, for the past 15 years, and it seems hardly necessary to recite, once again, the reasons for assuming that the cable companies are well able to hold their own in this branch of industry."

The special committee of the Association of British Chambers of Commerce appointed to enquire into the basis of the present International Telegraphy Convention has submitted a number of recommendations, of which the principal are the following :—

"That the length of the standard code word be reduced from ten letters to five letters, at 50% of the present charge for ten-letter words, but that it would be detrimental to trade if on the adoption of the five-letter unit more than 50% of the present ten-letter rate were charged.

"That that portion of the regulation of the Paris Conference, 1925, by which, as from Nov. 1, 1926, numbers in deferred cablegrams when written in words may not exceed one-third of the number of chargeable text words should be rescinded.

"That code words should be admitted in deferred telegrams.

"That the pronounceability test, provided for in Article 9, section 2, of the regulations made under the Convention, which is already practically a dead letter, be formally abolished.

"That the limit of 15 letters to one word for place and street names in the address of a telegram should be abolished."

Dr. S. C. Bradford, of the Science Library, South Kensington, London, in describing the resources of this marvellous collection of scientific information, states that by the autumn of the present year the preparation of the subject-matter index will have advanced sufficiently for it to be made available to the public. The library will contain over one million references, and of these 61,000 are directly connected with electrical engineering and no less than 2,700 specifically related to telegraphy and telephony. This is, indeed, as the title of Dr. Bradford's article describes it, "A National Bureau of Information."

The reference to other sections of engineering, including steam, locomotives, machine tools and workshop practice, number over 83,000.

The Central Telegraph Office, London, was pleased to greet Herr Feuerhahn, of the German Telegraph Administration, during his visit last month to G.P.O. West, and to wish him every success on his trip to the United States of America.

Among the "Books in the Press" of Messrs. Macmillan is noticed an illustrated "Text-Book on Telegraphy," by A. E. Stone and A Fraser, and would-be telegraphist students should need very little further introduction.

The retirement of Mr. Mansbridge from the Vice-Controllership of the Stores Department removes another outstanding figure among the telegraphists of the early eighties which Slingo's School of Science brought to the front. The service cannot but be poorer for his withdrawal from its activities. That Mr. Mansbridge is likely to enter into an inactive retirement is not likely. Among other hobbies he is a great lover of flowers, the affection for which is reflected in the kindliness of his nature, hidden, maybe, under his towering exterior, but there nevertheless. Welcome, then, G. M., to the swelling ranks of the "eighties" who, like yourself, have passed the 60th milestone!

It is gratifying to learn how great has been the appreciation of the article by Mr. Phillips on the Verdan modification of the Baudot apparatus which appeared in our last issue. That the arrangement may not be *the* solution of "atmospheric" difficulties is more than probable, as telephotography offers certain undeniable advantages. On the other hand, there can be no doubt that the devices of M. Verdan are very effective, and, what is more, they are at this actual moment in daily use between France and Algiers.

Women and Unequal Laws.—It has been the great error of men—and one that has worked bitterly on their destinies—to imagine that the nature of women is, I will not say inferior, that may be so, but so different from their own, in making laws unfavourable to the intellectual advancement of women. Have they not, in so doing, made laws against their children, whom women are to rear? against the husbands of whom women are to be the friends, nay sometimes the advisers?

Ione, in "The Last Days of Pompeii," by Lord Lytton.

J. J. T.

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THE MODERN CENTRAL TELEGRAPH OFFICE AT ZARAGOZA, SPAIN.

BY ESTAN. RODRIGUEZ (TELEGRAPH ENGINEER).

[The history of this little article is an interesting one. The original was written by Señor Rodriguez in Spanish, and was then done into Esperanto and published in *La Interligilo de l'P.T.T.*, Paris. The editor of the latter journal subsequently translated the article into French, and in that language it reached this country, being again translated as below. The illustration blocks were loaned by M. Ullrich, of Bürgstein, Czecho-Slovakia, who kindly forwarded them free of charge for the use of the *T. and T. Journal*.—J. J. T.]

THE installation of the telegraph services in the Palace of Communications, Madrid, will bear comparison with any other central telegraph office in the world. That new centre was completed at the beginning of 1922, and marked the point where the Spanish exploitation of the telegraphs entered into a new path, sustained by the courage and capacity of its telegraphists. The telegraph *technique* of our country seeks to create forms and processes purely Spanish, rejecting completely all the old methods. Thus is being created, little by little, a national *technique*, adapted at all points to the service of our country.

Already in the international contests, the Spanish telegraphists have shown their progress and their capacity. By the good work which they have done at the Scientific Congress of Salamanca, the new Central offices of Bilbao, Valladolid and Burgos prove their high worth.

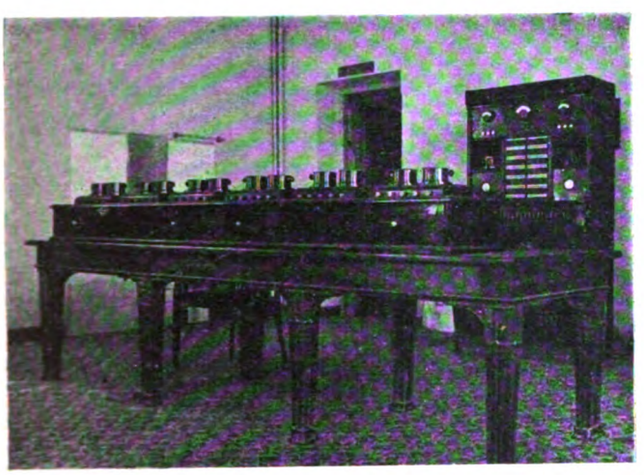

FIG. I.—TEST TABLET AND REPEATERS.

The last proof, if another were needed, is the new C.T.O. of Zaragoza, designed to be one of the principal centres of the Spanish telegraph network on account of its geographical situation and the importance of the town.

The postal and telegraph services of Zaragoza are now housed in a new and vast building. The style of the exterior is that of Aragon renaissance, and could well outrival the finest palaces of that period. The interior, however, gives more modern evidences, due to the use of ferro-concrete for the frame-work. Nothing has been neglected, the various services are comfortably placed—[Notice the arm-chairs for Baudot operators, for example! Fig. III.—ED. *T. and T. Journal*.]—and in the best hygienic conditions.

Let us, however, briefly study the lay-out of the telegraph services.

The instrument room is over 100 feet long by nearly 30 feet wide and is excellently lighted by windows on both sides of its length. The apparatus is placed at right angles to the length of the room and the necessary wires are led to the various tables by means of troughing covered by metal plates fixed into position by means of screws.

At one extremity of the room (Fig. I) is placed the commutator, or test tablet, fitted with the usual telephone jacks and cords. All the necessary facilities for the ordinary testing of the lines, &c., are available at this point, and here are also to be found all the usual protective devices against damage to apparatus, &c. The whole was designed and constructed in the Government works at Madrid, and is therefore a purely Spanish production due to the eminent and modest director, M. Ramón Miguel Nieto, who is, indeed, responsible for the entire technique of the Spanish Telegraphs.

By the side of the test-tablet is placed the power box from which, *au moyen de résistances appropriées*, each apparatus is provided with the necessary voltage.

In front of the test tablet are to be found six Lorenz relays and certain auxiliary testing apparatus.

The second section, Fig. II, accommodates ten Hughes circuits connected to neighbouring centres and provincial towns, also ten Morse circuits which serve eighteen lines to points of minor importance.

The remainder of the room is occupied by a simplex quadruple Baudot fitted with re-transmitters. There are also other Baudot re-transmitters for "through" working, Fig. III.

All apparatus is fitted on tables covered with black fibre, the table-legs being suitably grooved to permit of the wiring being hidden from sight. This wiring is carried out by means of lead-covered cables containing wires of varying gauges suitable to their various sizes.

FIG. II.—HUGHES AND MORSE SECTION.

The telegraph lines leave the office by a small underground cement channel entirely covered with asphalt, and are contained in three lead-covered cables of twenty paper-insulated conductors each. This channel terminates in a column 40 feet high, which constitutes the junction box between the covered and aerial systems and contains the necessary fuses, &c.

At the test-tablet end of the Instrument Room, and in close proximity thereto, is the Test Room where the usual facilities are provided for more closely examining and testing faulty or suspected lines, &c. Adjoining the latter is an admirably equipped workshop for the repair and maintenance of apparatus.

At the other end of the Instrument room, in a specially chosen position, is to be found the generating machinery and accumulators for the power supply of the office.

The batteries for the long-distance lines consists of two groups each of 99 cells of 49 amp.-hours at 110 volts. The current for the shorter circuits

FIG. III.—BAUDOT AND BAUDOT RE-TRANSMITTERS SECTION.

is similarly supplied by two groups each of 19 cells of 90 amp.-hours at 30 volts. The whole of these cells are of the Tudor type, and can be charged either from the town supply or by two local dynamos driven by a 3½ h.p. petrol engine giving 190 and 90 volts respectively.

The equipment of the office is completed by the installation of a small PBX, while all clocks on the building are electrically driven and controlled.

This glance, though a rapid one, over the Zaragoza C.T.O., would tend to show that the Spanish telegraphs are reaching a high level.

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PRESENTATION TO MR. JOHN LEE.

A FURTHER striking tribute to Mr. John Lee, late Controller, Central Telegraph Office, has been paid on the occasion of his retirement.

A number of friends and colleagues in the provinces combined to present Mr. Lee with a suitable memento of the occasion, and a large number of postal, telegraph, and telephone men and women contributed towards the cost of a handsome upright grand gramophone and a number of gramophone records.

The gramophone bears the following inscription :-

"Presented to JOHN LEE, Esq., C.B.E., M.A., M.Com., "Controller, Central Telegraph Office, London, by Postal, Telegraph, "and Telephone Colleagues in Great Britain and Northern Ireland "on the occasion of his retirement from active service.
"June 1927."

The following letter of acknowledgment has been received from Mr. Lee :-

[COPY.]

Mulgrave Lodge,
Sutton, Surrey.
Sept. 10, 1927.

My dear Clough,—To-day there was delivered at this house a beautiful 1928 model gramophone of the H.M.V. type ; it is cased in exquisitely prepared walnut. Together with it there were records such as will give us real pleasure again and again for years to come. I want to thank you and those whom you represent for an act of thought and kindliness which is much more to me than I am able to say. It comes just as I was feeling that the restrictions which have been placed upon my reading and writing bore very heavily upon me. You have given me a source of great joy which will more than take the place of joys which I have had to surrender. Archibald also sends to me a brass plate and we are arranging with a local cabinet maker to affix it in a suitable way. It will be an additional source of pride.

It brings back to me the many years of the past. There is Liverpool, of course, and all that it has been and all that it is and will be to me. And there are the other places which I visited as an official visitant and where also I found the preciousness of deep friendships. It is hard to leave such a service, but it is one of the compensations for the break to have the experience of your tenderness of judgment and your faithfulness of friendship.

It happens, too, that this comes on a day when I am allowed to think that I have made a step forward in health. I was sent to Bath for a "cure," as they call it. The process was severe and perhaps depressing, but I think I can now say that I am seeing the benefit. I shall never be restored but within certain limitations it is possible that I shall be able to do some little work in the world.

I beg you, my dear Clough, to accept yourself, and to convey to the others, my deepest sense of regard, appreciation and indebtedness, and my great pride in the gift which they have chosen to make to me.

I am, my dear Clough,
Ever yours most sincerely,
(Sgd.) JOHN LEE.

CORRESPONDENCE.

BAUDOT-VERDAN.

TO THE EDITOR OF "THE TELEGRAPH AND TELEPHONE JOURNAL."

Sir,—I find some need of a little further explanation of the Baudot-Verdan apparatus described by Mr. Phillips in the September issue of the *Telegraph and Telephone Journal*. His article, as do some of the French descriptions which have appeared, leaves me a little puzzled as to the exact method of operation, and perhaps the shortest way of arriving at a correct understanding would be to set down what I have assumed actually happens. First, it is clear that the repeaters store up to six letters, and this explains why they run at one-sixth the distributor speed. The operator sends out letter signals continuously in accordance with the usual cadence signal, one letter per revolution. Assuming for simplicity that the operator at the right moment sends out one letter signal only and the transmitting and receiving system is then left to itself, the operation, as I understand it, is as follows:—

Sending End.

First revolution	...	Signal sent to line and stored in first repeater.
Seventh "	...	Signal repeated to line from first repeater and stored in second repeater.
Thirteenth "	...	Signal again repeated to line by means of the second repeater and also recorded on the control traducteur.

Receiving End.

First revolution	...	Letter signal received and stored in first repeater.
Seventh "	...	Letter signal again received, cancelling the effect of any extras set up on contacts of first repeater and setting up second repeater.
Thirteenth "	...	Signal again received, correcting for any mis-setting of second repeater and operating traducteur magnets.

Revolution 2-6, 8-12, 14-18 would of course be used for five other letters.

I should be greatly obliged if Mr. Phillips would either confirm the above or set me right.

If my assumptions are correct, one can only admire the ingenious improvements Mr. Verdan has made to his system by which the same signal is repeated at intervals sufficiently remote to minimize the possibility of the same signal element of a letter being mutilated by atmospherics.—Yours faithfully,
H. H. HARRISON.

Automatic Telephone Mfg. Co., Ltd.
Liverpool, Sept. 19, 1927.

[Mr. Phillips says "Mr. Harrison's description of the functioning of the 'Baudot-Verdan' is quite correct. Six signals are stored during each revolution of the discs and automatically repeated seriatim every two seconds." He sends an explanatory chart which we shall publish next month.]

THE POST OFFICE TELEPHONE AND TELEGRAPH SOCIETY OF LONDON.

SESSION 1927-28.

AN interesting and varied programme has been arranged by this Society for the forthcoming Session. The opening meeting will be held on Monday, Oct. 17, at 5.30 p.m., at the Institute of Electrical Engineers, Victoria Embankment, W.C.2, when T. A. Prout, Esq. (late Secretary's Office, G.P.O.) will give an address entitled "Fifty Years with Telephone Pioneers." L. Simon, Esq. (Assistant Secretary, Inland Telegraphs) the Chairman for the Session, will preside. Prior to the meeting, from 5 p.m. to 5.30 p.m., tea and light refreshments will be provided for members and visitors in a convenient room adjoining the Lecture Hall.

Particulars of the other meetings during the Session are as follow :—

Meeting Place.—INSTITUTION OF ELECTRICAL ENGINEERS.

1927.			
Monday, Nov. 21	...	"Telegraph and Telephone Finance."	Sir Henry N. Bunbury, K.C.B. (Comptroller and Acct.-Gen., G.P.O.).
" Dec. 12	...	"Press Telegram Work" ...	J. Newlands, Esq., C.B.E., C.I.E., I.S.O. (The Press Association, Ltd.)
1928.			
Monday, Jan. 16	...	"The Working of the International Telephone Services."	H. G. Trayfoot, Esq. (Telegraph and Telephone Traffic Section, Secretary's Office, G.P.O.).
" Feb. 20	...	"Voice Frequency Telegraphy."	W. D. Hamilton, Esq. (Engineer-in-Chief's Office, G.P.O.).
" Mar. 19	...	"Determination and Distribution of Time."	F. Addey, Esq., B.Sc., F.R.A.S., M.I.E.E. (Wireless Telegraphy Section, Secretary's Office, G.P.O.).
" April 16	...	"Telephone Contract and Development Studies."	H. J. Maclure, Esq., M.B.E. (Secretary's Office, G.P.O.).

By permission of the Governing Bodies, members of this Society may attend meetings of the Post Office Institution of Electrical Engineers, and of the London Telephonists' Society.

All members of the staff of the Post Office are eligible for membership on approval by the Committee. The annual subscription, payable in advance, is 1*s.* 6*d.* for women and 2*s.* 6*d.* for men. Application for membership should be made to the local agent, or to the Hon. Secretary, Mr. D. H. Thomson, Secretary's Office, G.P.O. North, E.C.1 (Central 3,600, Extension 298).

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THE TELEGRAPHS OF SOUTH AFRICA.

By E. Egleton, C.T.O., Cape Town.

The Postmaster-General of South Africa, speaking recently, urged that "the telegraphs be given a chance." The words must have a familiar ring to service readers in the old country who, no doubt, sometimes wonder what the telegraphs in other lands are like, and whether they are in the same state as their own. To those so minded a short account of the South African telegraphs may possess some interest.

The first telegraph line in the country, between Cape Town and Simonstown (21 miles), was opened in 1860, and in 1864 a line from Cape Town to Grahamstown, in the Eastern Province, 100 miles from Port Elizabeth, was completed. These early lines of the South African telegraphs belonged to the Cape of Good Hope Telegraph Company, and were transferred to the Cape Government in 1873. In Natal the Government took over the only existing line between Durban and Pietermaritzburg (60 miles) in 1874. Communication with Kimberley was established in 1876, Natal and the Cape Colony were linked by wire in 1879, while the first offices in the Transvaal were opened the same year. From these small beginnings the present widespread telegraphs of South Africa have grown, the network covering the whole Union, the neighbouring territories, and reaching as far north as the Belgian Congo and Uganda.

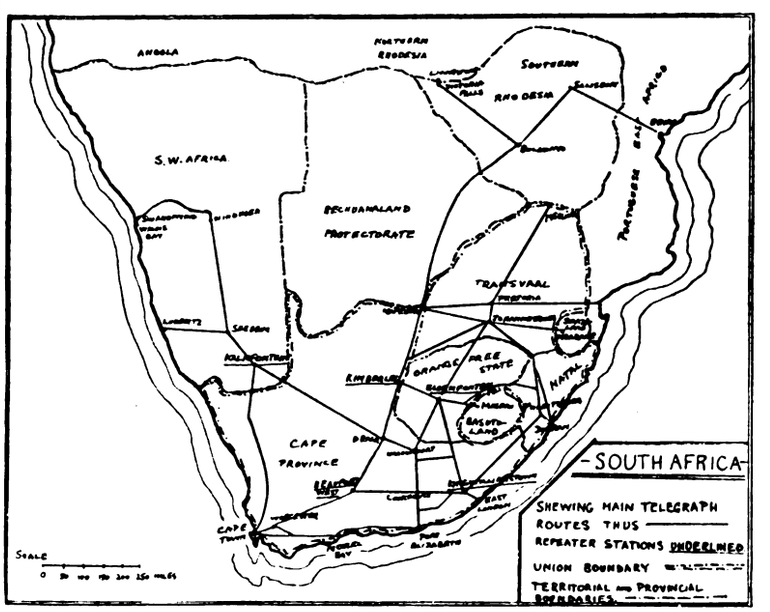
Prior to the unification of the Colonies in 1910 there were four telegraph services in what is now the Union of South Africa. They were similar in organisation and mainly followed British practice. Before the Anglo-Boer war practically all circuits were sounder worked, both single and double-current and duplex, all had a printer attached, and a tape record was kept. Many long station lines were worked single current, and on nearly all of them the intermediate stations called only half-hourly or hourly. Although some of the chief centres were in direct communication a good deal of handing over was done at intermediate points which were mainly transmitting stations. For example, Kimberley transmitted the whole traffic from the rest of the country to and from Rhodesia and beyond, and between the Cape Colony and Free State. And at Kingwilliamstown, purely a transmitting office, which had a staff of one hundred in the days of its greatest importance, the major portion of the Cape Eastern Districts traffic and that between Cape Colony and Natal was transmitted. The war years from 1899-1902 saw the introduction of Wheatstone working, and fast repeaters made direct Wheatstone working possible over long lines, e.g., Cape Town—Durban. The decline of the purely transmitting offices, such a feature of the early days, began at this time. There were few changes in the years following the Boer War, the principal being the abolition of the tape record, and the installation of secondary cells at a few of the larger offices.

The amalgamation of the services in 1910 rendered considerable reorganisation possible. The rigid separation of the old colonial areas ceased with the effacement of political boundaries. Traffic circulated into more natural channels as outlets were rearranged and new ones provided, and by 1914 the Union telegraph system could be regarded as completely unified. Something had been done to bring the organisation up-to-date, single-current working on long lines and calling stations were abolished, and in 1913 the Creed reperforating and printing apparatus, together with keyboard perforators, had been introduced at Cape Town and Johannesburg, but before full advantage could be taken of the many changes in the telegraph world the Great War broke out. In common with other countries the South African Administration had to face many difficulties during the war period. Staffs were depleted, although additional services had to be undertaken, while shortage of material also contributed its handicap. The staff shortage was met to a certain extent by a great extension of female labour, and from the later war years dates the employment of women in the larger instrument rooms on a considerable scale.

After the war there was lee way to make up, and the next few years witnessed the introduction of machine telegraphy, and other changes of various kinds. These changes have brought the system to its present state, of which some details may be given.

When considering the South African telegraphs, however, and making comparisons with other countries, the great area and small population should be borne in mind. The total area of the Union, and mandated territory of South West Africa, is 795,289 square miles, and in addition there are the contiguous territories of Rhodesia and Mozambique for whom most of the transmitting is done. The white population of the Union and adjacent territories is approximately 1¾ millions, and there are about 7½ million non-Europeans, but for telegraph purposes the total population can be reckoned as under two millions, in a country nine times as big as Great Britain, and with only 250,000 whites in its most populous district (Johannesburg).

Distances in South Africa are great, the large centres few and far between, and, although there are lines of greater length in other parts of the world, the main lines generally are very long. The main routes are given on the accompanying map. There are 9,335 miles of telegraph route and about 42,000 miles of wire. Cape Town and Johannesburg are the chief centres, with Durban and Port Elizabeth next in importance. The heaviest traffic is between Cape Town and Johannesburg, 960 miles apart, with two repeaters in circuit; and both the Western Electric Multiplex typeprinting and Creed eperforating systems are in operation. The former is worked quadruple duplex at a channel speed of 35 words per minute, and the latter duplex at about 90 words per minute each way. Between Cape Town and Durban approximately 1,250 miles distant via one route, and 1,100 miles via another, also with two repeaters in circuit, Creed apparatus is in use. The same apparatus is operated between Johannesburg and Durban (450 miles), and this "Creed triangle"—Cape Town-Johannesburg-Durban—may be regarded as a sort of backbone to the whole system. The Western Electric Multiplex is also worked from Cape Town to East London and Queenstown, forked at Kingwilliamstown to start-stop extensions, the line being about 700 miles long. A channel speed of 30 words per minute is obtained. This circuit is shortly to be rearranged and diverted to include Port Elizabeth. Cape Town will then work quadruple duplex, two channels to Port Elizabeth, and start-stop extensions to the other two offices. A similarly arranged circuit of about 650 miles, from Johannesburg to Bloemfontein (two channels), with extensions to East London and Queenstown is also Western Electric Multiplex. Western Electric Teletypes (duplex) are in use on several circuits, e.g., Johannesburg-Pietermaritzburg, Port Elizabeth-Queenstown, as well as on shorter lines, and are being introduced wherever traffic conditions allow, while between Johannesburg and Durban, the Western Electric "carrier" system is to be installed at an early date. By the "carrier" method one Creed and two duplex teletypes, as well as several telephone trunk circuits, will be obtained.



The longest line in the country is that between Cape Town and Bulawayo (1,360 miles), worked key duplex with one repeater in circuit. At certain times of the day this wire is repeated at Buluwayo to Salisbury, for "YQ" press, making it 1,650 miles long. The normal resistance of this line between Kimberley (repeater) and Buluwayo is 8,200ω., and the running speed only about 60 words per minute, but as the Rhodesian Administration is to introduce another repeater north of Mafeking the working of the circuit will be improved. Other long lines are between Cape Town and Pretoria, 1,000 miles (with two repeaters), Cape Town-Windhoek (South-West Africa), about 900 miles (one repeater), Johannesburg-Buluwayo, 700 miles (no repeater), Cape Town-Bloemfontein, 750 miles (one repeater), Port Elizabeth-Johannesburg, 700 miles (one repeater), and Durban-Port Elizabeth, 600 miles (one repeater). There is ordinary Wheatstone working on some of these circuits. Quadruplex working, ordinary as well as A side relayed and forked arrangements, are in use in a few instances. An example of this is Cape Town to Kimberley (650 miles) and De Aar (500 miles), forked at Beaufort West.

The repeater stations referred to are Beaufort West, 340 miles from Cape Town, relaying chiefly all Transvaal, Free State and Natal lines from Cape Town; Kimberley, in on the Cape Town-Transvaal and Bulawayo lines; Bloemfontein repeating Cape Town-Durban and Port Elizabeth-Johannesburg; Kingwilliamstown relaying Cape Town-Durban, Port Elizabeth-Durban, Port Elizabeth-East London and, with Beaufort West, traffic on the Eastern Telegraph Company's land wire from Cape Town to Durban, which is worked Creed between the Company's offices in these towns. This line is the only private wire rented from the Administration. The other repeater station is Kalkfontein, in South-West Africa, on the Cape Town-Windhoek circuit. Some of the "station" lines, with as many as six offices in circuit are over 200 miles in length. At Cape Town and Johannesburg concentrators, both single current (Central Battery) and double current, for suburban and local circuits, are installed, and switching facilities, although not in use at present, are provided at the latter office.

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The methods of operating circuits are similar to those in force in Britain. Typewriters are not used. There is no under-copy of the message, the original being delivered to the addressee, and a combined B and C form is in use. On machine and automatically worked circuits messages are numbered and sent in serial order, the serial numbers being checked and confirmed by Service message when the circuit is closed. On other duplex circuits "Rts" (Receipts) are acknowledged half-hourly, the total with the last "name to" being given. On "single" lines, working "up and down," and "station" lines the total with the last "name to" is given at the end of the batch. The "revised" or batch system of delivery, areas being divided into "walks" and messages taken out at regular intervals, is in force at the largest centres.

At many of the smallest offices telegrams are telephoned, and phonograms, although not very numerous as yet, are increasing and will require additional facilities. The standard attendance is 9 a.m. to 1 p.m., 2 p.m., 5 p.m., with half-hour extensions in some cases. At the larger places the offices are open from 8 a.m. to 6 p.m., and in the largest towns they are open from 8 a.m. to 8 p.m., so far as the public is concerned, with attendance up to 1 a.m. for Press traffic. Johannesburg is open all night during the week, closing at midnight on Saturday and on Sunday nights. At Cape Town there is continuous attendance. These two offices are the most important and have staffs of about 180 each, dealing with an average of 13,500 messages daily. Durban and Port Elizabeth handle about 6,500 and 5,500 messages per day with staffs of 75 and 65 respectively. The busiest day in the year is Christmas Eve, when the traffic reaches huge dimensions, nearly four times the normal, due to the popular custom of exchanging greetings by wire.

The press traffic, which amounts to about 31,000,000 words a year, has grown considerably of late, the inland press especially having greatly increased. This is partly due to the establishment of Afrikaans' daily newspapers receiving press in Afrikaans in addition to the news services in English already in operation. Most of the press traffic centres on Cape Town. All the overseas news, and much of the inland, including Parliamentary press, is handed in and transmitted from there. In conjunction with Reuter's Agency a classified distribution system is in operation from Cape Town only. The Parliamentary press traffic, fostered by the special Parliamentary rate, reaches large proportions. On Budget days and similar occasions it amounts to as much as 150,000 words, while 250,000 words have been transmitted from Cape Town on certain very special days. The principal offices are equipped with Creed apparatus for press reception and with Kleinschmidt and Creed typewriter keyboard perforators and perforators preparing three and four slips simultaneously are installed at Cape Town for the press traffic mentioned.

Overseas telegrams are transmitted at Cape Town and Durban, where they are handed over to the cable company who deal with cablegrams for these towns at their own offices, and to the Wireless Telegraph Company at Cape Town for transmission via "the Beam." There is also another route via the "Radio Directa" (Portuguese Wireless Company) at Lorenço Marques, Johannesburg being the Union handing-over office. A feature of the traffic is the large volume to and from Johannesburg, amounting to nearly a thousand messages a day. There are wireless stations at Cape Town, Port Elizabeth and Durban, in the Union, and at Walvis Bay in South-West Africa.

The rate for inland telegrams in South Africa (Union, South-West Africa and Lorenço Marques) is 1*s.* 3*d.* for the first 12 words or portion thereof, and a penny for each additional word, in effect a penny a word with a surcharge of 3*d.* per message. The surcharge is the increase compared with pre-war rates. Press telegrams are charged 1*s.* for 48 words (minimum) and four words a penny thereafter, but for Parliamentary press, which includes lobby gossip, notes from the House, &c., as well as reports of the debates, the charge is 100 words for 1*s.* (minimum) and eight words a penny afterwards. There is no difference between day and night press rates. Charges on all classes of telegrams are increased by 50% on Sundays, Christmas Day and Good Friday.

At the time of Union—1910—the number of telegrams handled by the South African Union telegraphs was 4,133,000 and the figures for the ensuing years are given in the following table:—

1911	...	5,119,000	1919-20	...	7,646,000
1912	...	5,629,000	1920-21	...	6,995,000
1913	...	5,864,000	1921-22	...	6,091,000
1914	...	5,999,000	1922-23	...	5,520,000
1915	...	6,166,000	1923-24	...	5,381,000
1916	...	5,693,000	1924-25	...	5,452,598
1917	...	6,175,000	1925-26	...	5,905,063
1918	...	6,620,000	1926-27	...	6,055,679

The war years 1914-1918 were followed by a boom period, 1919-1921, succeeded by a slump from 1921 to 1924, after which conditions approximating to normal were reached. The totals for the last two years are higher than the last pre-war year 1913, and an increase of nearly 25% over 1910. During this period the number of telephones in the country grew from 13,650 to 87,000, so that telephone competition has been keen. It has had considerable effect on short-distance traffic in the closer-settled areas, but although the telephone is increasing so rapidly and the trunk system is extending in all directions, in many cases by the utilisation of telegraph wires, the statistics given show that it is doubtful whether the telephone will have the same effect on the telegraph as it has had in Great Britain. Numerous reasons, such as the increase of multiple shops in all classes of trading, are said to be responsible for the decline of traffic in Great Britain. These conditions do not exist in South Africa, and all kinds of businesses with branches in different towns use the telegraph freely. Government Departments, both Union and Provincial, find the telegraph indispensable in administering the affairs of the country, and it is used by them as is never done nor is necessary in England. The growth of Press traffic has been mentioned. This traffic is exclusively handled by the Administration, and likely to remain so, as there are no private newspaper wires. Distances being great, and average train speeds, with corresponding postal facilities, much slower than in the old country, the telegraph holds its own in regard to medium and long-distance traffic. And even with a development of aerial mail services, which is likely in the future, present indications are that it will continue to do so, and that fluctuations in the volume of traffic will be due to the state of business and not to absolute loss. Changes there will be, both in apparatus and in conditions, witness what has taken place even in the last five years, and it is not safe to prophesy, of course, but provided that a fair balance is kept between the two branches of the service, and attention given to the needs and requirements of the telegraphs, there is every prospect of their remaining what they are, a very necessary factor in the economic life of the country, and an efficient part of the communications of South Africa.

OBITUARY.

MR. W. STURMAN.

IT is with deep regret that we record the death of Mr. W. Sturman, late Overseer, which took place in May shortly after his retirement from the Service. The operation, from which he did not recover, was performed so pathetically soon after his retirement, that he was not able, for one moment, to sit back to enjoy the comforts of the armchair which was presented to him by the staff on the occasion of his well-earned retirement. Throughout the 43 years of his service he performed his duties with a devotion so characteristic of a good-living man, while his kindly and sympathetic nature engendered a deep affection amongst the whole of the staff.

"He fought his fight, which is acclaimed well done!"

MR. W. J. CLOUGH.

ALL ex-National Telephone Company men who have served in the Liverpool and Manchester Districts will be sorry to learn of the death of Mr. W. J. Clough, Clerical Officer.

Mr. Clough retired under the age limit in February last, he had been in very poor health for some time and was recently removed to the Baguley Sanatorium, where he died on Sept. 6. He was buried at the Southern Cemetery, Manchester, on 10th idem, many of his old colleagues paying their last tribute by their presence.

THE HOP EXCHANGE SUNSHINE FUND.

THE sixth annual outing for the poor children of Southwark was held on Saturday, May 28.

Four chars-a-banc loads of excited youngsters were conveyed to Eastcote, where they were turned loose to play amongst the wild flowers in the meadows or to revel in the merry-go-rounds, swingboats, coker-nut shies, and all the other amusements to be found there.

After a very good tea, which was served in the pavilion—and to which everyone did ample justice—races were run and Tug-o'-war "heaved."

The prizes, numbering sixty, were presented to the winners by the Chief Supervisor of "Hop."

On being marshalled for the return journey each child was given a bag of sweets, which did not in any way deter them from exercising their vocal powers, although, at times, their articulation may have been somewhat "slurred."

So: back again to the bricks and mortar, tired but very happy; although not as comfortably seated as before owing to the space which had to be found for the huge bunches of buttercups, &c., which "must be taken home to mother."

Could all those who subscribed to the fund have witnessed the pleasure and excitement of these kiddies, into whose lives so little pleasure ever comes, they would have felt amply rewarded for their generosity.

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ON A VISIT TO "TANDEM."

THE impressionist on entering the room would be struck first of all by the silence, then by the seeming immobility of the seated figures, and lastly, by the alert expression on the faces of those same figures.

Closer observation might disturb slightly the first two of these impressions but the general effect would remain.

Yet this quiet room is a symbol—an incongruous one without doubt—of the machine age. It is for London the "Alpha" of what has become known as the Automatic; whether the "Omega" will ever be reached is doubtful, as "in the bright lexicon" of the technician there's no such word as finality.

It is now a commonplace that telephone subscribers on visiting an exchange for the first time are surprised by the quietness with which everything is done. Here the quietness is superlative. Occasionally a whispered voice; occasionally the click of a key—that is all.

Somehow this quiet atmosphere cannot become associated in our minds with machines. We expect noise and tumult. Perhaps it is an allegory. The noisiest revolutions in history have often been the shortest-lived; the quietest have been the most deeply-rooted.

A neat, dustless table, a few keys, a few points of light flashing, a deft movement of the fingers by the operator—and the tiny lamps tell that the genie of the machine which the moving fingers have summoned has performed its task. If one could only think of it as an abstract proposition what a wonder it is.

Then we have unfolded strips of papers marked with short longitudinal lines in groups of seven. From the comparative lengths and spacing can be judged the efficiency of the finger-work at each of the neat tables. To the question "Do you preserve these as a reminder of the sins of the past?" how relieving to be told, "Oh no, I wouldn't be so cruel." Otherwise it would indeed have been a case of recalling the frailties of youth to chasten the pleasures of success.

In the basement are the robots of the new service. Here there is a little more sound, but more a restless click-clack than a noise. All these orderly rows of selectors and other ministers who do the will of the machine, the thousands of neatly laid-out wires, the shining wiped joints of the massive cables, the huge cells which speak of hidden power, have an inanimate beauty—a beauty of use rather than art. There is in this great hall the wonderful material of a new MacAndrew's Hymn could we find our Kipling to give it voice.

And even machines cannot live unto themselves. They require the human touch and care and interest. The engineer tells with pride of its planning and building up. The chief supervisor shows delightedly the best of her observation records. The traffic superintendent, when it is suggested that he must have enjoyed it all, answers smilingly that he would not have missed it for anything.

It is a fascinating place. J. F. S.

PRESENTATION TO MR. G. J. CLARK.

MR. G. J. CLARK, Assistant Traffic Superintendent, South Wales District, was the recipient of gifts in the form of a camera, bowls bag and presentation Eversharp Pencil, on the occasion of his retirement on Aug. 31, on reaching the age limit, after a period of 44 years Post Office service.

The esteem in which Mr. Clark was held was indicated in appropriate speeches by Mr. Waite, District Manager, who made the presentation, Mr Marsh, Traffic Superintendent, Mr. McDonald, Traffic Superintendent, Class II, and other members of the staff. The hope was expressed that Mr Clark will have better health to enjoy his well-earned leisure.

Mr Clark suitably responded.

TELEPHONE NOTES.

FOG flying experiments with the leader cable system, says *The Electrical Review*, are now in progress at the Royal Aircraft Establishment, Farnborough, and the scheme is now being tried on a large scale in the Woking-Basingstoke area with five miles of cable laid in the form of an oval within the aerodrome. Two sides of the oval are nearly straight, and along one of them is an auxiliary cable giving a signal of a different frequency. This indicates the area around which a landing can be made with the greatest ease. The aircraft is fitted with two search coils in the wings connected with an instrument in the cockpit, which tells the pilot, by means of oscillating lights on vertical scales, whether he is to port or starboard of the cable. The newer instruments have enabled the amperage to be reduced to 50, the horse-power to 3 per mile, and they are sensitive to signals from a height of 1,500 ft. downwards; they are, in fact, so delicate that they respond to a signal of 0.005 microwatt.

* * * *

As the result of successful trials, direct telephone communication between Prague, Stuttgart, and Paris has been established, and a regular service has been opened. Tests are now being carried out between Paris and Budapest, the underground cable between Paris and Vienna being utilised, and then the overhead wire between Vienna and Budapest; so far the tests have been considered quite satisfactory.—*The Electrical Review.*

* * * *

A new automatic telephone exchange at Stratford, New Zealand, has been completed by Siemens Bros. & Co., Ltd., Woolwich, and was lately opened. The exchange has an initial equipment for 600 ordinary lines and 50 rural and party lines with an ultimate capacity of 900 and 100 respectively. The exchange equipment includes a two-position manual board and a one-position test deck. The automatic equipment is the No. 16 type with several novel and interesting features, which include revertive calling on 4-party lines and special signalling arrangements for the rural lines. *The Electrical Review.*

* * * *

The first automatic telephone exchange in Egypt, says *Telephony*, has been completed by Siemens Brothers & Co., Ltd., London, and is now in operation. This exchange, named Ataba, is situated in the important town of Cairo and serves a busy commercial area where the telephone traffic is exceptionally high and is complicated by reason of the problem of mixed languages.

The dial switches of the telephones bear numbers in Arabic and English.

* * * *

According to *Telephony*, impatient users of the telephone are to receive prompt punishment in Paris. Calls are to be numbered as they arrive at the exchanges and will then be dealt with in order.

If a subscriber grows impatient and agitates the hook, thereby distracting the attention of the operator, he will lose his turn and his name will be placed at the bottom of the list. H. J. E. S.

IMPRESSIONS.

BY J. R. RAMSAY, *Contract Officer in Training, Glasgow.*

MY impressions were formed during instructional visits to different subscribers with another contract officer, while in training as a contract officer. I was primarily impressed with the comparative easiness of dealing with subscribers apart from commercial canvassing. There still appears to be some hostility on the part of certain classes of the public when approached with agreements which entail payments in advance.

During the course of conversation between the contract officer and the "prospect," I was impressed by the psychological atmosphere created, and saw how simply the members of the public could be brought to realise difficult points.

I suggest that to become a successful contract officer one must have a goodly share of personal qualities, coupled with tact and diplomacy, and to be capable of conversing intelligently and sympathetically, if necessary, with prospective subscribers who show signs of amiability. The human factor, no matter how difficult, can undoubtedly be brought to bear on negotiation and the "prospect" brought to appreciate and accept the views or ideas of the canvasser, by the application of practical psychology, patience, and determination, bearing in mind always not to force arguments which may undermine one's chances of success. It will be readily observed that the general deportment and manner of the canvasser will have a great effect upon his or her work, and on no account should there be any lapse into an attitude of "ennui."

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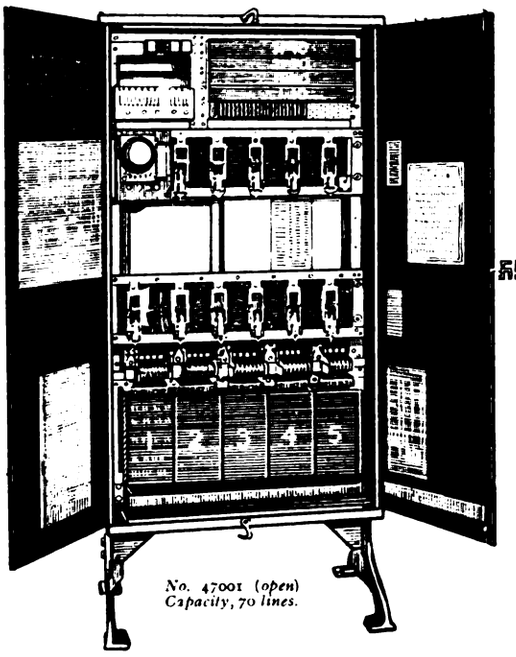

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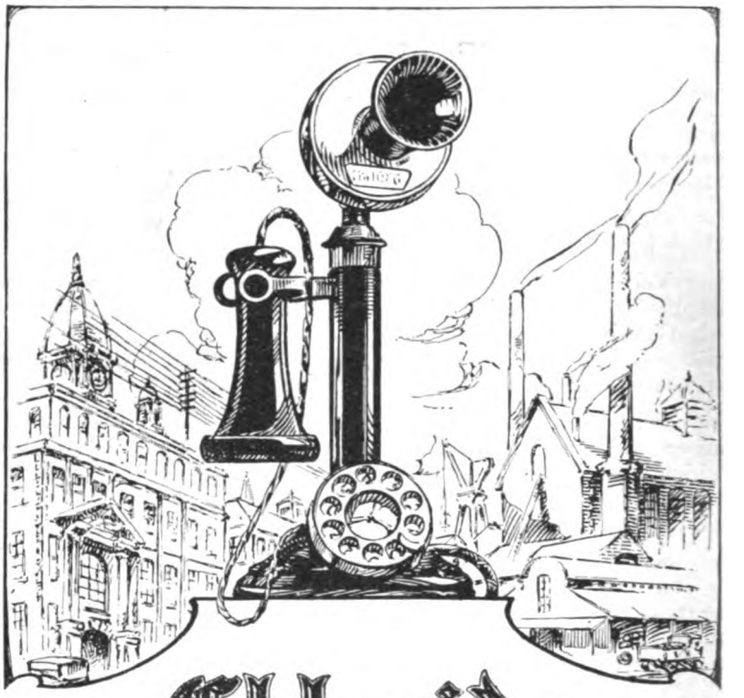

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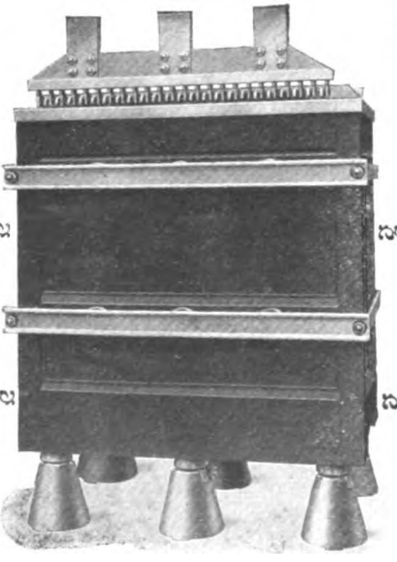

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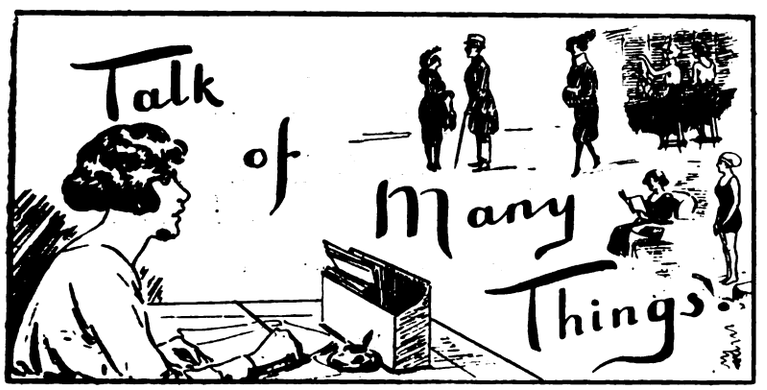

Who is Sylvia?

THE gracious compliment so neatly conveyed in verse by "D.D. of Central" put me "all of a twitter," and I am blushing still.—[Is that why you wrote this in red ink?—ED.]—I have out-crimsoned the rambler and have uprooted the beet, and for the moment I don't know where I am, let alone who I am. I ought to reply in verse, of course, but as there is generally neither rhyme nor reason in what I write, verse is clearly out of the question. I cannot tell a lie. I am not the P.M.G. By that I don't mean that the P.M.G. can or does lie or that if I were the P.M.G. I could or would lie. With regard to the question as to whether I deal with subscribers' accounts, all I need say is that I have too much trouble with my own to want to be bothered with those of others. At the present moment my finances are T.O.S. and my bank account is O.C.B. According to some I am benighted, but I am not yet a Sir, although there is nothing a miss about me.—[No puns, please.—ED.]—This is as near as I will go to reveal my identity. I have to be cautious, you see, because when I last confessed, the anxious enquirer promptly presented a final demand for income tax. "Where ignorance is" miss, "'tis jolly to be wise"—or words to that effect.

I am delighted to feel that I have been the means of removing D.D.'s Double Depressions—I presume that is what "D.D." signifies, unless she is a Doctor of Divinity—but if she knew me or even met me they would return. Then, of course, she would "register" grief and pain.—[I've warned you once about puns, P. F.!—ED.]—It's thrilling, however, to think that perhaps we may have met. Possibly we have been together in a District "jam" and I may have trodden on her foot. If so, I apologise now, because doubtless I was too breathless to do so at the time. Perchance we have jostled in Woolworth's, or she may have seen me standing stork-like and utterly bored in a ladies' hat shop in Oxford Street pondering the inner truth of the words "they also serve who only stand and wait." Yes! perhaps all these things, and yet we have not recognised each other. Isn't it tragic? Let us take heart, however. Because of your curiosity, D. D., this column has been enriched with your verse. Send a poem every month.

PERCY FLAGE.

"Lines" to "Tandem."

A simple fact, dear colleagues all,
A great invention, too—
So turn your minds from bat and ball,
Or going to the Zoo.
For telephones are up to date
And speculation's rife and great,
But do not judge at random
The working of new TANDEM.

Keys are depressed by maidens fair
And junctions are allotted;
Then eagerly, with greatest care,
The numbers are all spotted.
Some may get lost, but what of that!
The Engineers are on them pat,
So do not judge at random
The working of new TANDEM.

But wait awhile, and you will smile
When all is working gaily,
And dockets *decrease* in the file
You used to wade through daily.
So cheer up all—do not be sad
For quite soon now you'll all be glad
You did not judge at random
The working of new Tandem.

And so tho' junctions get engaged
These days when we hus*band* 'em,
You must not fret or get enraged,
'Tis not the fault of *TANDEM*.

E. H. B.

A Telephone Romance.

A pretty wedding "Service" was celebrated at "Hornchurch" when Mr. "Rodney Fitzroy" led Miss "Primrose Hill" from "Croydon" to the altar.

The church was prettily decorated, the "Speedwell" predominating, and the "Selector" of these blossoms, Mr. "Colin Dale" stated that he gathered them in "Grangewood."

The Rev. "Kelvin" officiated, and the happy couple "Listened in" awe to the advice he "allotted" and placed great "Reliance" on his words.

The best man, Mr. "Frank Lyn," and his friend, Mr. "Harold Wood" (who travelled from "Willesden" and "Wallington" respectively), took up their "positions" early.

The bride, who had "Maida Vale" unaided, had been a ward in "Chancery"; she was attended by Miss "Ann Cillary," Miss "Fan System" and Miss "Mayfair." When proceeding down the "Central" aisle a slight "disconnexion" occurred, namely, the bride's "Edgware" became unfastened, and one of the guests, Miss "Mary Land," had to come forward and "Pinner."

The "Ambassador" for the "Admiralty" sent a "Telegram" from "Grosvenor" Square, near "Victoria," wishing the happy couple a "clear" future.

They left the church to the strains of "Oh, what will the 'answer' be?" and proceeded to "Waterloo," where they paid "Toll" for their three "Trunks." Here they entered a carriage "in error," labelled "Royal," but "cleared" out when they saw the "Guard Signal."

The journey to "Battersea" was very uneventful, and on the first day there they visited the "local" "Museum," which stood in a beautiful "Park" approached through an "Avenue" of trees.

On leaving the building, they met a "distant connexion" of the wife's, lately arrived from Canada, who gave them a "Canadian beam" and, as you can imagine, a wholesale "distribution" of "messages" followed.

(For further adventures of the happy couple, see our next issue.)

D. D., Central.

New Versions of Old Songs.

No. 3.—UNTIL. (To a visiting T.O.)

No glows on all the boards
Until you came—
No lengthy clears but those
You chanced to see—
No unrequited flash that you observed—
No clears, but you put all the blame on me!

No labels missing from the order-wires,
No failure of the staff to time subs as they ought—
No truant ticket lying on the floor,
But you took note, and entered it in your report!

T.O.'s loom ever in my fevered dreams—
Their eyes scan fiercely everything in sight—
No matter how preposterous it seems,
They are convinced that everything they write is right!

C. A. S.

The Telephone Play.

Some misapprehension has probably been caused by the description of the Telephone Play as printed on the membership cards of the London Telephonists' Society for the forthcoming session, on which, by inadvertence the word "musical" was deleted—but only by inadvertence. The play *will* be a musical play, in which we hope again to hear the voices of our accomplished artists, Miss Street and Mr. Hemsley, and the bright and tuneful singing of our Telephonists' chorus.

Contributions to this column should be addressed: THE EDITRESS, "Talk of Many Things," *Telegraph and Telephone Journal*, Secretary's Office, G.P.O. (North), London, E.C.1.

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LONDON TELEPHONE SERVICE NOTES.

Contract Branch.

THE volume of business done by the Contract Branch during the month of August was as follows :—

New business obtained	6,220	stations.
Ceasements	3,539	„
Net gain	2,681	„

The net gain for August last year amounted to 2,816, and that for August, 1925, to 2,988, so that this year's figure cannot be regarded as satisfactory, but its smallness is mainly due to the general complaint that business is slack and suffering from the effects of last year's industrial disputes.

Superstition is not yet dead in this 20th century London of ours. The other day a contract officer came across a subscriber who refused to sign forms of any description on a Friday, owing to superstitious fears. It is understood that this same subscriber invariably refuses to pay his accounts until he receives a final notice, but there is no evidence to show whether this is due to superstition or a Northern ancestry.

In the May number we referred in this column to the strenuous game of Kiosking, which is now being played all over the country, and especially by members of the London Contract Branch. At that time the number of Kiosks in London amounted to 474, but the number has now increased to 634 and Advice Notes have been issued for the erection of another 114.

On the whole, it is thought that this progress is fairly satisfactory, considering the large number of local authorities and other bodies involved. At any rate, it indicates that the number of Kiosks actually in use in London has increased by 33⅓% in the last five months.

Mr. J. P. Bissell, Clerical Officer, attached to the Western Contract Office, was married on Saturday, Sept. 10.

His colleagues in the Office and friends presented him with a handsome case of cutlery, on which was a silver plate suitably inscribed. The presentation was made by the District Contract Manager.

* * * *

Football Notes.

It was a happy decision on the part of the considerable and increasing number of cricket enthusiasts to push on with the formation of a Football Club before the pleasing atmosphere created by the Cricket Tournament had evaporated.

For the present, at any rate, only one team will be run by the L.T.S. The range of selection for football players is less extensive than for cricketers, due, no doubt, to the "youthfulness" of the L.T.S. male staff. Already one practice game has been held, and perhaps two others will be arranged before the League tournament opens.

The Contract Branch is likely to be well represented in the team, but there is room for others, and if more than sufficient players are forthcoming for one team efforts will be made to fix up additional team matches. The ground and accommodation, which includes baths, have now been finally settled at Raynes Park, and the following is a list of the engagements for September and October :—

Sept. 20	Possibles *v.* Probables ...	Trial game.
„ 24	Borough Polytechnic ...	Away.
Oct 1	National History Museum	At Raynes Park.
„ 8	Middlesex Hospital ...	Away.
„ 15	Fixtures not yet arranged.	
„ 22		
„ 29	Colonial Office	Away.

As previously announced, the Club will play in the Civil Service League. The honorary membership subscription has been fixed at 2*s.* 6*d.*, and it is hoped many members of the Contract staff will join the section.

* * * *

Bowling Club.

With the 1927 season at an end it may be of interest to place on record the results of the Club's first year. It was ambitious to enter for the Banbury Cup Competition, especially as the number of active members made it difficult to turn out at full strength on all occasions. Six matches were played, two being won and six lost. It was a great distinction to inflict defeat upon the cup-holders, the C.T.O. The other victory was over the Cavendish Club, whilst the defeats were at the hands of A.G.D., L.P.S., S.B.D. and L.E.D. The margin of defeat was very narrow in each case, and the total number of shots scored by the L.T.S. in the competition was 318, against 351 scored by their opponents.

The results warrant every confidence in the future, and players of the game are urged to get into touch with the Captain, Mr. P. J. Mantle, or with the Hon. Sec., Mr. J. E. Collins, 14 Gilpin Avenue, East Sheen.

With a larger membership it will be possible to arrange a fuller programme for next season.

* * * *

Tennis Competition.

Unfavourable weather and holidays have delayed the progress of the competition for Miss A. E. Cox's Cup.

In the third round, Trunks (B) beat A.R.3 B., Kingston beat Central (A), Clerkenwell beat Hop, whilst the match between Avenue and Trunks (C) remains to be played. Trunks (B) will therefore meet Kingston in one of the semi-finals and Clerkenwell will meet the winner of Trunks and Avenue in the other.

The date and venue of the Final will be announced as soon as the finalists are known.

* * * *

Swimming.

The "Rana" Ladies' S.C. (Controller's Office) will hold their third annual gala at St. George's Baths, Buckingham Palace Road, on Monday, Oct. 10.

A very attractive programme has been arranged, which includes the Ladies' Breast Stroke Championship of the Civil Service.

Miss F. K. Nettlefold, Cornwall House, will be pleased to attend to applications for tickets.

PERSONALIA.

LONDON TELEPHONE SERVICE.

Promotions :—

Miss A. LIDDELL appointed Supervisor at Brixton Exchange.
Miss F. M. NIGHTINGALE appointed Supervisor at Riverside Exchange
Miss E. M. MELDRUM appointed Asst. Supr., Class I, at Hop Exchange.
Miss M. E. B. SMITH appointed Asst. Supr., Class II, at East Exchange.
Miss L. LEA appointed Asst. Supr., Class II, at Trunk Exchange.
Miss G. E. NEGUS appointed Asst. Supr, Class II, at Avenue Exchange.
Miss D. I. POOLE appointed Asst. Supr., Class II, at Victoria Exchange.
Miss N. F. M. CLIFFORD appointed Asst. Supr., Class II, at Clissold Exchange.
Miss A. D. RANSOM appointed Asst. Supr., Class II, at Avenue Exchange.
Miss E. L. FULLELIVE appointed Asst. Supr., Class II, at Gerrard Exchange.
Miss E. M. MARTIN appointed Asst. Supr., Class II, at Toll Exchange.
Miss W. A. BINDER appointed Asst. Supr., Class II, at Victoria Exchange.
Miss L. L. FLINT appointed Asst. Supr., Class II, at North Exchange.
Miss E. M. FULFORD appointed Asst. Supr., Class II, at Sloane Exchange
Miss E. G. RUCK appointed Asst. Supr., Class II, at Park Exchange.
Miss W. N. PROVIS appointed Asst. Supr., Class II, at Tottenham Exchange.
Miss M. L. HORNE appointed Asst. Supr., Class II, at Primrose Hill Exchange.
Miss M. EASTLAKE appointed Asst. Supr, Class II, at Regent Exchange.
Miss B. G. DUNKER appointed Asst. Supr., Class II, at Grangewood Exchange.
Miss M. E. RICHMOND appointed Asst. Supr., Class II, at Museum Exchange.
Miss H. BURKE appointed Asst. Supr, Class II, at Paddington Exchange.
Miss G. M. BAYLISS appointed Asst. Supr., Class II, at Paddington Exchange.
Miss E. A. HOOPER appointed Asst. Supr., Class II, at Bishopsgate Exchange.
Miss V. I. FRANKLIN appointed Asst. Supr., Class II, at London Wall Exchange.
Miss E. M. CARVER appointed Asst. Supr., Class II, at Holborn Exchange.
Miss E. B. ARCHER appointed Asst. Supr., Class II, at Western Exchange.
Miss E. PHEBY appointed Asst. Supr., Class II, at Park Exchange.

The Secretary has approved the following appointments :—

Captain W. L. C. RATHBONE, Executive Officer to Higher Clerical Officer.
Mr. A. E. HUTCHISON, Acting Executive Officer to Executive Officer.
Mr. P. W. FOLLETT, Clerical Officer to Acting Executive Officer.

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THE

Telegraph and Telephone Journal.

VOL. XIV. NOVEMBER, 1927. No. 152.

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TELEGRAPH AND TELEPHONE MEN AND WOMEN.

XLVI.

LIEUT.-COL. A. C. BOOTH.

LIEUT.-COL. A. C. BOOTH is, and has been for many years, the Staff Engineer responsible, under the Engineer-in-Chief, for the mechanism of the British telegraph system, overseas as well as Inland, and that responsibility could not be in more enthusiastic hands. He is himself an ex-telegraphist bred in Morse and Wheatstone traditions, but he was broad-minded enough, early in his career, to recognise the merits and potentialities of the Baudot multiplex system as used in France, and it is largely due to his initiative that "machine," or "printing," telegraphs occupy so prominent a place in the British inland telegraph system of to-day. To him we are indebted for the duplex method employed on multiplex installations and for many improvements in machine telegraph design and operation. Lt.-Col. Booth lives and moves in a world of machines. Their structure and idiosyncracies are open books to him, and possibly at times he wonders why other men, especially that body known as "dirigeurs," find machines which are so tractable in his hands at times peevish and fractious in theirs.

During the war, Lt.-Col. Booth served as second-in-command to Col. Sir Andrew Ogilvie, Director of Army Signals (Home Defence).

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TELEPHONES AND A REVOLUTION.

USUALLY a revolution in Portugal is of no moment to those outside political circles; sometimes we others are unaware of the occurrence until we read of it in the papers, and on occasions the first information has come from our home papers. That of February last, however, was a very serious affair and, in the opinion of those who should know, quite the most sanguinary in the history of the Republic.

When, in the very early hours of the third day of the month, the Chief Operator rang to inform me that a revolution had broken out, I was prone to regard it as of the usual type and was shortly again in the arms of Morpheus. It had taken but a few minutes to ascertain that, although the traffic was well within the capacity of the normal force on duty, some emergency staff had arrived without let or hindrance and that the streets were apparently safe and quiet. The British members of the staff were warned and the motor-car was brought round to the door.

Nothing further transpiring, we went to our Central Office some hours earlier than usual, the journey being made without incident. The trams were running and most people appeared to be going about their business in a normal manner. Our way, however, did not traverse the vicinity of the principal public offices, which, I shortly learned, were the centre of the movement. Enquiry showed that a military rising had taken place, the major portion of the troops stationed in the city being involved. The Civil Governor had been arrested or abducted, his offices, the Military Headquarters and the Post Office being in the hands of the rebels, as also was the railway on the north side of the river. At one or two points the troops remained loyal and turned down the various overtures made to them.

Towards mid-day the telephone traffic became quite out of control, but the girls rose to the occasion and kept going. A reconnoitre in the affected quarter showed that whilst the side streets were available for traffic, the main roads leading to the public buildings were occupied by armed rebels, who had cut trenches across them, erected barbed wire entanglements and mounted machine guns. Business houses began to close their shutters and send home their staffs, and the trams ceased running within the centre of the city. No mail was delivered and both the telegraph and the trunk telephone service, which are operated by the Government, were discontinued.

As the afternoon wore on our traffic died down and it was possible to rest the staff. Those operators due to go off duty were informed that if they chose to remain on the premises they could do so, the best arrangements possible being made to feed and sleep them.

In the meantime the outside staff had been sent home, as it was clearly impracticable to supervise them and there was risk of contact with the troops.

Desultory rifle fire had been heard during the afternoon, and we learned later that arms and ammunition had been issued to several hundred civilians, some of whom appeared to wander round at their own sweet will. This put a very serious complexion on the whole matter, as the streets, with armed irresponsibles patrolling them, obviously became unsafe, and particularly so after sunset.

I should perhaps here state that on the first sign of any disturbance of a political nature all taxis, private cars and motor lorries make a bee line for home to avoid being commandeered, and this was the case in the present instance.

As a precautionary measure I had put this Company's car in the garden of the Oporto British Club, a couple of hundred yards from the office. It was thought that there was some risk in sending it out with the chauffeur alone, and I therefore decided to go in it myself to obtain the necessary rugs, blankets, &c., for the staff. A Union Jack was flown on the bonnet of the car, and although challenged at various points by the rebels a plain statement of my nationality and position evoked on every occasion a courteous permission to proceed. We made a point of using the main streets in an open manner, and although one rifle or machine-gun bullet hit the ground a few yards in front of the car, I am of opinion that it was a stray shot only and not intended for us.

For the remainder of the period we used the car as necessity arose, but always with one of the British staff in it, and I think that, apart from those actually in use by the military, our Austin was the only motor-car to be seen on the streets.

Matters became very quiet towards 8 p.m., and from the nature of the parleying which went on over the various lines a number of girls decided to go home for the night, those living close to the office taking with them as many companions as the sleeping accommodation at their homes would allow. In this way the strain on our own resources was relieved.

The night passed quietly enough, but Government forces began to congregate on the south side of the river. Communication over the bridges and by boat was prohibited at an early hour. The opposing sides swept opposite ends of the bridges with machine gun fire and persons attempting to cross the river by boat from the north were subjected to independent rifle fire from the rebels.

The Government forces dropped an occasional shell round the rebel headquarters, but without doing much damage.

At about 8 a.m. on the 4th a number of wounded civilians were carried past our office, from which it was clear that the matter had got beyond the firework stage.

Round about the usual time those girls who had gone home for the night turned up all serene and smiling. One bright damsel commandeered a Red Cross motor ambulance, which brought her along in state.

From 9 a.m. onwards traffic began to pile up very heavily, obviously due to a desire to ascertain or discuss the progress of the movement.

About 10.40 a.m. some bullets from a misdirected machine gun penetrated our switchroom skylights, and this very naturally caused a panic. Quickly ascertaining, however, that there were no casualties, we rallied and chaffed the girls into resuming their work. Some had not attempted to leave their positions, but the general circumstances had predisposed one or two to hysteria. These we led to lower rooms, where shortly they recovered and on their own initiative returned to their places.

By midday practically every business house was closed and the streets were deserted, our traffic requiring only one-third of the normal force. For some hours hardly a soul was to be seen in any of the streets visible from our windows. An occasional wayfarer might be observed gliding from doorway to doorway or scuttling from point to point probably making for home or for some place of fancied security.

Beyond desultory firing in various directions the night passed without incident if we except an occasional bullet through the skylight. Instead of being alarmed on these occasions the girls made scrambles to secure them as mementos. Those operators not required for duty camped out on the floor of the inner rooms below.

On this night we received several messages from rebel headquarters to cease service on various lines. We accepted the messages but ignored them.

Advantage was taken of the darkness to obtain provisions from shops close by, whose proprietors lived on the premises and who were only too pleased to sell what we required and at the usual prices.

On the morning of the 5th the police station a little below our premises closed its doors, the staff going away. At about 10 a.m. our most southern sub-exchange was taken over by the Government troops arriving from Lisbon, and a little later the

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exchange two miles south of the river followed suit. We learned that during the night large forces had come up by train, bringing with them heavy field artillery, which took up positions of advantage on the south bank of the river.

A meeting of responsible British residents had been arranged by the Consul for 11 a.m., but I had no sooner reached the Consulate, some 200 yards away, than I was informed by 'phone that rebels had entered our place. I immediately returned, to find a lieutenant and six armed soldiers had taken possession. They caused some consternation in the switchroom, but on request withdrew to the lower floors. The officer was not at all sure as to the object of his visit. He talked wildly about turning us all out, but after I had pointed out to him the ridiculousness of such a proceeding, he quietened down and contented himself with posting two of his men at the street door. He was not a very cheerful soul, and from his talk not hopeful of the result of the rising. He seemed to know very little of what was happening and went very down in the mouth when told of the massing of Government troops on the south side. As this information was already in the newspapers, though he had not read it, there was no breach of telephone confidence in giving it to him. If I added a nought or two to the number of troops or a few millimetres to the size of the guns, it was worth while, as he sent the information by hand to his headquarters.

During the afternoon he conceived the idea that it would be useful to listen to the conversations passing over the lines in use by the Government forces, but I declined to permit this. I pointed out that, being a British concern, we had no interest other than to give a telephone service to all our subscribers, irrespective of their politics or of the particular side which they supported. He became somewhat truculent at this, but I maintained the attitude that it was service for all or for none. As the staff had already intimated that they would decline to accept orders from other authority than myself, I felt that I was on safe ground. He began to talk wildly about what he would do unless facilities for listening were afforded, and eventually I asked him if he had any knowledge of international law and usage. This was too much for his pessimistic mood and, perhaps seeing visions of the British lion aiding the Government troops, he quietened down and troubled us no more. (I must here admit that I have no knowledge of international law.) In casual conversation afterwards he endeavoured to convince me how good a thing it was for us that he was there to look after us. I let him think so.

Truly, matters savoured of Gilbert and Sullivan.

By 5 p.m. the Government troops had got some of their heavy artillery into position and began to try the range. The screams of the shells as they passed high overhead were rather terrifying to begin with, but by the time it was dark we had become accustomed to them. One of the first shells carried away the major portion of our aerial route to the sub-exchanges on the western side, together with a number of subscribers' lines. Needless to say, we gave no thought to any attempt at repair.

The evening editions of the newspapers were full of "the ruthless savagery of the Government troops," but as they had been censored by the rebel H.Q. it may be assumed that all their information was inspired. They were throughout very complimentary to the telephone staff.

On this night the heavy guns were to be heard every few minutes, but as no shell came near us we passed a not too nervous time. Coffee in the small hours is a good reviver of spirits.

At about 2 a.m. on the 6th, Sunday, we were informed that the newspapers had been instructed by the Minister of War, who commands the Government troops, to publish a warning, advising the population to remain indoors from 9 a.m. It was his intention to bombard the city at that hour. This, of course, was not a cheerful prospect and some of the girls wanted to go home. One could not blame them; but I advised them to wait for daylight, which they decided to do, and they settled down again to get what rest they could. In the meantime I turned the matter over in my mind. The situation was certainly serious. As the central exchange serves both sides of the river, to close down would deprive the Government (and rebel) troops of their telephone service. To hold the girls and risk casualties was a course not lightly to be taken. However, in conference with one of the local directors who was sleeping at his office a few doors away, it was decided that we would persuade the girls to stay, if we could do so, but offer no objection to those who insisted on going home.

I then talked over the matter with the Chief Operator, who expressed her intention to remain under any circumstances unless I sent her away. We afterwards approached the remainder of the staff, all of whom decided to remain, with the proviso that should they change their minds at a later hour they would be free to leave. To this there was not the least objection, you may be sure. Those who had announced their intention of going home hung about in a state of indecision for some time and finally stated their intention to remain. No calls of any moment were passing at the time and so, neglecting the service for a minute or so, we had a little talk. I told them that I thought they had made a right decision in electing to remain, and I expressed the opinion that should bombardment actually take place we might be as safe here as elsewhere. The Government forces knew just exactly where our building was and had intimated that so far as possible they would avoid shelling our immediate neighbourhood. It was pointed out that casualties and fire might result from the shelling, but without a telephone service the work of ambulances and fire brigades would be very seriously hampered. I also reminded them that the thing had lasted longer than most other disturbances and that the end could not much further be delayed. This talk had a good effect, and when the newspapers appeared announcing that the bombardment would take place from 9 to 10 a.m. very little interest was displayed, although as the hour drew nearer there were not many smiles to be seen. However, it passed without incident, and there was a general feeling of relief. The soldiers who, in their way, had taken charge of the building were missed about 9.30, but I gather that on the arrival of the newspapers, about 7.30, they decided that there were healthier spots than our premises, and without "By your leave" or "Good morning" they vanished.

Our information was that most of the principal rebels were making tracks for Spain. Rifle and machine-gun fire continued intermittently throughout the day, but the heavier guns were silent. We understood that the terms to be asked by the rebels were unlikely to be entertained; it therefore seemed clear that the movement would last another day. At 3.45 p.m. the Minister of War announced the turning down of the rebel proposals and his definite intention to bombard at 4 p.m. Precisely at this hour the racket commenced. Being directly in the line of fire of two guns, but much below the level of their objective, from our windows we could actually see the shells falling in the neighbourhood of the rebel headquarters. Traffic at the boards was practically non-existent, but the girls remained seated at their positions. Some tears fell, but the supply of handkerchiefs was equal to the occasion. After the first few salvos, smiles took the place of the looks of apprehension and we carried on.

There was, however, evidence of some damage, and we could see that the roof of the Post Office building was in flames. The fire brigades had moved their apparatus well away from the centre of the town, but, when called, lost no time in getting to work, in spite of the continued firing. Ambulances also drove up to the scenes of casualties and brought away a number of injured.

After an hour of shelling the firing ceased, and parleying again took place. Apparently the rebels were still dissatisfied (or unsatisfied), as an exchange of salvos every few minutes occurred from 6 p.m. After dark the larger guns spoke every 15 or 20 minutes, the rifle and machine-gun fire continuing intermittently as before throughout the night, defeating all our efforts to sleep.

With the coming of day a little more activity was displayed by both sides. The newspaper reports and other rumours were

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rather alarming, giving the impression that the rebels were holding more than their own and that there were great prospects of reinforcements, but obviously the statements were inspired. The Staff got very down in the mouth and it was necessary to talk with them.

By 10.30 a.m. the Government commanders had made all their dispositions for taking the city that night, by storm if necessary.

A rumour circulated that a similar rising had taken place at Lisbon, but although this turned out to be true the fact that further troops had come up by train discredited it, at the time.

Business houses remained closed, the streets were still deserted and, although spasmodic firing continued, I deemed it safe to essay a visit to other exchanges and to my home. Although challenged when passing any military point, I was allowed to proceed in whatever direction I wished and eventually returned to our Central Office without the least difficulty. During my absence, however, a party of armed rebel police entered the building with an ex-employee of the Company, who showed them how to listen in at the test desks, to which he connected two or three Government lines. This upset the girls very much and they were disposed to leave the switchroom *en bloc*. The chief operator, however, persuaded them to remain at least until my return, which they expected every minute. On arrival I was informed of what had occurred. I saw immediately that the lines under observation were not the most important ones and that of the three observers one could not write and the others could do so but slowly. No cleverness is necessary to show that in the circumstances not much harm could be done. It takes a good trained shorthand writer to record an ordinary conversation, and it was impossible for these observers to listen and write at the same time. When I returned to the switchroom the chief of the rebel squad kept me under surveillance, presumably with the intention of interfering should I attempt to communicate with Government H.Q. I must say that the Government officials played up handsomely to the situation. Other lines were used for anything of importance and those under observation were used for fictitious talks and for any messages which it would be useful for the rebels to hear. Certainly some of the things they heard put their tails down very sadly.

Shots were now heard only very occasionally, and some hours passed without any of the bigger guns being fired.

The announcement of the Lisbon rising was passed round to various rebel positions, but fortunately none would credit it. I say fortunately, because had they believed the report (which was in fact quite true) they might have resisted for another day or two and this would have delayed the Government troops being withdrawn to Lisbon to put down the revolt there. In fact, it might have resulted in a complete victory for the rebels, both in Lisbon and Oporto.

Shortly after midnight the Government plans matured. The river was crossed. Loyal officers took charge of the various barracks and the rebels were made prisoners. At 2.30 a.m. the Republican Guard turned out for street patrol work and the revolution was over, having lasted 5 days and 5 nights. The normal night staff being sufficient for the traffic passing, the rest of us sought what sleep we could get in the hours left to us before the opening of a day which was expected to be exceptionally busy. And it was so.

The few male staff who were required remained on duty throughout, and by their calm demeanour and constant presence contributed very considerably to the smooth running of things.

It will be agreed that we have reason to be very proud of our people and of the way in which they stuck to their work. The case was quite different from a war, in which the whole country fights a common enemy. Further, it embodied the fact that the side which comes out on top becomes the Government, hence an attitude devoid of partisanship was the only one proper to the occasion.

Our colleagues in Lisbon had an equally exciting time, and although it did not last quite so long I feel quite sure that their ability to maintain the service would, like our own, have found its limit only in the destruction of the apparatus, or in the use of brute force. Obviously it would have been futile on our part to attempt physical resistance to armed force and such a course never occurred to us. A smooth tongue and some imagination carried us through the events without casualties, and for such mercies we were very thankful.

H. A. H.

PROGRESS OF THE TELEPHONE SYSTEM.

THE total number of telephone stations in the Post Office system at Aug. 31, 1927, was 1,557,389. The new stations added during August numbered 17,387, and the cessations 8,714, resulting in a net increase of 8,673 stations.

The growth for the month is summarised below :—

	London.	Provinces.
Telephone Stations—		
Total at Aug. 31	549,782	1,007,607
Net increase for month	2,544	6,129
Residence Rate Subscribers—		
Total	121,480	196,887
Net increase	1,022	1,826
Call Office Stations—		
Total	4,931	17,880
Net Increase	88	109
Kiosks—		
Total	623	3,035
Net increase	47	71
Rural Party Line Stations—		
Total	—	10,052
Net increase	—	32
Rural Railway Stations connected with Exchange System—		
Total	—	806
Net increase	—	10

The number of inland trunk calls dealt with during July (the latest statistics available) was 8,795,162, an increase of 435,673, or 5.2% on the figure for the corresponding month last year.

Calls made to the Continent during July numbered 24,980 and from the Continent 26,585, representing increases of 8.7% and 3.2% respectively over July, 1926.

Further progress was made during the month with the development of the local exchange system. New exchanges opened included the following :—

LONDON—Fulham, Frobisher (theoretical exchanges on the Western Manual Exchange); Prospect (theoretical exchange on the Richmond Exchange).

PROVINCES—Amersham (Relief), Hereford (Strowger Automatic), Govan, and Preston, Lancs (Relief);

and among the more important exchanges extended were :—

LONDON—Chingford, Edgware, Erith, Harrow, Hornchurch, New Cross, Reigate, Riverside, Tottenham.

PROVINCES—Douglas (Liverpool), Falkirk, Hereford, Lark Lane (Liverpool), Malvern, Old Swan (Liverpool), Scarborough, Wavertree (Liverpool).

During the month the following additions to the main underground system were completed and brought into use :—

Westerham—Orpington (Section of London—Orpington cable).

Mansfield—Clown (Barlborough);

while 61 new overhead trunk circuits were completed, and 85 additional circuits were provided by means of spare wires in underground cables.

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AUTOMATIC TELEPHONY.

BY C. W. BROWN.

(*Continued from p. 9.*)

VIII.

DURING the period of transition from manual to automatic working the following services have to be catered for in a metropolitan area :—

(*a*) Calls from automatic exchanges to manual exchanges.

(*b*) Calls from manual exchanges to automatic exchanges.

(*c*) Calls between manual exchanges.

The methods adopted in the case of the London area are given in the following, which may be assumed to be representative of the most complicated case.

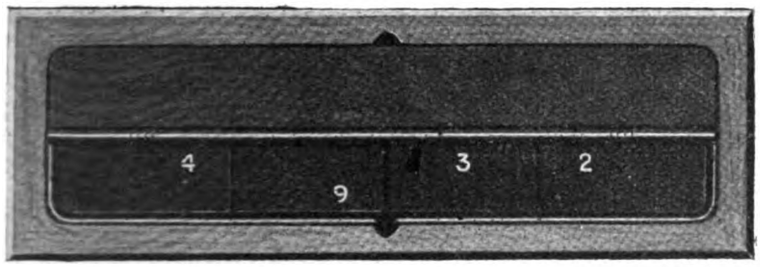

FIG. 1.

Automatic to manual.

In a non-translational area, calls from the automatic exchange usually pass via 1st, or 1st and 2nd, selectors, the calling party reaching a junction by dialling one or two digits, referred to as a "dialling out" code. The call is extended to normal junction calling equipment at the manual exchange and is operated on a manual basis. Such a scheme would be difficult to apply to a very large area on account of the large number of exchanges that will exist side by side with automatic exchanges. It has already been stated that the change from manual to automatic working will occupy several years. It might be thought that in the large city the case would be met by the automatic subscriber dialling the three letters of the exchange code and the call routed to the required exchange to be attended to on a manual basis. In such a scheme two methods of operating would exist, with confusing results. A definite slowing down of calls would occur due to the manual operation, which would be reflected in the number of junctions necessary ; the need for advising subscribers of changes as manual exchanges were converted to automatic working would require an expensive and difficult organisation. The fact that subscribers would be required to dial in order to reach an operator, whereas under manual conditions the operator is reached by removing the receiver, would not unreasonably be resented besides creating in the minds of subscribers an entirely wrong impression of automatic working.

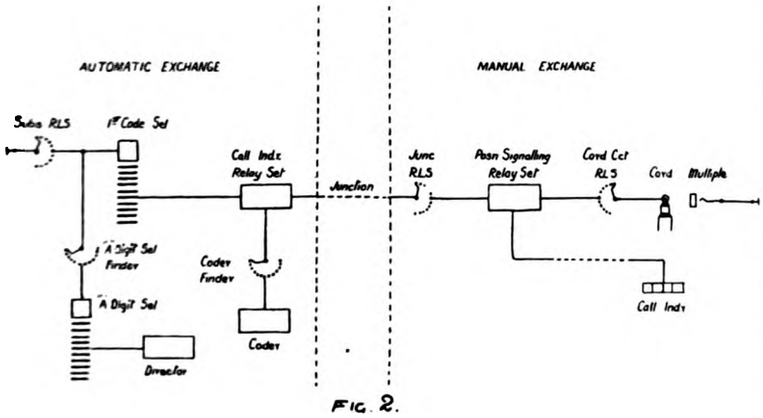

FIG. 2.

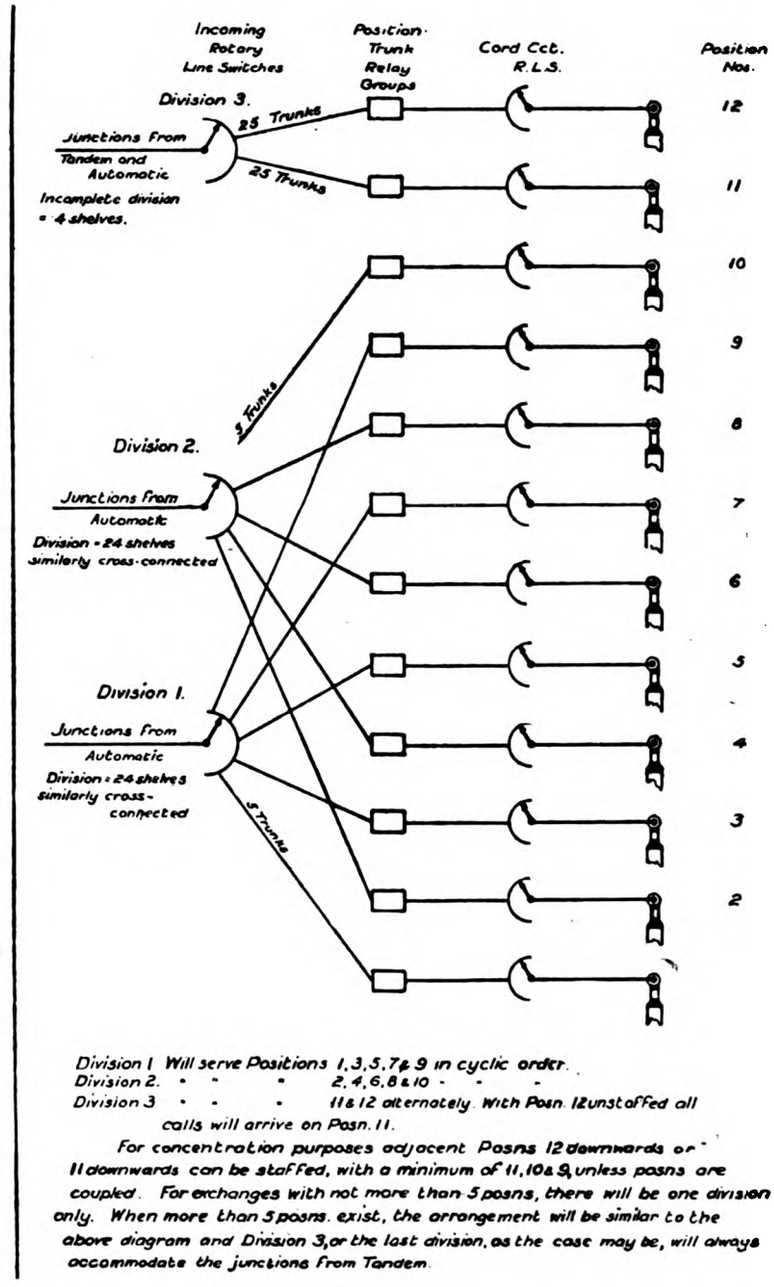

FIG. 3.

With a view to avoiding expensive and difficult alterations to existing manual exchanges and to reduce the quantity of switch equipment necessary, a "call indicator" system of signalling is used. By the use of this scheme, the numbers dialled by a calling party are received by the manual operator in the form of an illuminated "display" as shown in Fig. 1. The operator

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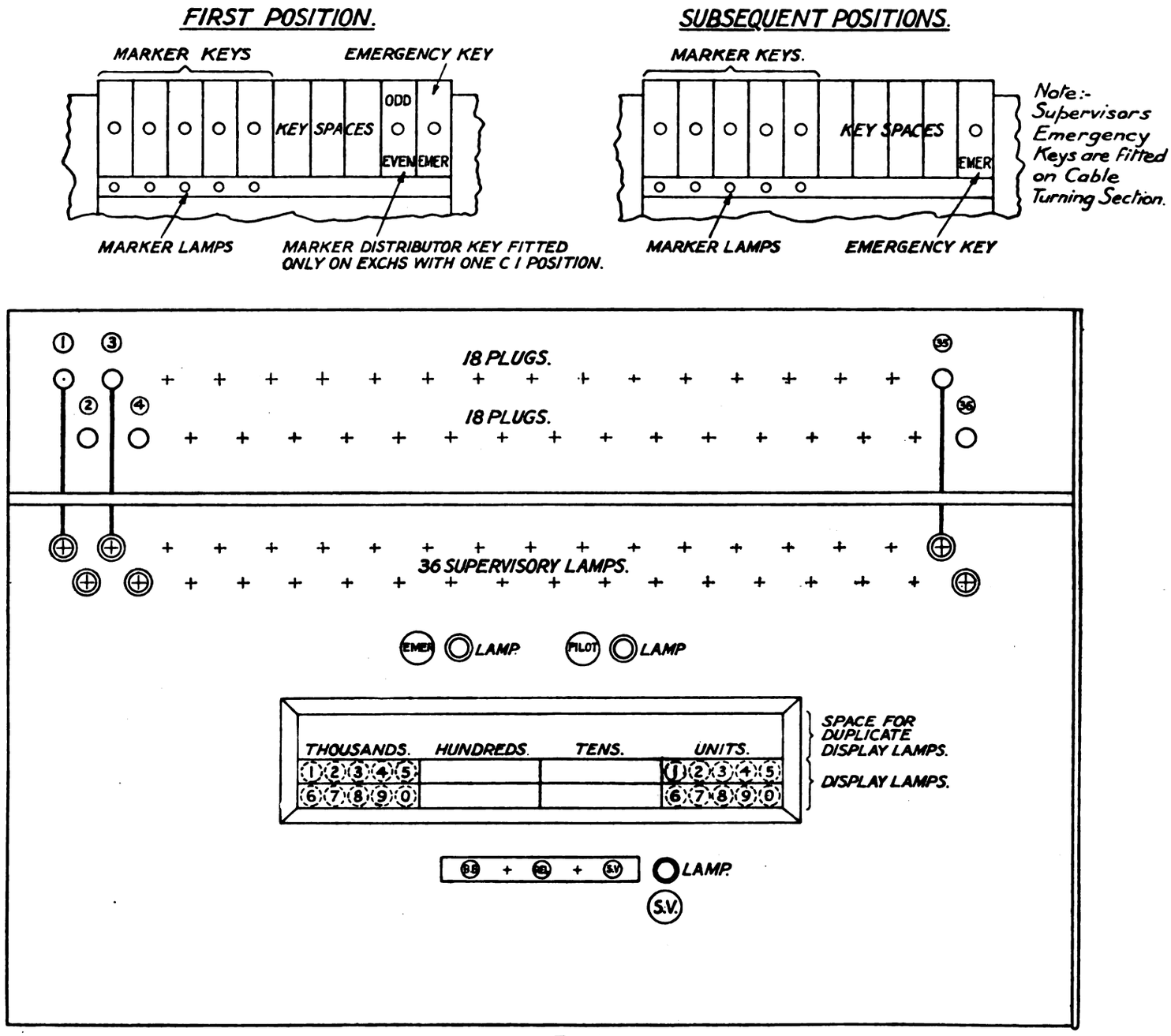

FIG. 4.

completes the call by inserting a plug into the multiple jack of the number displayed. The operator does not speak to the calling party, so that from his point of view the call proceeds as an ordinary automatic call, ringing tone being given when the plug is inserted in the required party's multiple jack.

To speed up operating, and owing to the absence of stepping equipment at the manual end, the standard Strowger impulses passed out from the Director do not pass over the junction, they are converted into battery currents having differing characteristics, before leaving the automatic exchange. A different current combination is assigned to each of the ten digits which are thus said to be coded. The battery currents pass over the junction, which has already selected the position into which the call will be routed, and operate relay equipment which " decodes " the call, setting up other relays that are responsible for lighting the individual lamps in the display panel. The call passes from the automatic exchange to the manual in just over a second. As the result of coding, the system is referred to as " coder call indicator " working.

Fig. 2 is a schematic diagram showing the disposition of the apparatus on such a call.

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With the scheme as applied by the Post Office, the junctions are terminated on standard line switches at the manual exchange, the bank contacts are connected to relay signalling sets associated with the manual positions (each position will accommodate 50 such relay sets). The cord circuits—36 per position—are not connected to junctions but are terminated on standard line switches, the banks of which are connected also to the relay signalling sets associated with the junction line switches.

The suite of positions is grouped into divisions containing five positions, and calls are automatically distributed in cyclic order to the five positions, thus providing for load equalisation. The positions are automatically closed to traffic when :—

(*a*) All cords are in use.

(*b*) When the position has five calls waiting attention and one call "displayed."

(*c*) When the operator's head telephone is not in the position.

Provision is made for storing five calls in the position, such calls are disposed of in cyclic order, so that the calls are, in effect, queued up for attention. Although the word "stored" has been used, the calls do not leave the originating exchange until the display apparatus is free to receive them. The calls actually "mark" the manual position that they propose to enter and place themselves in the "queue," discharging themselves from the automatic exchange when the "B" operator signals them to proceed. It is interesting to note that the "B" operator has no indication of the exchange from which a call originates.

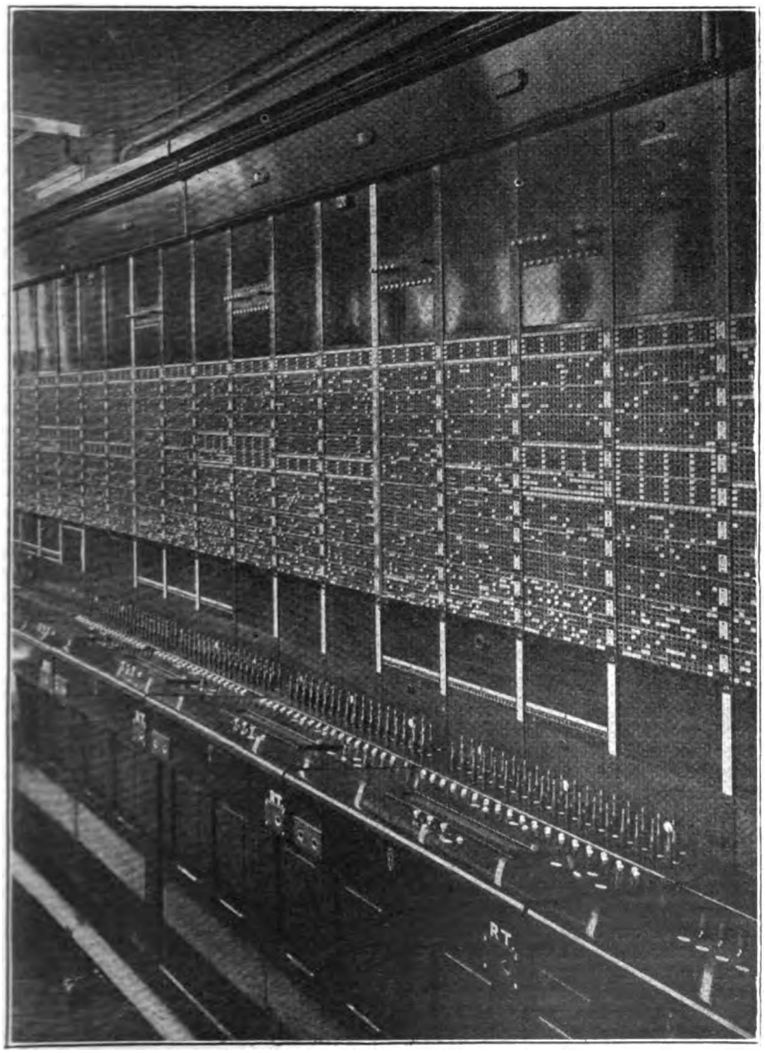

FIG. 5.

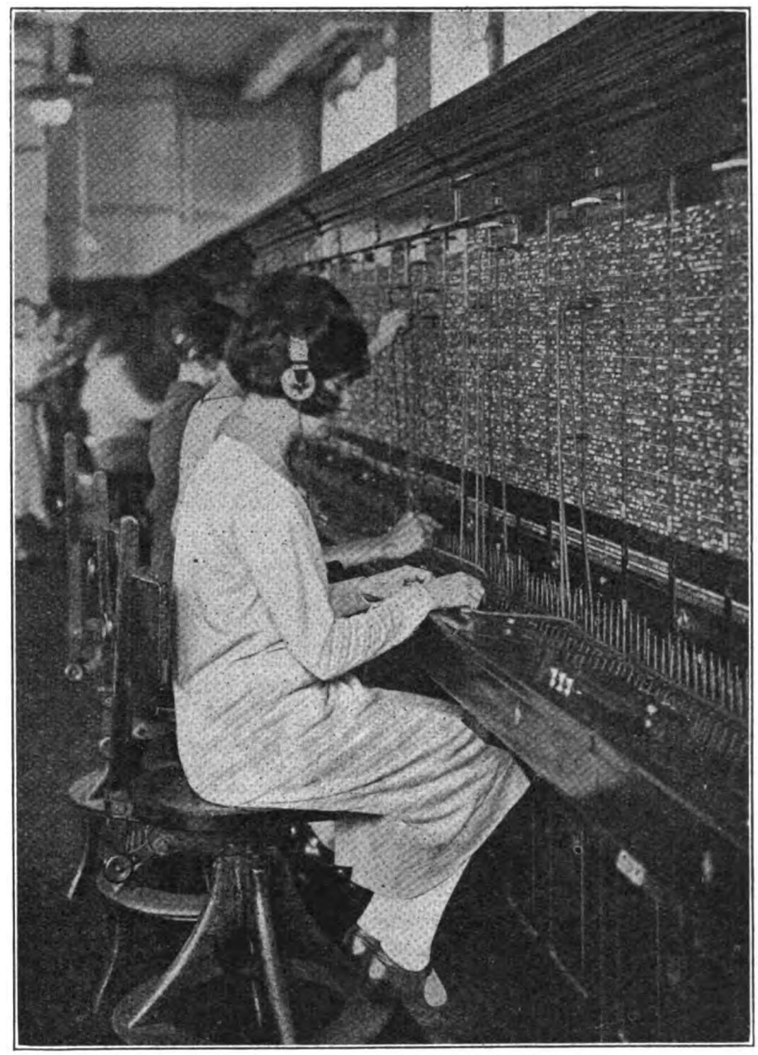

FIG. 6.

From (*c*) above it follows that the whole of the traffic in a division may be concentrated to one position by having only one head telephone in position. Also if adjacent positions are in different divisions, by keeping open one position per division the traffic for a large exchange may be concentrated to a few positions. The arrangement is shown schematically in Fig. 3. The feature is useful during slack hours and enables economy in staff without loss of efficiency to the service.

1. Amongst the many facilities provided are the following :—

Special keys are provided for (*a*) disposing of callers when the wanted number is busy, thus freeing the display and avoiding the provision of "busy back" jacks in the jack field—the busy signal is connected at the relay signalling set ; (*b*) for connecting callers to service points when service numbers are dialled, thus avoiding the use of cord circuits for the purpose ; (*c*) for disposing of calls that enter the position but, owing to faulty conditions, fail to "display." The key is used in conjunction with the service key and artificially completes the cycle of operations. Such cases are routed to service points.

2. Congestion signals are provided to indicate when a position is "full." Although, owing to the rapidity with which

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calls can be dealt with, the congestion condition is usually of very short duration, the frequent operation of the signal is an indication that further positions should be opened.

3. In event of a breakdown of automatic working, the position concerned can be worked on a manual basis, by the operation of a key. Under "manual emergency" conditions, callers enter the position but the display lamps do not light, the caller, however, is connected to the operator's receiver, the latter challenges and connects the required line in the multiple from any available cord. Under these conditions not more than two calls can be in a position simultaneously, one connected to the operator and one waiting, the waiting call is connected to the receiver immediately the previous call has been dealt with.

4. Positions can be automatically "routined," i.e., the decoding and relay signalling apparatus can be tested for correct functioning from the position.

Fig. 4 shows the face equipment of a call indicator position and Figs. 5 and 6 show a suite of positions unstaffed and staffed.

FIG. 7.

Manual to Automatic.

For this class of service, junctions from the manual exchange are terminated on selectors in the automatic exchange and two methods of operation are available. Calling devices may be provided on the manual positions, calls being passed direct to the selectors, or the junctions may be "teed" to B positions located at the automatic and order wire working adopted, the call being set up by the B operator. To prevent fatigue to the operator and to speed up traffic, key sending equipment is usually provided, the operator setting up calls by depressing keys, instead of operating a dial. Fig. 7 is a photo of a key set.

(To be continued.)

PRESENTATION TO MR. H. R. C. HICKISH, SOUTHAMPTON.

IN the presence of a large and representative gathering of the Southampton Telephone Staff, the District Manager, Mr. O. G. Lee, presented Mr. H. R. C. Hickish, Assistant Traffic Superintendent, with a handsome inlaid mahogany scroll clock on the occasion of his marriage.

Mr. Lee in a short speech said what pleasure it gave him to make the presentation and wished Mr. Hickish and the future Mrs. Hickish a happy married life.

Mr. A. L. May, Traffic Superintendent, Class I; Mr. J. W. Stelling, Traffic Superintendent, Class II; and Mr. D. Wallace, Contract Manager, spoke on behalf of Mr. Hickish's married colleagues and extended their best wishes. Mr. F. J. Tanner, speaking for the single members of the staff, wished Mr. Hickish "all the best."

In an amusing little speech, Mr. Hickish thanked the District Manager and those present for their very acceptable gift and kind wishes. Mr. Hickish has also been the recipient of individual gifts from Postmaster's and Engineering Staffs in the Southampton district.

OUR TELEPHONE SERVICE FROM WITHIN.*

BY A. E. COOMBS (*District Manager, Glasgow*).

Glasgow Post Office Organisation (Telephones).—AT the head is the Postmaster Surveyor, Col. Westbury, who has, under his general control, the Postal, Telegraph, and Telephone Services, each of which, for administrative purposes, is self-contained. At the head of the Telephone Branch is the District Manager whose department is organised in three Branches—Accounts, Contract, and Traffic. There is, again, the Engineering Branch which works separately and independently of the foregoing; the functions of this branch do not come within my purview, but needless to say, perhaps, in actual work we are closely interwoven and co-ordinated.

Accounting Branch.—The Accounting Branch deals with the rendering and payment of telephone accounts, with counter enquiries, issues of Telephone Directories, Call Office collections, and kindred matters. Approximately 130,000 accounts are rendered annually, divided evenly over respective quarters. I made a public statement last year that Glasgow compared favourably with other places with regard to prompt payments. It is a pleasure to confirm that statement although it is still necessary, unfortunately, to forward reminders to one out of every three of our subscribers. The telephone revenue of the Glasgow District is in a very healthy condition too, and is rapidly approaching the £750,000 (¾ of a million) per annum mark. This income is divided roughly into equal parts in respect of installations and calls.

Contract Branch.—The Contract Branch is, in effect, our Publicity Section. Amongst other things it deals with the extension of the service by the securing of new subscribers and improving the facilities of those already connected. This section is particularly concerned with development work. It is not enough that it should secure new business to-day but it must, through its experts, project itself into the future. The supplying of estimated telephonic growth figures on which plant, equipments, and buildings are provided in advance of immediate requirements, is not the least important of the duties of a Contract Officer.

Street Kiosks.—Another feature of telephone publicity is the fact that during the past two years one of the most remarkable aspects of development in Glasgow is the increased popularity of our Street Kiosks. There can be no doubt whatever as to the usefulness of these call offices, nor as to their stimulating effect on the telephone habit. First impressions were that the placing of these kiosks in our suburbs would mean that nearby residents would not bother to have the telephone installed in their houses. It is strange, but nevertheless true, that precisely the opposite has occurred, for wherever we install a kiosk in a residential position it tends to become a centre of intensive telephonic development in its immediate neighbourhood. We are increasing the number as rapidly as the necessary negotiations will permit, and during the past few years have improved those already erected by the installation of artificial lighting in about 100 cases.

Special Coin Boxes.—We hope at an early future date to install at our City Call Offices a special type of coin box which will collect shillings, sixpences, and pennies so that long-distance as well as local service facilities may be available. There is the further improvement both from a public and a Post Office point of view, that when these new coin boxes are fitted it will not be possible to call the exchange operator until two pennies have been placed in the box. If the call is ineffective the coins will be returned to the caller. I need hardly enlarge on the trouble that will be saved by reason of these boxes preventing small boys taking the receivers off and leaving them so, thus putting the call offices out of commission for the time being. This interference by small children and sometimes irresponsible adults is one of the greatest handicaps to this type of service, and I can assure you it would be of great and mutual assistance if members of the public would co-operate with us to prevent this abuse.

Traffic Branch.—The Traffic Branch is, however, the one with which you will be most directly concerned, as this is the section responsible for the service rendered at our exchanges. The attention a subscriber gets from the operator and the way in which calls are effected make other considerations appear of minor importance, for, if the calls are not handled with courtesy, efficiency, and celerity, what else matters?

Indifferent Operating at Subscribers' Offices.—I hope also that you will forgive my saying that one of the things that occasions great surprise to us is the indifference of so many of our subscribers to the part they play in the building up of an ideal telephone service. The time has long since arrived when a telephone call should take its place as a prime factor in the running of our business, yet there is an extraordinary difference in the manner of treatment meted out to a call and to a caller. It is a matter for wonder and some misgiving that the position of the telephone in many of our offices has not yet been given the status of a typewriter. It would be a good thing in this respect from your point of view, and it would certainly be most helpful to us, if you had only the best employee attending to your incoming telephone calls. I do not want to give you an impression that all the putting in order

* Extract from paper given to the Publicity Club, Glasgow.

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is to be on your side. It is not. What I do ask is a better realisation by the business community generally as to the part they can and should play in the attainment of the ideal we are out to achieve. It is not my desire either to suggest that we do not receive co-operation and help from our subscribers. In the main this is forthcoming, but there are many to whom I would earnestly appeal for more assistance, as our troubles are due to lack of thought on their part and to the non-observance of simple regulations. There is not a member of the telephone staff but who would do anything in reason to afford every facility to you in the conduct of your telephone business. Is it unreasonable to ask for similar consideration on your part?

Need for Publicity.—There is paramount need for publicity from an inside point of view so far as our Telephone Service is concerned. Most of us are familiar with the popular conception which is as far removed from reality as are the poles asunder. I am sure this erroneous impression is largely due to the unfortunate fact that the natural tendency amongst humans is to think by proxy. The man who will not trouble to think for himself relies on scraps of information which he may read or hear from time to time. If these are humorous, cynical, or otherwise funny, all the better, but it is the case that, unfortunately, in the final arbitrament, many folk build their opinions on foundations laid by others. Hence the allegations about the "Telephone evil" and the jokes about the "Service." It is full time someone told a few stories from the other point of view.

Need for Mutual Education.—While we feel, therefore, that the public need educating as to the factors and organisation behind the Telephone Service, we are not losing sight of the fact that "charity begins at home" in this, as in every other case. We are ourselves taking lessons every day. We are open to take them; we welcome new thoughts, fresh angles of vision, stimulating criticism, and the hundred and one other things that go to assist in the study and performance of our work.

Staff Meetings.—You will be interested to know that we have in Glasgow carried out an elaborate and intensive scheme of staff education recently, on matters pertaining to the service, especially from the public point of view. Every available exchange officer in this district has attended one or more official meetings at which the principles of service efficiency and organisation have been expounded and the effect of good or bad operating explained by means of charts, which on a smaller scale were similar to those before you. The service from the subscriber's point of view was explained in detail, and the conditions that obtain at the subscriber's end of the wires discussed and illustrated in every practical way. In all, about 900 officers attended the meetings, of which over 50 were held, and I venture to suggest that at this moment there is no member of the Post Office Exchange staffs in this district but who is conscious of the part she is playing in the rendering of a satisfactory service to the business community of this great centre, and who is at heart anxious to "do her bit" in the matter. Those of us who had the pleasure of conducting these meetings have not the slightest doubt as to their usefulness, and that they were appreciated by the staff is illustrated by the fact that we had nearly 500 questions put to us (on matters pertaining to the service, the administration, and the organisation). These questions have either been answered or are being considered, but the desire for information, the intelligent questioning of the staff, and the enthusiasm with which the various points were followed speak for themselves. It is the desire of the Department to interest its staff in their duties, to explain difficulties, to look at things from their angles of vision quite as much as it is our policy to look at the service from your point of view. This is being done so that we may get matters into focus and pursue only that which will make for mutual betterment and service progress.

Cost of Ineffective Work.—May I illustrate the point by one example? At all times we emphasize upon our staffs, and ourselves, the serious cumulative effect of what may appear trivial defects, when taken individually. At the present moment, we are effecting, at the first attempt, 86 out of every 100 calls we receive from our subscribers. We are trying to increase this to 90 out of every hundred. In itself this figure means very little to the individual subscriber or operator, but if we applied the improved percentage to the total Glasgow Telephone traffic we should not only improve the service to you but we should eliminate no less than 2 million waste transactions every year and save in our exchange costs alone a sum of money approximating to £4,000 per annum. Why, if we could only cut out 1% of our ineffective traffic, we should gain directly and the public—that is yourselves—indirectly, at the rate of something like £1,000 a year; and this, mark you, in respect only of the telephone traffic in Glasgow and district.

"Number Engaged" Waste.—It may be apropos at this point if I pointed out what the "Number engaged" bogy really means to us. Lots of folk are under the impression that our operators wilfully and wrongly report "Engaged" to callers. There was never a greater fallacy. It is easier for the average call to be effected right-away than it is for it to be delayed in any way. No operator gains anything by delay; on the contrary, there is always a possibility of trouble on that type of call. What exactly does this "engaged" trouble mean, therefore, in "terms of efficiency and cost"? At present 10% of our operating effort is waste labour because the required number is busy. Of what this means to you business men you are the best judges, but look at it from a Post Office point of view for a moment. We are now getting from our Glasgow subscribers about 57 million calls per annum. Nearly 6 million of these are lost (or ineffective) owing to the number required not being available when wanted. The operation of these calls from our point of view alone is thus waste of time and money, but it has to be paid for all the same and to the tune of about £11,000 per annum in operating costs alone! Need I emphasize this? May I suggest that when we are accused of deliberately misrepresenting that numbers are engaged, we consider the smile to be with us? Would you not feel amused if similar suggestions were made to you regarding the conduct of your business? If we can eliminate waste in any public service is it not the public who will ultimately benefit, and when I put it to you that, in so far as the "Busy" number is concerned, the remedy is largely with you, I feel that the figure regarding the waste it means will carry its own lesson to those who are prepared to learn.

Extensions of Trunk Calls.—There is another aspect of wastage which I am sure is not clearly appreciated by the general telephone user. I refer now to the use of our long-distance circuits. Most of you are familiar with—and are perhaps irritated by—the operator's "Time's up, will you take another call?" intimation, and I have no doubt that, in all good faith, you have often suggested to the operator that you have not spoken for three minutes, and that the Post Office could well allow you a few extra seconds. Shall we assume for a few minutes that the operators allowed these extra seconds as a matter of course on the Glasgow—London service, and further assume that this meant an average extension of thirty seconds only on each Glasgow—London call. There are about 200 of these calls each day or about 60,000 per annum. The approximate charge per 30 seconds amounts to 1*s.* 1*d.*, so that the loss of that amount of time on each London call alone would cost the Post Office £3,250 per annum. Need I say anything further as to the necessity for insistence on time limits even if pressed to the point of seeming curtness, and further to emphasize the fact that all these calls are timed from the moment the called and calling subscribers are on the line, whether or not the "persons required" are talking. This latter aspect is a point that is often overlooked by trunk users. I will not weary you with figures as to the wastage of revenue if we lost 30 seconds on every long-distance call originating at Glasgow, as I feel that the foregoing illustration will suffice for that particular point.

Additional Causes of Waste (Ineffectiveness).—Before we leave the "Wastage" side, however, will you permit me to submit one or two additional points regarding the effect of this on our service and operating costs? We have already seen that "Engaged" troubles lose us about 6 million calls a year and cost us about £11,000 for manipulation and supervision. Other unsatisfactory features are:—

	Per Annum.	
	Number.	*Cost.*
No replies	1,000,000	£2,200
Cut-off's	250,000	550
Wrong numbers connected ...	500,000	1,100
Junctions engaged and sundries	250,000	550

The total loss to the Post Office, therefore, in Exchange charges only and by reason of ineffective or delayed telephone calls, is estimated in the Glasgow District alone to exceed £15,000 per annum.

Personal Figures.—I should perhaps say that all the figures given up to now, and those which follow later, as to costs, waste, and so on, are based on a recent and unofficial investigation as to our service and its organisation. They are not for general application, neither can they be quoted in any way as representing the official word on such an important subject. They are given, however, for what they are worth and in the hope that they will, at least, afford an interesting and perhaps instructive item of information to all present.

Operating Costs.—Every time one of our telephonists answers a calling number there is a certain operating cost to the Post Office. So far as our local studies on this matter have taken us, up to the present, this cost averages about one halfpenny, which has to be paid whether the call is effective or not. This figure refers only to the Exchange Staffs and takes no account of Capital, Equipment, Engineering, Maintenance and Overhead charges. I am sure it will be obvious that, for our own sake, we must strive and keep on striving, to reduce and if possible eliminate, the ineffective call. We are doing this and will continue to do it so long as we can do anything at all. There is already evidence that our efforts are bearing fruit. We have been making local enquiry, for instance, as to the revenue value of each originating call. I cannot give you figures previous to 1925, but for that year we calculated the average money value of each call to be 1.49 of a penny. For 1926 this figure had risen to 1.53 of a penny. Just an increase of .04 of a penny on each call or 1*d.* on every 25. Not much, truly, if taken by itself, but vital when applied to the 57 million calls of last year. What does this improvement mean? It can be expressed in varying ways. One, for example, is that we earned ¾*d.* more for every 1,000 calls we operated in 1926 as compared with 1925. We handle about 200,000 originating calls every normal weekday in Glasgow. It does not call for a mathematical genius to calculate that, for equivalent traffic, we now earn about £33 more per day than in 1925 just because our efforts towards improvement have resulted in a saving of one pennyworth of waste labour on every 25 calls. Don't you think it is worth worrying over trifles so far as we are concerned? I hope I have made this clear. We are not actually earning more money on each call (except in so far as the proportion of our "Long Distance" traffic has slightly increased), neither are the subscribers paying any more, but by the elimination of waste and the natural result of a greater percentage of effective work the revenue value to us of each call has improved, and it is you who will reap the ultimate benefit of this.

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Written Complaints.—The figures I have given hardly need confirmation from an independent quarter relating to the number of written complaints. In 1925 we received one letter for each 28,688 calls; in 1926 the ratio was 1 to 41,661. Even if subscribers do not complain every time they feel they should, the comparison is gratifying and is as much a credit to our subscribers as to ourselves.

Lost Calls in Terms of Population.—We have already said that in the Glasgow District during 1926 approximately 57 million calls were originated by our subscribers. This works out at a little over a million a week or, as near as doesn't matter, one call per week for each man, woman, and child of this city. As, however, 14 of every hundred of those calls are ineffective, it means that an area approximately equal in size and density to Partick does not get an efficient service; that is to say, in this city at the present time the waste work going on in our telephone exchanges is in the same relation to our total work as the whole of Partick is to Glasgow.

Busy-Hour Telephone Loads.—During the Busy Hour of a normal weekday in Glasgow we estimate that at least 500 calls* a minute are originated by our subscribers. Suppose we were out of action for ten minutes! What do you think would happen? We have a fairly shrewd idea, for we know what commotion results when we have fire drill practice. The girls are then away from the switchboard for about 45 seconds, and when they come back ——; as one subscriber facetiously remarked, he thought we had been observing a ten minutes' silence! No doubt it seemed like that to him, but it makes us very critical of sweeping statements as to the number of *minutes* it takes to call an exchange. As a general rule we measure our "day" from 8 a.m. to 8 p.m. Our "peak" hour happens, as a rule, between 9.30 and 11.30 a.m.; it varies at the different exchanges, of course, but all our staffing arrangements and circuits are based on maximum requirements. When I say that, broadly, the public rush one-sixth of their total telephone work into one hour, you will, I am sure, realise that unless we are extremely careful we shall have considerable waste of force and plant at other periods of the day. The study of traffic and the staffing of telephone exchanges to meet the ebb and flow of calls might well form the text of a separate address. I can assure you it has a fascination of its own if only for its ever changing nature and the newness of the problems which keep cropping up. A competent duty and load officer has a great deal to do with the quality of the service.

Duration of Calls.—The average duration of a call to a subscriber on the same exchange as the caller is 2½ minutes; of a junction call, that is a call to another Glasgow exchange, 3 minutes, and of a trunk, or long-distance call, 4½ minutes. It may be superfluous to talk of a lost second or so, but it is these elusive pimpernels that we are constantly chasing, and if we can discover just where they all go we shall have made a great step forward. Time is literally money to us. Would you credit, for example, that a loss of one second only in operating time on each call means a waste in Glasgow alone of a sum approximating to £1,300 per annum?

Improving Trade.—You will be glad to know that the telephone glass is rising, and as I consider this barometer fairly reflects trade conditions, the outlook in that respect is improving, and has been for some time. Last year, for example, our Glasgow traffic increased by no less than 2¼ million calls and our telephone stations by 2,849. This latter figure represents the greatest advance for many years past, and we are hoping that this year of grace will see even that beaten. The present signs are most favourable, particularly in so far as calls are concerned. It is a great joy to feel that, despite the Jeremiahs, we are accelerating our onward march; there is plenty of room and ample reserve equipments and plant in this district to double our present rate of growth, and no one will be more pleased with progress than the members of the telephone staff to whom you talk every day.

Use of Long-Distance Services Outside the Busy Hours.—Will you permit me again to direct attention to our very fine long-distance services and to urge greater use of these circuits during the afternoon hours. The charges, as you know, are reduced from 2 p.m. onward, and if this can be arranged between your clients and yourselves, prolonged use of certain of our Trunk circuits would be granted. I shall be glad to quote terms to anyone caring to make enquiry. Then again, there is a very fine service now available to the Continent. I am sure the facilities available in this regard are either insufficiently known or are not yet properly appreciated. The Transatlantic service, about which much has been said recently, is a wonderful achievement which has not yet been appraised at its real worth to the British and American business community. The American, at any rate, seems to be getting the idea now for he is putting more calls through to us than we are to him.

Conclusion.—I could say much more, but time will not permit; perhaps, however, you will allow me to say again that, despite cartoons to the contrary, we still put a smile into our work and we try to get it into our voices too. It is difficult sometimes, but the effort is made. You will be glad to know also that our exchange staff speak very highly of their treatment by the Glasgow public. There are exceptions, but these only prove the rule, and they stand out the more prominently because of the courtesy and helpfulness of the average caller. I hope we too shall always convey to you by word and deed that we have a personal, as well as an official, interest in the attainment of a telephone service as nearly perfect as it is possible to make it.

* This means that 1,000 folk are making use of the service (500 callers; 500 called).

THE WASHINGTON CONFERENCE.

THE Radiotelegraph Conference at Washington was opened by President Coolidge on Oct. 4. The Secretary for Commerce, Mr. Hoover, was appointed President of the Conference and delivered an eloquent oration on the development of wireless and the need for its wise regulation and control.

The British delegation to the Conference is composed as follows:—

Colonel T. F. Purves—*Post Office* (Head of the Delegation).
Air-Commodore L. F. Blandy, C.B., D.S.O.—*Air Ministry.*
Mr. C. H. Boyd—*Board of Trade.*
Capt. A. L. Harris, M.C.—*War Office.*
Major F. W. Home, R.M.—*Wireless Telegraphy Board.*
Mr. J. Louden—*Post Office.*
Commander F. Loring, R.N.—*Post Office.*
Commander E. W. Money, O.B.E., R.N.—*Admiralty.*
Mr. F. W. Phillips—*Post Office.*
Mr. E. H. Shaughnessy, O.B.E.—*Post Office.*
Lt.-Commander E. W. H. Travis, R.N.—*Foreign Office.*
Mr. A. J. Waldegrave, M.B.E.—*Post Office.*

The following additional British representatives are present in an advisory capacity and not as delegates:—

Lieut.-Col. E. Gold, D.S.O., F.R.S. (International Commission for Synoptic Weather Information)—*Air Ministry.*

Capt. P. P. Eckersley (International Radiotelephony Union)—*British Broadcasting Corporation.*

Senator G. Marconi, G.C.V.O., LL.D., D.Sc.
Rt.-Hon. F. G. Kellaway, P.C.
Mr. C. E. Rickard, O.B.E.
Mr. F. S. Hayburn
Commander J. A. Slee, C.B.E., R.N.
} *Wireless Companies.*

Mr. A. W. Hibberdine
Mr. W. Dover
Mr. P. Eschbaecher
} *Cable Companies.*

Captain W. A. Soutar
Mr. M. Brett, B.C.L., M.A.
Mr. D. A. Cleminson
} *Shipping Interests.*

Mr. T. J. O'Donnell—*International Federation of Radiotelegraphists.*

The British delegates made their way to Washington via Canada. Following the good example of the Prince of Wales and Mr. Baldwin they travelled by the "Empress of Australia," a very comfortable and well-appointed ship. After spending a few days at Ottawa they found, strangely enough, that the most convenient way to reach Washington was by way of Niagara, and naturally they could not go through Niagara without seeing the Falls.

The Washington Conference has already done one remarkable thing. French has hitherto been the only language permitted at Postal, Telegraph and Radiotelegraph Conferences. The United States delegation, however, represented that insistence on this rule would render most of their representatives practically dumb. Alarmed at such a prospect, and as an act of courtesy to their hosts, the Conference decided that English should be permitted. Speeches in English are translated into French, and those in French are translated into English if any delegation so desires.

There are about 400 members of the Conference and about 1,800 formal propositions to be considered. The Conference at its second meeting appointed ten Committees, the second Committee, under the title "General Regulations," being placed under the Chairmanship of Colonel Purves.

Possibly as a delicate hint to their guests, the United States authorities have announced that the farewell banquet will be held on Nov. 15. With its unwieldy size and its large programme the Conference will find it difficult to live up to this expectation. But delegates may be relied upon to do their best. It must be remembered that the United States is a dry country.

F. W. P.

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CORRESPONDENCE.

BAUDOT-VERDAN.

TO THE EDITOR OF "THE TELEGRAPH AND TELEPHONE JOURNAL."

Sir,—Mr. Harrison's description of the functioning of the "Baudot-Verdan" is quite correct. Six signals are stored during each revolution of the discs and automatically repeated seriatim after an interval of two seconds.

For elucidation I have added a chart of the transmissions, &c., during three revolutions of the discs.

I should like to add that the working of the apparatus between Paris and Algiers has shown a speed generally of 90 words a minute. During the greater part of the time one repetition only has been necessary. From 20,000 to 25,000 words have been dealt with during each daily session. So well, in fact, has the apparatus functioned that it is being installed for working between Paris and Morocco, Tunis, and some European countries.

Enquiries have been made as to the effect of atmospherics of a "spacing" character. M. Verdan says that no trouble has been experienced from this cause during the working of this apparatus.

M. Verdan may certainly be complimented on his contribution to the advance of the use of printing instruments in Wireless Telegraphy.

E. PHILLIPS.

CHART.

DETAILED EXAMPLE OF TRIPLE TRANSMISSION BY THE "BAUDOT-VERDAN."

Assume that "Manchester Eng." is to be sent.

Distributor brushes:	1st revolution	... ...	**M**	sent to line from key via segs. 11/15, and stored in repeater 1.
	2nd „	... ...	**A**	„ „ „ „ „ „ „ „ „ „
	3rd „	... ...	**N**	„ „ „ „ „ „ „ „ „ „
	4th „	... ...	**C**	„ „ „ „ „ „ „ „ „ „
	5th „	... ...	**H**	„ „ „ „ „ „ „ „ „ „
	6th „	... ...	**E**	„ „ „ „ „ „ „ „ „ „
		(The discs have now completed a revolution.)		
	7th „	... ...	*M*	sent to line from repeater 1 via segs. 6/10, and stored in repeater 2.
			S	„ „ key „ „ 11/15, „ „ „ 1.
	8th „	... ...	*A*	„ „ repeater 1 „ „ 6/10, „ „ „ 2.
			T	„ „ key „ „ 11/15, „ „ „ 1.
	9th „	... ...	*N*	„ „ repeater 1 „ „ 6/10, „ „ „ 2.
			E	„ „ key „ „ 11/15, „ „ „ 1.
	10th „	... ...	*C*	„ „ repeater 1 „ „ 6/10, „ „ „ 2.
			R	„ „ key „ „ 11/15, „ „ „ 1.
	11th „	... ...	*H*	„ „ repeater 1 „ „ 6/10, „ „ „ 2.
			Blank	„ „ key „ „ 11/15, „ „ „ 1.
	12th „	... ...	*E*	„ „ repeater 1 „ „ 6/10, „ „ „ 2.
			E	„ „ key „ „ 11/15, „ „ „ 1.
		(The discs have now completed another revolution.)		
	13th revolution	... ...	**M**	sent to line from repeater 2 via segs. 1/5, and local control actuated.
			S	„ „ „ 1 „ „ 6/10, and stored in repeater 2.
			N	„ „ key „ „ 11/15, „ „ „ 1.
	14th „	... ...	*A*	„ „ repeater 2 „ „ 1/5, and local control actuated.
			T	„ „ „ 1 „ „ 6/10, and stored in repeater 2.
			G	„ „ key „ „ 11/15, „ „ „ 1.
	15th „	... ...	*N*	„ „ repeater 2 „ „ 1/5, and local control actuated.
			E	„ „ „ 1 „ „ 6/10, and stored in repeater 2.
			Blank	„ „ key „ „ 11/15, „ „ „ 1.
	16th „	... ...	*C*	„ „ repeater 2 „ „ 1/5, and local control actuated.
			R	„ „ „ 1 „ „ 6/10, and stored in repeater 2.
			Blank	„ „ key „ „ 11/15, „ „ „ 1.
	And so on.			

In reception the sequence of movements is the same. The first transmissions are received via segs. 11/15, and stored in the first repeater: the first repetitions are received via segs. 6/10 and are stored in the second repeater, false signals being corrected, the second repetitions are received via segs. 1/5 and actuate the electro-magnets of the printing apparatus.

"CODOC" AND "MERRIE ENGLAND" AT THE KINGS HALL.

THE Central Telegraph Office Operatic, Dramatic and Orchestral Club was laudably ambitious, firstly in arranging for so difficult an effort as Hood and German's far from facile work, and secondly, in boldly venturing two nights in a larger hall than any available in the City of London itself. Courage and hard work were rewarded by a full house on each occasion and enthusiastic audiences.

"Don't go the first night," said someone, "they are sure to be a little ragged," but although the writer did not accept the advice offered and became a First-nighter, there was nothing in the performance to indicate that the entire company had not been playing together for a week and more.

Florence Pennichard made a stately Queen Elizabeth, and Marjorie Bryan a convincing Jill-All-Alone, while The May Queen's part well became Miss Lenthall as did that of Bessie Thockmorton by Adeline Paterson. The Earl of Essex, as one would have anticipated, well-fitted Sydney Moore, while Frank Barker's courtly mien and not less courtly voice ably presented that side of Raleigh's personality which one generally associates with the cloak incident and which the authors of the work no doubt wished to emphasize. Bertie Figg, well, Bertie excelled himself in the part of Walter Wilkins; versatile and tireless from start to finish.

The choruses were well kept together and came solidly over the foot-lights, while the "crowd" work more approached the naturalness of a real crowd than some I have seen (and *heard*) from more distinguished companies.

Mr. Gwynn is to be congratulated as Musical Director for the excellent results produced by the orchestra.

In one word, as an "outsider" put it, "There was really scarcely an amateurish touch throughout the whole performance," and there I cannot do better than leave matters. J. J. T.

FIFTY YEARS WITH TELEPHONE PIONEERS.

SUCH was the interesting title of an interesting paper read before the P.O. Telephone and Telegraph Society by Mr. T. A. Prout, at their inaugural gathering held at the usual rendezvous on the Victoria Embankment on the 17th ult.

Mr. Prout, who has only retired from active service in the Secretary's Office, G.P.O., but a few months, had evidently spared considerable time from his hobbies of golf and gardening in the preparation of a paper which was crammed with interesting matter and could well have occupied two evenings instead of one. The task of crowding the telephone history of half a century into one hour was a task that only a brave man could have attempted.

A hearty round of applause greeted the reader of the paper as he resumed his seat, and the criticism—if such it could be called—then followed, being opened by Mr. Powell-Jones of the Telephone Development Association, whose remarks furnished just that outside point of view so much needed in meetings of this description.

The meeting augured well for a successful session under the genial chairmanship of Mr. L. Simon. The next gathering will take place on Monday, 21st of the present month, when Sir Henry N. Bunbury, K.C.B., Comptroller and Accountant-General, G.P.O., will deal with "Telegraph and Telephone Finance." J. J. T.

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Where Strowger Autom

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THE telephone business is a constantly growing, constantly developing business. Every day new and better materials are being developed which must be adapted to existing equipment. Every day brings new service and traffic conditions for which new circuits and new combinations of apparatus must be designed.

To keep Strowger Automatic telephone equipment abreast of the times—ready to meet not only the needs of to-day, but also those of to-morrow—demands a keen appreciation of modern methods tempered with the conservative wisdom that comes from long experience.

The Research and Development Departments of Automatic Electric Inc. are composed of men who, for the most part, have devoted their lives to the development of Strowger equipment, to the end that it may meet the needs of to-day and to-morrow better and more economically.

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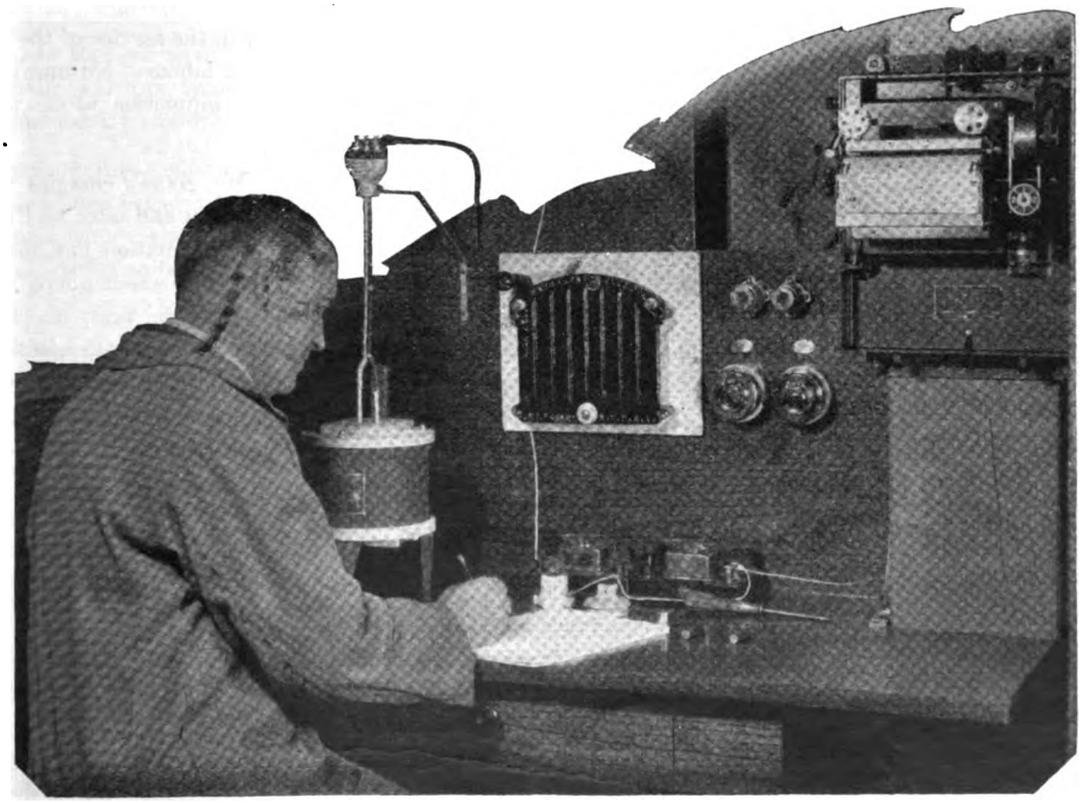
ic Leadership Begins ~

c's Proving Ground

The testing and selection of the hundreds of different kinds of materials that enter into the construction of Strowger Automatic telephone equipment is a never-ending job, requiring the use of the latest testing facilities known to science. Below is shown a transformation point recorder for the testing of iron for use in electro-magnetic devices.



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The
Telegraph and Telephone Journal.

PUBLISHED MONTHLY IN THE INTERESTS OF THE TELEGRAPH AND TELEPHONE SERVICE, UNDER THE PATRONAGE OF THE POSTMASTER-GENERAL.

Editing and Organising Committee - - - J. STUART JONES. W. D. SHARP. J. F. STIRLING. W. A. VALENTINE. J. W. WISSENDEN.

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NOTICES.

As the object of the JOURNAL *is the interchange of information on all subjects affecting the Telegraph and Telephone Service, the Managing Editor will be glad to consider contributions, and all communications together with photographs, diagrams, or other illustrations, should be addressed to him at the G.P.O. North, London, E.C.*1. *The Managing Editor will not be responsible for any manuscripts which he finds himself unable to use, but he will take the utmost care to return such manuscripts as promptly as possible. Photographs illustrating accepted articles will be returned if desired.*

VOL. XIV. NOVEMBER, 1927. No. 152.

RETIREMENT OF MR. JOHN SCOTT.

THE retirement at the end of last month of Mr. John Scott, who has been Postmaster-Surveyor at Birmingham since July 1, 1919, requires more than a passing mention, for it removes from official circles a man of outstanding personality who has carved for himself a special place in the life of the Post Office and of the Civil Service generally.

Mr. Scott entered the service of the National Telephone Company in 1895 and, within the remarkably short period of ten years, had become District Manager of one of the largest districts, that of Manchester. At the time of the transfer of the National Telephone Company's business to the Post Office, on Jan. 1, 1912, he had been for four years Assistant Provincial Superintendent at Birmingham, and he became, in the Post Office organisation, one of three provincial Superintendents, Mr. Dalzell and Mr. Valentine being his colleagues. In 1915 he was appointed Postmaster-Surveyor of Sheffield, and in 1919, as already stated, he was transferred to the corresponding but higher position at Birmingham. It may, perhaps, be added that, in 1911, when still in the Company's service, Mr. Scott was loaned for some time to the Turkish Telephone Company to take charge of the development study of Constantinople for its first telephone system. So much for the historical facts of Mr. Scott's career.

Mr. Scott belongs essentially to the category of men whose natural sphere is the world of business, where ready and sure judgment, energy, and the power to give immediate effect to a decision command success, and where new fields are always open to the man of high courage. Comparisons between the "business" man and the Civil Servant have been numerous, and generally futile because they start on wrong premises. The man in business for himself can improvise as he goes along and what he decides to-day he can cancel to-morrow. A Government Department obviously cannot carry on the business of the State in that manner, and must of necessity seek a large measure of uniformity and permanence in its procedure and regulations. That Mr. Scott entered the Civil Service by accident and in middle life explains his retention of some characteristics not generally associated with Civil Servants; such differences have probably been useful both to Mr. Scott and the Service. It may be of significance that Mr. Scott is leaving the Service at the earliest date which would not involve the sacrifice of the award for past years of labour, in order that he may seek a field of usefulness and reward outside; if so, it probably means only the obvious truism that at 60 a man has a better chance of success than he would have at 62 or 65.

The fact that Mr. Scott is not a typical Civil Servant is probably, though parodoxically, the secret of his success as a Civil Servant. In his refusal to conform to Civil Service type, in his unconventionality, in his occasional brusqueness and outspoken intolerance of views which appeared to him to be unsound, he has been like a vigorous and bracing Northern wind in sheltered quarters, but these qualities alone would not have steered him to the high position which he won in the Post Office service. The conditions of Post Office work almost certainly irked him, but they never discouraged him, and he used his great abilities and spent his remarkable energies as lavishly and as unselfishly in the service of the State as he would have done in other spheres of labour. No man has fulfilled more conscientiously the apostolic injunction to do the work at hand with all one's might.

As might be expected, Mr. Scott's energies were not confined to his official duties. At Sheffield and later at Birmingham he has taken so active a part in the formation and development of the National Savings movement that he was honoured with appointment to the Order of the British Empire, first, in 1917, as a Member and last year as an Officer. He is an enthusiastic Rotarian and is a past-president of the Birmingham Rotary Club. He was the first president of the West Midlands group of the Institute of Public Administration, and is a trustee of Mansfield College, Oxford. He has played an active part in the civic and social life of Sheffield and of Birmingham, and his retirement has led to a remarkable expression of regret from the Lord Mayor of Birmingham and to a public demonstration of it in a tangible form.

To all his activities, official and extra official, Mr. Scott brings common sense and a strong vein of humour. To those who know him best his loyalty and friendliness are outstanding traits. He has a good deal of the spirit of Peter Pan and brings an air of breeziness and bonhomie into any company of men. His ability to tell a good story, especially if it be one against his own countrymen beyond the Tweed, is well known and appreciated. A big lovable Scotsman and a man of varied interests passes from the ranks of Post Office men and women. He must in the nature of things feel some regret on leaving the Service but his regret can hardly equal that of his friends whom he leaves

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THE SINS OF BUREAUCRACY.

GOETHE says somewhere "There is nothing frightfuller than energetic ignorance."* It is surprising how many of the attacks on "bureaucracy" fall under this head and what little knowledge is held to qualify those who busy themselves on this subject to air their views in the Press. We like to keep a wary eye on these casual and inconsequent criticisms. They are not usually important or instructive, but it is well now and again to challenge the hollowness of their statements. A characteristic example in a daily paper recently read as follows :—

"An Englishman who has returned to New York after a holiday in England has stated publicly that the telephone service in England is the worst in Europe."

We may remark in passing there is no penalty for "stating publicly" an expression of opinion however inaccurate and misinformed, unless it is in the nature of a libel, and that it is therefore no more difficult and no truthfuller to "state publicly" that telephone or railway or other public service is bad than to whisper it darkly in corners, or to write it in sand or on water. The statement in question is simply unproven and untrue.

"Telephones are bureaucratically managed in England," continues the writer, "and are only a luxury for people of more than average means."

We can only say that we have often wished that our gas and electric lighting bills were as moderate as those we pay for a bureaucratically managed telephone service. He continues :

"Large country houses, containing priceless art collections, are allowed to burn down because there is no telephone connexion to call the fire brigade, while people who reside in the country districts have to send for the doctor on foot or on horseback, as in the middle ages."

But our critic forgets that country people are mediæval in other respects besides that of possessing no telephone. They sweep their carpets, wash their clothes, curl their hair, and toast their bread as they did in the middle ages, but he does not blame bureaucracy for that. In a recent inquisition into the home life of 11,232 typical American houses, it was found that 70% had telephones, 60% vacuum cleaners, 29% electric washers, 28% electric curling irons, and 20% electric toasters. It will not be claimed, we think, that a like proportion of those household luxuries (or necessities) will be found in this country. Then again, it is well known that the ratio of motor vehicles to population is even higher than that of telephones in America, and consequently nearly five times as high as in this country. Surely this ought to mean that the motor industry in this country must, by inference, be bureaucratically managed. And yet, though we seem to remember seeing columns and columns of laudatory accounts of the progress of that industry in the Press, it is no more highly developed per head of population than the telephone.

Finally, the "Englishman" remarks that in America the telephone is controlled (as we know) by private companies "with the result that competition ensures a satisfactory service." There are, it is true, numerous companies in America, but there is practically no competition. Competition usually means that one has to pay subscriptions to two telephone companies instead of one, and is therefore repugnant to the good sense of Americans. A comparatively small company co-exists with the "Bell" company in Philadelphia, but we can call to mind no other important place in America in which there is competition. Other causes must be sought for the excellent service given in the United States.

**Es ist nichts schrecklicher als eine thätige Unwissenheit.*

HIC ET UBIQUE.

WE gave some figures in our August issue of the number of telephones at Dec. 31 last in the principal telephone-owning countries of the world. We can now add the figure for Canada which is 1,204,691, or 7.8 inhabitants per telephone. Quebec had 246,138 telephones, Ontario 535,046, Saskatchewan 102,148, and British Columbia 101,915.

The Soviet system in Russia had 241,378 telephones at the same date, of which 49,887 were in Moscow and 38,860 in Leningrad. This gives a ratio of 1 telephone to about 570 inhabitants in the Union of Soviet Republics.

According to the *Lokalanzeiger*, Berlin, wireless telephone trials will shortly be carried out between Berlin and Tokio.—*Central News.*

Reuter's Trade Service reports the following from Stockholm : Economic relations between Sweden and Turkey are being steadily developed, the latest step being the conclusion of an agreement between the Swedish L.M. Ericsson telephone company and the Turkish Government for the construction of a telephone system in Turkey. A Turkish company will be founded with a share capital of 6,000,000 Swiss francs, half of the shares being subscribed for by the L.M. Ericsson Co. and the other half by the Turkish Government ; the capital will later be increased. The company will obtain a 40-year concession for the construction of lines between the most important Turkish towns, Angora-Constantinople, Smyrna-Constantinople, Smyrna-Angora, &c., and local telephone systems in some towns, not including Constantinople, where the concession is held by an Anglo-French combine. Agreements for the construction by the L.M. Ericsson Co. of local systems at Smyrna and Angora have previously been concluded. The material for the work will be supplied by the L.M. Ericsson Co., which will also provide engineers. The agreement is subject to ratification by the Turkish National Assembly, which meets in October.

The British Commercial Secretary at Athens states that the Greek telephone service is still very deficient and the number of sets at present authorised is quite insufficient for the requirements. A concession for the reorganisation of the telephone service was obtained by a Belgian company, which was to have co-operated with a British company for the supply of the material, but the British company subsequently withdrew its support. The Belgian concern has since conceded its rights to a Greek group, which, it is said, is still trying to raise the necessary capital. This concession, which was granted under the Pangalos Government, figures in the list of concessions which are to be examined by the present Government.

As from Oct. 1 last some 20,000 of the telephones in use in the Brussels area have been turned over to automatic working.

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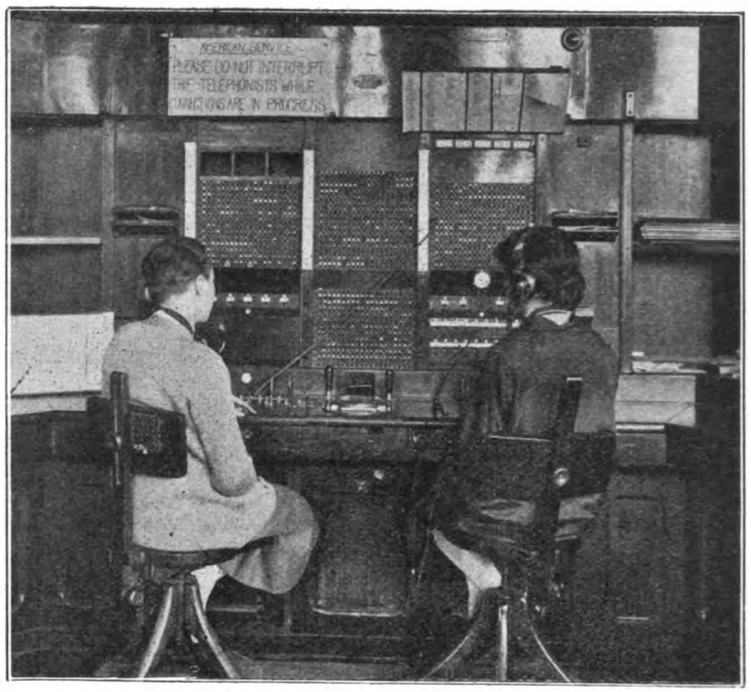
ANGLO-CANADIAN TELEPHONE SERVICE.

ON Oct. 3, 1927, commercial telephone service was opened between London and the five chief cities of the Canadian province of Ontario—Ottawa, Toronto, Montreal, Quebec, and Hamilton.

Communication is obtained by means of the existing trans-atlantic radio-telephone link—the only one at present capable of transmitting commercial telephone speech—using the Rugby and Rocky Point high-power transmitting stations in England and in Maine, U.S.A., respectively ; and the receiving stations at Houlton, Maine, and Cupar, Fifeshire ; calls from London to Canada pass over the London-New York circuit and are switched through at New York to their destination over the land lines of the American Telephone & Telegraph Company and the Bell Telephone Company of Canada.

The importance of the occasion as the beginning of a new era in Imperial communications was marked by the inauguration of the service with a conversation between the Prime Minister, speaking from Downing Street, and Mr. MacKenzie King, Prime Minister of Canada, in Ottawa. Mr. Baldwin referred to his recent visit to Canada ; and both he and Mr. MacKenzie King expressed their confidence in the utility of the developments in which the new service was the first step. The Canadian Minister of Justice then spoke from Ottawa to the Director of Telegraphs and Telephones in the General Post Office, London ; and Mr. Thomas Ahearn, Director of the Bell Telephone Company of Canada, had a conversation with the Controller of the London Telephone Service. Successful commercial calls with some of the other towns in Canada followed on the same afternoon.



The rates charged are the same as those for calls to corresponding places in the United States and the same facilities, e.g., the "search" for a particular person wanted, are provided in the two services. Extensions of the service to more distant Canadian towns will probably follow fairly soon and it is hoped that it will be possible to make the service also available from the provincial centres of Great Britain.

NOTE.

The upper block shows the telephonists operating the trans-atlantic positions at the London Trunk Exchange. Miss Jones (left) and Miss Hughes (right). The lower picture shows the telephonists operating the corresponding positions at the New York Trunk Exchange. Seated, from left to right: Misses Jean Ficaretta, Gertrude Rich, Florence Sullivan, Florence O'Loughlin. Standing: Misses Mary Parker and Helen Merry.

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TELEGRAPHIC MEMORABILIA.

AUSTRALIA.—The *Industrial Australian and Mining Standard* states that the Radio Research Board constituted by the Federal Council for Scientific and Industrial Research has mapped out its programme for the ensuing year. It will work in close co-operation with the corresponding body in Britain. Its members are Dr. J. P. Madsen (chairman), professor of electrical engineering at the University of Sydney; Mr. H. P. Brown, director of postal services; Dr. T. H. Laby, professor of physics in the University of Melbourne; and Commander Cresswell, of the Defence Department. Prof. Madsen left Australia in August on a private visit to England, and while in England he will inquire about the work of the British Board, and arrange for collaboration. When necessary the cost of apparatus will be borne by the Council of Scientific and Industrial Research, on which will rest the ultimate responsibility for the scheme.

Speaking in Sydney at the end of September, Mr. Bruce, the Prime Minister, stated that during the past two months only 2% of the messages handed in for transmission by the beam service have been transferred to the cable companies. The amount paid for the transmission of these messages was £3,293.

Reuter's Sydney Trade Service informs us that the plans for New South Wales State broadcasting service have been extended and will probably cost £30,000 instead of the original £23,000. In addition to the Sydney broadcasting station and half-a-dozen relay stations, there will probably be 30 subsidiary stations of low power.

Following complaints from listeners in Victorian country districts that the reception of the programmes broadcast during several days by 3LO (Melbourne) had been practically useless owing to interference from another station, inquiries revealed the fact that JOAK (Japan) was the cause, it having practically the same wavelength as 3LO. Cables were sent to Japan in an endeavour to remedy the trouble, and arrangements have been made for 3LO's wavelength to be reduced by several metres.

To the same agency we are also indebted for the information that the New South Wales Cabinet has approved of the establishment by the State of an "A"-grade broadcasting system. The proposal includes the erection of a central 15-kw. station, in or near Sydney, and six relay, or repeater, stations in the country. The total cost would be about £30,000. The stations will re-broadcast telephony, or Morse, and when not used for Government purposes could be used for re-broadcasting programmes. No land lines will be used for communication between the central station and the others.

It has also been communicated that Mr. E. G. Beard, consulting engineer to the Sydney broadcasting station (2GB), when recently giving evidence before the Wireless Commission, outlined a scheme for allocating Australian wavelengths which, he asserted, would make inter-State reception easy. He suggested that the wave-band of 150 to 550 metres should be divided into six equal parts, one part to be allotted to each State. Two waves, each 30 kilocycles from the centre of the band, should be allotted, one to each "A"-class station. Two waves, of 10 kilocycles from the centre of the band, should be allotted, one to each "A"-station, as relay link waves. The "B" stations should be allotted waves starting with those 20 kilocycles from the nearest "A" station, and 10 kilocycles apart, to the limits of the band.

Of every 30 persons in the Commonwealth, one is the holder of a wireless licence. During the 12 months ended June 30 the number of licences in the Commonwealth increased by 97,079, making the grand total 215,139. The number granted and cancelled in June and the number in force at the end of the month, according to figures made available by the Director of Postal Services (Mr. H. P. Brown), were as follows:—

State.	*New Issues.*	*Cancellations.*	*In force.*	*Per 100 of population.*
New South Wales	3,395	771	59,880	2.55
Victoria	7,106	2,177	118,965	6.95
Queensland ...	1,139	177	33,249	2.63
South Australia ...	930	200	16,791	2.96
Western Australia	123	93	3,903	1.03
Tasmania	112	1	2,351	1.14
Commonwealth totals	11,805	3,359	225,139	3.68

The London *Daily Telegraph*, referring to the above Commission, says that the report recommends that the control of broadcasting stations should remain in the hands of the Postmaster-General, subject to the administration of the Australian Wireless Committee, of which the Director of Postal Services is chairman. The report further recommends co-operation between broadcasting stations to effect interchange and improvement of programmes; further research to determine the relative merits of higher power stations and relay stations; and that in the meantime no further licences be issued for new stations. It also recommends that the location of existing stations be reviewed in consultation with the Defence Department; that the Commonwealth representative at the International Conference should advocate the limitation of the royalty chargeable for broadcasting copyright musical works; the reduction of the Amalgamated Wireless Company's charges and patent royalties; or, failing reduction, that the Commonwealth Government should acquire the company's privately-held shares. It finally recommends that all land coastal stations be re-acquired by the Postmaster-General.

AUSTRIA.—A number of the motor vehicles belonging to the fire brigade authorities of Vienna have lately been equipped with radio receiving and transmitting apparatus, to enable communication to be maintained between the scenes of fires and headquarters.

BELGIUM.—M. Jaspar, the Prime Minister, and M. Anseele, the Minister for Posts and Telegraphs, inaugurated on Oct. 3 the Ruysselede wireless station which has been designed specially for communication with America and the Congo.

The new station lies between Ghent and Bruges. It will use at will both long and short waves. The station covers an area of 358 acres. The aerials are slung between eight pylons each 930 ft. in height.

According to Reuter's Brussels agency the telephone test experiments, by the Belgian Director of Telegraphs and Telephones, on the 6th ult., with New York via London and the Rugby wireless-telephone station were perfectly successful.

BOLIVIA.—The Bolivian Government, says Reuter's La Paz representative, has arranged with a private contractor for the installation of a broadcasting station at La Paz, the first of its kind in Bolivia, with a power of 1,000 watts and a minimum radius of 3,000 km. (The international radio call letters assigned to Bolivia are CPA-CPZ.) The Government reserves the right to install radio-telephonic stations at any time. The La Paz station will be used for broadcasting Government reports, market quotations, official time, Congress proceedings, &c. Five minutes of each hour only may be employed for broadcasting advertising matter. The contract is for five years, and on its expiration the broadcasting station will become State property. The concessionaire, who undertakes to establish a weather bureau, send out meteorological reports and supply a daily service of general news, musical programmes and educational lectures, will retain all subscriptions. An initial registration fee of 5 bolivianos (7*s.* 6*d.*) and an annual licence fee of 46 bolivianos will be charged to users of the broadcasting service.

BRAZIL.—From Rio de Janeiro the information comes that the Brazilian Minister of Communications has approved a concession for an international and national wireless service. The sites of the various stations are left to the discretion of the Government's advisers. The Administration stipulates for a 75% reduction on foreign and 50% on national messages dispatched by the Departments of Public Works and Transportation, Marine and War. All operators are to be of Brazilian birth and the installation must be completed within a year of the official approval of plans. The Government has also authorised the Companhia Telefónica Rio Grandense to operate wireless stations at Sao Paulo, Florianopolis, Puerto Alegre, and Corumba. A station, independent of the new concession, has lately been opened at Manés (State of Amazonas).

The American International Telephone and Telegraph Corporation announces that it has acquired a controlling interest in the Companhia Telefónica Rio Grandense, which does business in the States of Sao Paulo, Parana and Rio Grande do Sul in Brazil, says *T. & T. Age*. The Corporation recently acquired control of the Montevideo Telephone Co. and the Co-operative Telefonica Nacional of Uruguay, which together operate more than 19,000 telephones, and the Chile Telephone Co., the third largest in South America, operating more than 25,000 telephones.

BULGARIA.—A new Act, reports the *Electrical Review*, has lately come into operation in Bulgaria under which wireless telegraphy, telephony and broadcasting are made a State monopoly. Receiving sets may only be used by licence-holders, infringers of the regulations being liable to twelve months' imprisonment, a heavy fine, and the confiscation of their apparatus.

CANADA.—Reuter's Montreal correspondent reports that the purchase of the majority of the shares of the Canadian Marconi Co. is announced by Messrs. Lazard Bros. & Co., of London. The shares are being transferred to a holding company in which Marconi's Wireless Telegraph Co., Ltd., and the Radio Corporation of America have taken substantial participation. The Lazard firm will, it is understood, control the holding company and, in order to ensure the control remaining permanently British, are forming a voting trust for 25 years. This trust holding voting control in the holding company will be vested in three trustees, two of whom are nominated by Lazards and one by the British Marconi Company. The first trustees will be Sir Robert Kindersley, Mr. R. H. Brand, and either Lord Inverforth or Mr. F. G. Kellaway. It is further announced that Sir Joseph Flavelle, chairman of the Canadian Bank of Commerce, has agreed to become chairman of the Canadian Marconi Co.

CHINA.—According to Harbin reports, says the same authority, the Chinese Eastern Railway Co. has decided to install radio receiving sets in the residences of the more important staff members and directors, as well as in the offices of the railway administration. The *Chinese Economic Bulletin* adds the information that altogether 35 sets of the 6-valve type have been ordered, and the installation will be gradually extended to other quarters in the near future.

COLOMBIA.—Reuter's Bogota agent informs us that the Government has concluded a contract with a German firm of electrical engineers for the erection of three wireless stations at Honda, Neiva and Ocana respectively. Plant and apparatus for a fourth high-power station, capable of communicating with both home and foreign stations, are being shipped shortly from Germany. The four installations (which will be supplementary to those at Barranquilla, Pasto, Manizales and Bucaramanga) will be erected under the superintendence of German engineers.

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CZECHO-SLOVAKIA.—*Licences.*—The number of registered wireless subscribers in the country totalled 210,000 on July 31 last.

FRANCE.—Having obtained from the French Government the requisite permission to land an additional cable at Le Havre, in order to give direct communication between France and North America, the Western Union Telegraph Company is, says *The Times*, making arrangements to lift one of its existing transatlantic cables now terminating at Penzance (England), and to connect it directly to Le Havre.

GERMANY.—According to *World Radio*, Berlin's relay transmitter on the Magdeburger Platz has closed down for good, and the wavelength thus freed has been taken over by the Augsberg plant in Bavaria.

The number of radio receiving licences in operation in Germany increased from 1,635,728 at the end of March last to 1,713,899 at the end of June, an advance of 78,171 in three months.

GREAT BRITAIN.—The Wireless Organisations' Advisory Committee, which includes representatives of the Radio Society of Great Britain, the Radio Association, the Wireless League, and the Wireless Association of Great Britain, has issued an interim report, in which it is stated that, "in the main, the distribution of programme material, as arranged by the B.B.C., is satisfactory to listeners." Among the suggestions made by the Committee, which either confirmed existing practice or were adopted by the B.B.C., were the following, says *The Times*:—

"The B.B.C. should undertake demonstrations of reception, in order that listeners might be accurately informed on the quality of reproduction they might reasonably expect for the expenditure of stated sums.

"A 'clear the ether' campaign, relative to interference with the reception of broadcast programmes, should be instituted in the autumn."

The following may be accepted, in general terms, as the present position of the B.B.C. *vis-à-vis* the question of Empire broadcasting:—

In pursuance of the policy of developing a practical basis for effective Empire broadcasting as rapidly as possible, an experimental short-wave transmitter is being erected at the Marconi works at Chelmsford, which will make use of the two 480-ft. masts situated there and carry out experiments, working chiefly on a wavelength of 24 metres; arrangements have been made for the collection and analysis of reports of these experiments in various parts of the world. The station, whose call sign is 5SW, will use power up to about 25 kw., and should its performance be unexpectedly successful in the early stages, programmes may be transmitted, but it is not anticipated that this experimental station will undertake a regular service. Satisfactory progress is being made with experiments in reception by the "spaced aerial" method. The success of Empire broadcasting depends mainly upon the possibility of transmission being re-radiated efficiently by local broadcasting stations, and it is therefore essential to devise a method of reception which will minimise the fading effect; signals from two or more aerials spaced at considerable distances apart may be combined and treated in such a way as to produce a more constant and undistorted signal. Taking into account the results of its last series of experiments, the B.B.C. sees no reason to revise its prediction that Empire broadcasting may be undertaken with the guarantee of the elementary conditions pre-requisite to service sometime during 1928. Contact is being maintained and developed with the broadcasting organisations of the Dominions and Colonies, while the chief engineer (now attending the World Wireless Conference at Washington) is evolving a further series of experiments in co-operation with the Radio Corporation of America.

The London Press announce that a radiogoniometric aerial, an ingenious piece of wireless apparatus which enables the exact position of an air liner in flight to be located, is to be erected on the top of the new 50-ft. control tower which has now been completed at Croydon Aerodrome.

All the Handley Page Napier and Silver Wing air liners of Imperial Airways have been fitted with wireless equipment which will transmit a signal to the new radiogoniometer.

Thus the traffic control officer, sitting in his office at Croydon Aerodrome, will be able to tell an air liner pilot who is flying above clouds or fog what his exact position in relation to the aerodrome is, and also on what compass course to fly in order to arrive over the aerodrome, even though he is unable to pick up any landmarks to guide him.

The Union of Post Office Workers has received a letter from the Postmaster-General with reference to the decline in telegraph traffic. The number of inland telegrams was 78,269,000 in 1912, and in 1920 it was 82,500,000. Since then the number has decreased yearly, and in 1926 it was 49,783,000. The Postmaster-General regrets that decreases in telegraph staff, both on the rank and file and on the supervising staff, are likely to be necessary. It will be recalled that recently a committee was set up by the Postmaster-General to examine the possibility of effecting substantial economies in the working by the State of the inland telegraph service. The Union of Post Office Workers is preparing a reply to the Postmaster-General.

The decrease in telegraph traffic, it will be noted, only refers to Inland telegrams, the long-distance telegraph traffic, i.e., Anglo-foreign and colonial, still shows the upward trend.

Wireless Apparatus Confiscated.—The magistrates at Eccles, Lancashire, heard a case in which the manager of a shop selling wireless materials at Swinton was charged with having installed and worked transmitting apparatus without possessing the necessary licence authorising him to do so. Mr. F. Elliott, solicitor, who appeared on behalf of the Postmaster-General to prosecute, said that the authorities took a grave view of the case. The defendant had radiated messages last year under the call sign "5OB," and this year under the call sign "2EZ." Two offences were involved—that of installing apparatus for sending purposes and that of working the apparatus. For each action a licence is required. The defendant admitted both sets of transmissions, and the Bench imposed a fine of £2 2*s.* for each offence, and the defendant's apparatus was confiscated.

Loud Speakers not to be Allowed!—West Ham, one of the most flourishing of London's suburbs, is desirous of adopting the recommendation of its Legal Committee and to bring into force a new bye-law duly sanctioned by the Home Office to deal with the matter of loudspeakers which become a nuisance. The new law, which had not yet been passed by the Council itself when we went to press, imposes a penalty not exceeding £5 on any person who "in any street or public place or in any shop, business premises, or place which adjoins any street or public place, and to which the public are admitted, shall operate a wireless loudspeaker or gramophone in such a manner as to cause annoyance or disturbance."

INDIA.—The conditions under which wireless licences are sanctioned in India differ considerably from the simple simplicity of those obtaining in Blighty!

According to the Indian correspondent of the *Electrical Review*, under the Indian Telegraph Act, the establishment, maintenance, and working of "telegraphs" (which includes wireless telegraphy and wireless telephony) in British India is illegal, except in accordance with a licence issued under that Act, and the Act specifies heavy penalties for the use of apparatus in British India without a licence. There are several kinds of licences: if it is desired only to receive broadcasting, the correct form of licence is the "broadcast receiver licence," which can be obtained by any one from any head post office in British India on the presentation of a completed application form and the licensing fee of Rs. 10. A broadcast receiver licence is valid for 11 months after the month of issue, and a fresh licence is necessary to continue to establish, maintain or work wireless apparatus after that date. A separate licence is required for each station or receiving set.

Licences to use wireless for other purposes, such as transmitting or experimental reception, are issued only after investigation, and application has to be made to the Director-General of Posts and Telegraphs (Wireless Branch), Simla, and from whom the applicant may easily be separated by a thousand and many more miles!

The above licences entitle the licensee to use a wireless set in the manner indicated. They do not entitle the licensee to import wireless apparatus into British India, for which a separate "import licence" is necessary under the Sea Customs Act. Import licences are also issued by the Director-General of Posts and Telegraphs (Wireless Branch), Simla; the fee is Rs. 10 per annum, and the licence is valid until the end of the year in which it is issued.

For the convenience of passengers to India who are bringing a single receiver with them, arrangements have been made by which the Customs officers at the principal ports, viz., Bombay, Calcutta, Madras, Karachi, Rangoon, and Dhanuskhodi, issue "temporary permits" in certain circumstances. A temporary permit will only cover one wireless receiver (or its component parts) accompanying a passenger as personal baggage. Application should be made on a form which can be obtained from the Customs officer. It must be accompanied by a fee of Rs. 10, and, provided the application is accepted by the Customs officer, a formal import licence will be subsequently issued by the Director-General of Posts and Telegraphs without further action by the passenger. The Customs duty assessed by the Customs officer is payable in addition to the import licence fee.

ITALY.—The B.B.C. announces the issue of the following statement: "The Council and different Commissions of the Union Internationale de Radiophonie, which met at Como in September, studied various questions relating to the development of radio-telephony. The Council examined and approved of projects for the development of an international spirit, in particular the broadcasting of national programmes. With a view to a closer collaboration in the future between broadcasting stations, the Council decided to invite programme directors to participate in certain schemes, and also considered the protection of broadcasting interests at the coming conference at Rome. Finally, it confirmed the enrolment of new members: Osakeyhtio Suomen Yleisradio at Helsingfors, la Société Romande de Radiophonie at Lausanne, and la Société Anonyme Turque de Téléphonie sans Fil at Stamboul, as active members; and the Broadcasting Corporation of Japan at Tokio as an associate member.

JAPAN.—A new national organisation has been formed under the name of the "Broadcasting Corporation of Japan," says the *Electrical Review*. It has amalgamated the three previous organisations at Tokio, Osaka and Nagoya. The country is now divided into territorial broadcasting divisions: Kanto (Eastern), Tokai (Central) and Kansai (Western), to which are being added: Kyushu (Southern Island), Chugoku (Central States), Tohoku (North Eastern), and Hokkaido (Northern Island). The old Tokio Broadcasting Bureau has taken the name of Kanto Division, but is still better known as the Tokio central broadcasting station, which explains that in accordance with the five-year plan of the new Corporation a new 10-kw. station is being built in the prefecture of Saitama, about 20 miles north of the city of Tokio, to replace the present 1-kw. station at Atagoyama in the city, which will

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be converted into a studio connected with Saitama. It is hoped that the new station will begin transmissions next spring. The total number of licensed listeners in Japan is 370,000, of whom 237,000 belong to the Kanto division.

JUGO-SLAVIA.—*World Radio* reports that a broadcasting station is to be erected shortly at Laibach. It will be ready for operation by next Easter and will be the largest in the country.

NEW ZEALAND.—Reuter's Trade Service announces that to minimise interference from Australian stations and the new high-power station at Wellington, the following new wavelengths have been allocated to New Zealand stations: IYA, 333 metres; 2YA, 420 metres, 3YA, 306 metres; and 4YA, 363 metres.

NORWAY.—A representative meeting of merchants, held at Oslo on Sept. 20, says Reuter's Agency, discussed the increased time required for the transmission of telegrams between Norway and England. It was stated that the average period for sending messages to London was now as high as 108 minutes, compared with 63 minutes previously, and it was suggested the delay took place in England. A resolution was passed urging the Norwegian telegraph administration to seek to remedy the evil.

It is understood from other sources that the figures quoted above do not at all represent the situation, but the matter is receiving the closest attention of the two administrations concerned.

SALVADOR.—The *Electrical Review*, in a recent issue, gives the following satisfactory report on the Telegraphs and Telephones in this Central American Republic, which "possesses efficient services of telephone and telegraph communication. The telephone system comprises more than 2,650 miles of line (of which 85 miles was erected in 1926) and 275 exchanges. The telegraph system embraces 1,000 miles of line and 250 telegraph stations. Twenty-five new offices with combined services were opened during 1926. In the capital, the telephone and telegraph lines are laid underground, and messages are transmitted through a new central telegraph and telephone office. The wireless telegraph station in San Salvador has been renovated recently, and new short-wave equipment installed, which will make it possible to send communications at all hours."

SIERRA LEONE.—Similar in quality is the report for 1926 of the Sierra Leone Railway Administration (which also manages the telegraph system of the country and the Freetown telephone system) shows that the total mileage of lines in operation at the end of the year increased by 25 to 1,269 miles; the total number of circuits on the Freetown telephone exchange increased by 9 to 106, and the number of telegrams dispatched increased by 1,032 to 70,552, the proportion of Government to public traffic being 17,826 to 52,726 telegrams. The number of subscribers (excluding the railway) on the telephone exchange was 55 (36 public and 19 Government). Telephone revenue increased by £693 to £2,133, due to Government subscribers, who previously paid half rates, paying full rates from January, 1926. Telegraph revenue decreased by £333 to £4,932, due to revision of charges.

SOUTH AFRICA.—By arrangement with the B.B.C., the Baldock-Smith boxing match at the Albert Hall on Oct. 6 was broadcast to South Africa by relaying the running commentary on the fight through Phillips Lamps, Ltd.'s Continental broadcasting station (PCJJ) at Eindhoven, Holland.

U.S.A.—A chain of 15 American and Canadian broadcasting stations, forming the second largest radio chain in the world, will be subject to British direction almost immediately as a result of an important scheme ratified in London last month. Contracts, states the *Daily Telegraph*, were signed on Sept. 4 between the American Telephone and Telegraph Co. and the Columbia Gramophone Co., whereby the Columbia Co. will open 15 stations, covering North America from the Atlantic coast to the Rocky Mountains, and broadcast its own musical programmes, in direct competition with the National Broadcasting Co.

I.B. Corporation v. *F.R. Commission*.—Of great interest, also, is the action of the International Broadcast Corporation in withdrawing the suit it had begun against the Federal Radio Commission in the Court of Appeals of the District of Columbia. The suit was brought for two purposes: to obtain for station WGL in New York City a better broadcast channel, and to test the legality of the 1927 Radio Act. *World Radio* says that the suit has been withdrawn, not because the Corporation believed the position it had taken to be a wrong one, but because it felt that whatever difficulties now exist can be adjusted by the co-operation of the broadcasting companies under the supervision of the Commission. It is also pointed out that should the Radio Act be declared unconstitutional at this time, conditions of chaos would be created.

According to the *Telegraph and Telephone Age*, high-powered radio broadcasting reached a new peak on Aug. 4, when a programme of WGY at Schenectady, N.Y., was broadcast at midnight from a new 100-kw. experimental transmitter. This test marked the first time that 100 kw. has been modulated and fed to an antenna for broadcast service. The Federal Radio Commission issued a special licence to operate with 100 kw. for 30 days, and specified the period from midnight to 1 a.m., eastern standard time. Comparison tests were made of transmissions by the 100- and 30-kw. transmitters. By means of this investigation, which is part of an extensive development programme, the radio engineers hope to improve the broadcast service.

In a report emanating from the Electrical Equipment Division of the Department of Commerce, it is estimated that 18,000,000 receiving sets are now in use throughout the world and that 200,000,000 sets would be required to serve all of the people within the constant reception area on a basis of five persons to each set. Fifty-seven countries now maintain broadcasting services.

Cables and Wireless.—The Mackay companies have acquired the wireless system of the Federal Telegraph Company, a Californian concern, the present service of which is limited to point-to-point and ship-to-shore transmission, but it is intended, says *The Times*, so to expand the system as to provide a wireless supplement to the existing cable service. The long-wave arc system will be employed for foreign transmission, while for inland work a short-wave will be used.

In this same connexion the following from the *Electrical Review* is equally interesting:—

"That the cable telegraph companies still have faith in their undertakings despite the development of 'wireless,' is once more demonstrated by the announcement of Mr. Newcomb Carlton, president of the Western Union Telegraph Co., that his Company proposes laying a modern cable between the United States and Japan to provide improved telegraph facilities between America and the Far East, at a cost of three million pounds. 'The need for improved cable communication has been emphasised by recent events in China, which justifies this outlay,' states Mr. Carlton. It is understood that the new cable will be of the 'Permalloy' type, which will permit of the sending of five or six messages simultaneously, and will have a total carrying capacity of 2,500 letters (500 words) per minute. At the time when American and British troops were landing in China, three cable systems were available for the use of the British Government, while only one cable connects China with the United States; of course, a wireless circuit is in operation between San Francisco and Japan, via Honolulu, but it is stated that it works very irregularly. This discrepancy has caused considerable embarrassment to Washington, which is naturally anxious to keep in close touch with the Chinese situation. The present Pacific cable was laid by the Commercial Pacific Cable Co. (one of the Mackay Companies' subsidiaries) in 1902, and runs from San Francisco to Honolulu, thence to Midway Island and Guam, where it branches off to Manila and Yokohama. The Commercial Company's reply to this threatened competition is the purchase of the Federal Radio Telegraph Company, whose circuit it intends to operate between San Francisco and Japan, in addition to its present cable. It is understood that the purchase price was about a million pounds sterling, and that the new wireless circuit will be in operation before the new Western Union cable can be made. The Commercial Company's radio circuit will be operated on the 'beam' system, now operating so successfully between Great Britain and the Dominions, a system which it is understood will also be shortly adopted on the Marconi transatlantic wireless circuit to New York, as well as to Buenos Aires."

The International Radiotelegraph Conference was opened in the Chamber of Commerce Building at Washington, on Oct. 4, by President Coolidge, who cordially welcomed the Conference on behalf of the people of the United States. The *Electrical Review*, London, has a special representative at Washington who will no doubt have an interesting, if very lengthy, report to make to the editor upon his return, which, according to information received as we go to press, is not yet! Some delegates are wondering if they will be in England again by Christmas. Having outlined the importance of the means of communication to civilisation, says the representative in a cablegram, and pointed out that radio could properly fulfil its mission only by the aid of international regulations, he expressed confidence that the Conference, by candid discussion and wise co-operation, would render radio an increased power in the service of humanity. The Conference having vigorously acclaimed the President's address, Mr. W. Kruyt, of the Dutch Telegraph Administration, and doyen of the Conference, expressed thanks for the President's generous welcome, and proposed Mr. Herbert Hoover, Secretary of Commerce and Head of the United States Delegation, as President of the Conference. Mr. Hoover took the chair, and said that the presence there of delegates from over seventy sovereign nations and representatives of over 40 communication companies was the highest proof of the outstanding importance of radio communication. He sketched its amazing growth since the last Convention of 1912, and said that developments necessitated international understanding on the use of the limited number of other channels available if the progress of this great branch of communications was not to be retarded. The allocation among different international services of whole bands of frequencies, from the highest to the lowest practicable, would be one of the major tasks of this Conference. He stressed the fact that the United States had, from the very nature of its constitutional organisation, left the creation, ownership and management of its communication systems to private enterprise, and was glad of the presence at the conference of representatives of the great companies which had so largely contributed to the growth and high efficiency of radio service; it was wholly fitting that they should be heard when policies to which they must conform were being determined. Progress in radio had not ceased, and he looked forward to great advances; while international agreements were necessary to orderly conduct, care was needed that regulation did not hamper progress. The Conference had great responsibility, but, if successful, would aid in spreading that human understanding which was the foundation of peace. The Conference stood in silence during the roll-call of deceased members of the last Conference. Colonel T. F. Purves, head of the British Delegation, expressed the pleasure of the Conference at being assembled in Washington, and gratitude to Mr. Secretary Hoover for presiding.

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It is regretted if one or two of the above items appear somewhat belatedly in these columns, and the only excuse the writer has to offer is one well known in telegraph circles, and is yclept "Pressure"!

Not often does the *Observer* trip, but in their issue of Sunday, Sept. 25, their Broadcasting Correspondent permits himself to write "120 to 150 volts at 20 milliammetres from the mains'! A new measure of distance, perhaps?

And that is how it was done! The *Westminster Gazette*, in one of its "Miniature Memoirs," relates the following:—

"When Mr. Taft gave his inaugural address as President of the United States a sudden blizzard swept across the country and blew down all the wires. In consequence, the inaugural speech did not appear in the newspapers. President Taft sent for Mr. Theodore Vail, who was then the head of the American Telephone and Telegraph Company, and complained. 'The wires must be put underground,' he said. 'But,' protested Mr. Vail, 'science has not gone so far.' 'Then science must go so far,' replied the President. And so the vast research departments of the Bell enterprise concentrated on the problem and found the solution. Coils and relays were devised and tried and to-day speech is possible across whole continents.

The report for the year ended June 30 last of the Halifax and Bermudas Cable Co., Ltd., states that the net result of working was a profit of £26,949, as compared with £28,322 in 1925-26. To this is added £62,554 brought forward, making £89,503. After deducting the interim dividend and £2,420 for repairs, there is a balance of £84,583. From this a final dividend of 5% free of tax, making 10% tax-free for the year, is to be paid, leaving £82,083 to be carried forward. The annual meeting was held on Sept. 22.

The expenses for the year ended Dec. 31, 1926, of the West India and Panama Telegraph Co., Ltd., exceeded the revenue by £1,383, and after providing for debenture interest, depreciation, &c., the deficit was increased to £10,267. This was added to the accumulated deficit brought forward, bringing the total to £121,338. The first and second preference dividends are paid up to June, 1919, but the ordinary shares have received nothing since 1918, when ½%, free of tax, was distributed.

So the Robot has actually arrived! According to news from New York, the Westinghouse Electric Manufacturing Company have installed a televocal system of remote control over an "automatic man" at the Washington water supply reservoirs, which (I do not intend to write *who*), in answer to telephonic enquiries from the distant Washington Water Department, replies with a characteristic note repeated six, seven, eight, or as many times as may happen to correspond with the depth of the water in feet in the reservoirs at the moment of the enquiry. An example of this system was exhibited at the Model Engineer Exhibition in London in September, and was mentioned in our last issue.

Major Raymond Phillips, it will be recalled, controlled the movements of a model train by calling out the words "stop," "back," &c., &c.

Since writing the above another claimant to the invention is put forward, in the person of Mr. Samuel Hanmer, an electrician, of Manchester, who claimed, says the *Evening Standard*, in 1924 to have perfected a device which could start or stop an electrical dynamo at the sound of the human voice.

Since that time Mr. Hanmer has improved his device, and he now claims that it can do anything performed by the American "mechanical man," whose invention was announced last week.

"The whole secret of the invention," Mr. Hanmer says, "lies in the attunement of a plate sensitive enough to respond to the vibrations of the human voice. The day is coming when the public will accept as commonplaces 'mechanical men,' which now appear to be marvels."

The Special Wireless Correspondent of the London *Daily Telegraph*, reporting on the London-Sydney short-wave transmission of Oct. 17, says that the relay lasted for about twenty minutes, bad atmospheric interference causing Keston to abandon the relays. Conditions improved for a time, enabling London to hear an announcement from 2FC, Sydney, together with the information that the time in Australia was "nine minutes past four on Monday morning, Oct. 17," and that this constituted the second Empire programme. An impressive part of the programme which followed was a genuine "coo-ee" call, and afterwards Mr. Peter Dawson sang "King Charles." Daventry experimental station, 5GB, relayed this programme as well as 5XX.

Mr. H. H. Young, district surveyor for St. Pancras, London, recently stated, while giving evidence at the St. Pancras Film Factory fire inquiry, that there is "a statutory obligation to give notice to the district surveyor of every hole, however small, to be made in a wall of any building."

Several of us thought of the exits of our "earths" and the inlets of our aerials, and the surveyor was approached on the question and gave the disturbing reply that the obligation applied to the installing of a listening-in set in an ordinary dwelling. Our hearts sank deeply at the decision. Mr. Young, however, appears to have added that he thought that no reasonable surveyor would expect to have notice of such cases, and the two million odd listeners are therefore all relying on the sweet reasonableness of district surveyors. It is fondly hoped that all surveyors will prove kind-hearted!

The *Electrical Review* for Oct. 7 gives a most interesting illustrated description in detail of the Round Island (Scilly Islands) Radio Beacon. This, the first beacon station to be put into regular commission by Trinity House, was designed by the Marconi Company to the specifications of the Trinity Brethren.

The signal for fair-weather periods consists of the call sign GGG in Morse, repeated at the rate of 15 words per minute for 47 seconds, followed by a prolonged dash of 10 seconds duration and terminated by one repetition of the call sign, the whole transmission taking 60 seconds exactly. It is followed by a silent period of three minutes in each case, and is repeated three times, covering a total of nine minutes every half-hour.

In view of these modern aids to navigation it is therefore not surprising to hear that there is a steady flow of orders from shipowners for new direction-finding apparatus. The writer knows of about fifty installations that have been ordered quite recently among, say, half a dozen firms.

A writer in *Nature* gives an account of certain experiments which had been made regarding the extent to which radio waves actually penetrated the earth, and cited those of Mr. Guy Allen of Boulder, who, on Aug. 17 last, in the Caribou Mine, Colorado, used a nine-valve super-heterodyne radio installation with which he had heard Lima, London, Madrid, &c.

At a depth of 220 ft. below the surface, clear of wire, rails and pipes, he readily detected KFEL Denver (248 metres), and the concert was well heard from the loudspeaker by all present. On proceeding to a depth of 550 ft, carrier-waves were detected, yet no clear reception was possible in the morning; but in the evening at 9.20 p.m. the party returned to the 550-ft. level, and at the end of a tortuous passage 80 ft. distant from all wires and pipes, speech, music and song from KOA Denver (326 metres) was heard from the loudspeaker about as clearly as on the surface earlier in the evening. In both cases the reception was by loop, and in both cases maximum intensity was obtained when the loop pointed within a few degrees of Denver, about fifty miles away.

Previous experiments in a tunnel at Montreal, Canada, had shown that 40-metre waves were weak in penetrating power; broadcasting waves were more efficient, while longer waves of 10,000 metres surpassed both.

The previous experiments referred to were probably those mentioned by Messrs. A. S. Eve and D. A. Keys, of the Mines Bureau, Washington. During these latter experiments the above-mentioned officials appear to have reported that broadcasting waves of, say, 400 metres appeared to be better and were detected by means of good amplification in the tunnel with 700 ft. of limestone and igneous rock above them. Longer waves, in the region of 10,000 metres, were detected more readily, but the Bureau of Mines trusts that some wireless enthusiasts may continue these experiments, and adds that accurate measurements of signal intensity would be specially useful.

The financial editor of the *Electrical Review* recently pointed out that on a certain date in October a coincidence happened which had not repeated itself since before 1907 when what is known as the "Eastern Quartette" all stood at the same price level on the Stock Exchange. The quartette is composed of the following telegraph cable stocks: Eastern Ordinary, Easter Extensions, Westerns and Globe Ordinary, and all "regained their composure and their strength," after "what may be called the periodical "Beam" slump in cable companies' stocks and shares had run its usual course.".

An interesting feature of *Supervising*, commencing with the number published on Sept 15, is a Biographia for Students of Telegraphs, Telephones and Posts, compiled by Mr. H. G. Sellars of the C.T.O. Cables and Wireless section. The Biographia is alphabetically arranged and so far appears likely to prove an all-embracing compendium, which will no doubt be agreed if only one item be quoted, viz., that of:—

> Argyl, John Douglas Sutherland, Duke of, b. 1845. Moved a resolution at the Mansion House, London, advocating low-priced telegraphic communication within the Empire, 11 December, 1908.

It is with the keenest regret that we have to record the death of Mr. F. Grafton, Superintendent, Inland Telegraphs, C.T.O. Deceased succumbed to a malignant disease at the age of 53 years, and at a point in his career which, humanly speaking, held more than ordinary promise.

Science and the Future.—If the virtues of men keep pace with their growing knowledge, and if they are willing to walk forward in peace, the needs of all will be satisfied, but nothing less than lofty motives will adequately cope with the increasing forces which humanity has to wield.—*The Advocate.*

J. J. T.

PRESENTATION TO MR. BENTON, ABERDEEN.

AN interesting presentation took place at the Second Annual Meeting of the Post Office Telephone Savings Association in Telephone House, Aberdeen, on Oct. 6, 1927, when, at the request of Mr. A. Clow, the Vice-Chairman, the Chairman of the Association, Mr. P. Edmond, District Manager, in a very happy speech asked the Hon. Treasurer of the Association, Mr. A. M. Benton, to accept a smoker's cabinet as a tangible expression of the appreciation of the members for all he so willingly and cheerfully had done for them during the two years the Association had been working. Mr. Benton, in thanking the members for the handsome gift, said that the work had been a real pleasure—indeed, he could truly say it had in reality been a labour of love—and the success which had attended the Association was in itself an ample reward.

This Savings Association, it may be mentioned, has a membership of 77. The total amount deposited was £1,507 3*s.* 6*d.*, and the total number of certificates purchased 1,883, at the end of its second year of working on Sept. 30, 1927.

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A BRIEF CHRONOLOGY FOR STUDENTS OF TELEGRAPHS, TELEPHONES AND POSTS.

BY HARRY G. SELLARS.

THE kind reception given to the paper on "Overseas Communication," which appeared in the *Telegraph and Telephone Journal* of January and February, 1927, encouraged the writer to continue and extend his researches with the object of demonstrating the historical progress of the three sister services which are of interest to so many persons in this and all other countries. An attempt has been made to give credit to all those whose work has been of assistance in building up the great worldwide system of communication, but it is realised that the story is incomplete and that many improvements in methods and apparatus have been effected by inventors in all parts of the globe whose names remain unrecorded, but who had the satisfaction of aiding development. Every effort has been made to quote accurate dates, but in many cases the negligence of historians, the gradual development of an idea, the private nature of laboratory experiments, the number of persons engaged in research and experiment, or the tardy publication of results, have sometimes led to uncertainty; and the correctness of dates cannot, therefore, be guaranteed. In cases where an accurate, or approximate, date could not be ascertained the item has been placed in parenthesis, at a point where it is likely to be of interest. Abstruse technical terms have been avoided with a view to rendering each note of interest to the non-technical mind. Foreign readers will comprehend that no disregard is intended to those of their countrymen who have laboured in the great cause, but whose names and achievements have not been recorded in these pages. Allusion has, however, been made to those whose names have emerged from the enormous number of co-workers of other nationalities and have reached this country. Our friends will also realise that, in many items, although not specifically stated, the *British* Post Office is the subject of reference.

B.C.

2634 ... ... Mariner's compass constructed by Hoang-ti, Emperor of China.

1150 ... ... Homer regarded the lodestone as being miraculous.

Travellers used the lodestone to guide them across the immense tracts of land in China, Manchuria, Siberia, and Tartary.

1000 ... ... Greeks, Egyptians, and Romans obtained lodestone from the province of Magnesia, Asia Minor, of which Heraclea was the chief city. It was frequently called Lapis Heracleus.

570 ... ... Thales thought the lodestone possessed reason, and mentioned the attracting properties of rubbed amber.

540 ... ... Pythagoras looked upon the lodestone as something supernatural.

536 ... ... Cyrus established a regular system of couriers and erected post-houses in Persia.

Aztecs and Chinese also had organised establishments of state letter carriers.

460 ... ... Anaxagoras regarded the lodestone as having a "soul."

430 ... ... Hippocrates believed the lodestone to be a purgative.

354 ... ... Aristotle described the electrical power of the torpedo fish.

208 ... ... Philip V of Macedon ordered reports to be made to him at Mount Tisseus, in Thessaly, by means of fire signals.

125 ... ... Various apparatus in use for signalling by means of fire, Polybius called them pyrsiae.

50 ... ... Lucretius observed the movements of iron filings under the influence of a magnet.

32 ... ... Theophrastus mentioned that amber (Gr. Elektron) and tourmaline had the power of attracting dry leaves and straw.

24 ... ... Augustus introduced couriers and post-houses in the Roman Empire.

A.D.

70 ... ... Pliny mentioned the electrical qualities of the lodestone, amber, tourmaline, and the torpedo fish.

382 ... ... First printed newspaper published in China.

415 ... ... Eustathius mentions the case of a man whose body occasionally emitted sparks and flame while dressing or undressing.

800 ... ... Charlemagne introduced couriers and posts into France

1098 ... ... Frode, of Iceland, in his writings, showed that the magnetic needle was used for navigation purposes in the eleventh century. It is recorded that the Chinese were aware that a suspended magnetic body did not point to the true north.

A.D.

1150 ... ... Guizot, of Provins, speaking of navigators, says "they possess a never-failing method by the virtue of the true marinière, an ugly and brown stone to which iron adheres of its own accord." He states that a needle was rubbed on the stone and that the point of the needle then "turns just against the pole-star in dark nights, when neither star nor moon are seen."

1210 ... ... Peter Pellegrinus noticed that the compass needle did not point due north.

1214 ... ... Roger Bacon born.

1250 ... ... Flags used for signalling in the British Navy.

Communication established between Austria and Italy by a connected line of letter posts.

1267 ... ... Polar attraction of the lodestone discovered by Roger Bacon. He was accused of dealing in magic and, being banished from England, took up residence in Paris. Bacon, who was a Franciscan friar, must be regarded as the pioneer of modern scientific research.

1275 ... ... Emperor of China introduced post houses. A fresh courier was provided for each stage which consisted of three miles. The runners wore small bells round the waist to herald their approach, so that no delay occurred in relaying the correspondence.

1294 ... ... Roger Bacon died.

1302 ... ... Flavio Gioja, of Naples, improved the mariner's compass.

1447 ... ... Printed newspapers issued in Germany and Venice. At Venice the news could be seen on payment of a "gazetta."

1455 ... ... Scottish Parliament approved a system of signalling by means of burning faggots, indicating to the Lowlanders the various movements of their English enemies.

1463 ... ... Louis XI established post-houses in France.

1464, May 15 ... Letters first forwarded by post in England.

1481 ... ... Edward IV introduced post-horse riders to bring news from Scotland in twenty-mile stages.

1482 ... ... Edward IV organised a system of dispatch riders.

1483 ... ... Richard III improved the system of posts which had been set up in 1481.

1484 ... ... Richard III followed the example of Edward IV and used relays of riders to carry dispatches. A Master of the Posts was appointed.

1492 ... ... Columbus discovered the declination of the compass needle from the geographical meridian.

1516 ... ... Brian Tuke occupied the position of Master of the Posts.

1533 ... ... Tuke explained the condition of the posts to Thomas Cromwell.

1540 ... ... William Gilbert born at Colchester.

1543 ... ... Post-horse arrangements existed in various parts of England.

1555 ... ... Regulations issued in connexion with the Posts on the London-Dover Road.

1568 ... ... British Government established a Post Office for foreign letters.

1576 ... ... Robert Norman discovered that a balanced magnetised needle dipped towards the north. He constructed a dipping needle and found the angle of dip in London to be 71 deg. 50 min.

1580 ... ... Declination of compass needle in London 11 degrees 15 min. E.

1581 ... ... Queen Elizabeth appointed Thomas Randolph first chief postmaster of England.

1588, July 29 ... Defeat of Spanish Armada signalled by beacon fires.

1589, Mar. 28 ... Richard Sackville born.

1591 ... ... Elizabeth issued a Proclamation relative to the carriage of private letters, and ordered that all foreign letters should pass through the Posts.

1594 ... ... Shakespeare may be considered to have foretold telegraphy in a "Midsummer Night's Dream." Act II, Scene I, where Puck addresses Oberon in the following words, "I'll put a girdle round about the earth in forty minutes."

1598 ... ... Posts to Ireland established via Bristol and via Holyhead.

1600, April ... Gilbert expounded theories on terrestrial magnetism and electricity. He discovered that a large number of substances, which he called "electrics," attracted light bodies when rubbed. (Gilbert's name has been adopted as the unit of magneto motive force.)

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A.D.

1600, Dec. ... Postal arrangements with East Indies, Cape of Good Hope, Mauritius, etc., in hands of East India Company.

Gilbert devised the earliest electroscope. In the course of experiments he found that iron bars set upright acquired magnetism and that a bar of steel heated and cooled while lying in the magnetic meridian acquired magnetic polarity.

1602 ... ... Jost Bing, of Hesse, invented a measuring compass.

Otto von Guericke born at Magdeburg.

1603 ... ... Post to Berwick, for Scotland, organised, and instructions issued for all the Posts.

Dr. William Gilbert died.

1605 ... ... Bacon used for cryptography the five-unit code afterwards adopted by Whitehouse, Burnett, and Baudot.

1607 ... ... James I appointed Lord Stanhope "Master of the messengers and runners . . . within the King's dominions."

1609 ... ... Posts maintained by the English Crown at a loss of £3,400 per annum. Monopoly in the carriage of letters vested in the State.

1615 ... ... First daily newspaper appeared in Frankfort-on-Main.

1619, Feb. ... James I. of England, established the office of Postmaster for Foreign Parts out of the King's Domains, and appointed to the post two London merchants named de Questers (father and son).

1619, Nov. ... Thomas Witherings made "Postmaster of England for foreign parts."

1620 ... ... Post to Plymouth organised.

1622 ... ... First English newspaper appeared in London.

1631 ... ... William Frizell, appointed foreign postmaster by Charles I, ordered a regular service to be run between London and Edinburgh.

1633, Mar. 16 ... Thomas Witherings again took up the appointment of Postmaster for Foreign Parts, and established a service between England and the Continent.

1635 ... ... Witherings organised the Posts, with a scale of postage rates, according to weight and distance. Rates of postage :—

Under 80 miles	... ...	2 pence.
80 to 140 „	... ...	4 „
Over 140 „	... ...	6 „
Scotland	... ...	8 „

Prideaux, successor of Witherings, paid a rent of £5,000 per annum for the profits from Posts.

Post communications were available between London and most towns in England, Ireland, and Scotland.

1642 ... ... Earl of Warwick held the post of Master of the Posts by assignment from Thomas Witherings.

1642, Dec. 25 ... Isaac Newton born at Woolsthorpe, Lincolnshire.

1643 ... ... A Post Office erected under parliamentary orders in Cloak Lane, near Dowgate Hill, London.

1649 ... ... Net revenue of Post Office, £5,000.

1650 ... ... Otto von Guericke devised the first electrical machine, consisting of a globe of sulphur which was revolved and rubbed with the hand.

Von Guericke first observed that sparks and flashes of light could be obtained from electrified bodies when discharged.

1653 ... ... Prideaux retired. Rent of the Posts raised to £10,000.

1657 ... ... The compass needle in London pointed due north and south.

1657, June 9 ... A Bill "for settling the Postage of England, Scotland, and Ireland" received the consent of the Lord Protector. The Bill provided for the appointment of a "Postmaster-General of England and Comptroller of the Post Office," an office which the Lord Protector might grant in return for a yearly rent.

Post Office endeavoured to control incoming letters from abroad.

Post Office removed to the "Black Swan," Bishopsgate Street, London.

1660 ... ... Post Office granted "in farm" to Henry Bishop for seven years at a rental of £21,500 per annum. John Wildman acted as manager.

"Franking" of postal correspondence granted to Members of Parliament. Minimum rate of postage between London and Manchester reduced to 3d.

Homeward bound ships ordered by Act of Parliament to give up all letters at the port of arrival.

(To be continued.)

FIFTY YEARS WITH TELEPHONE PIONEERS.*

BY T. A. PROUT.

SHAKESPEARE has it that "thoughts are but dreams till their effects be tried," and Emerson that "the ancestor of every action is a thought."

Certain it is that pioneers, the men and women "who go before to prepare the way for others," are necessary in all ages and are "the salt of the earth." The derivation of our word Pioneer suggests that it means literally a "foot soldier," and it is not surprising if his lot is usually a hard one.

I am attempting a review of a period of 50 years. Well now, is a half-century a long or a short period ? It depends, no doubt, on the point of view. On the one hand it is so *long* as to be the greater part of the Psalmist's tale of "threescore years and ten," and so *long* that it takes us back to the days before the advent of telephone exchanges, electric lighting, or motor-cars.

On the other hand, this half-century is so *short* that when it began some men here were riding their old "penny-farthing" bicycles with a 60-in. wheel in front and one of a few inches diameter following behind—ladies didn't ride bicycles in those far-off days.

The same period is so short, too, that Sir Oliver Lodge, who is still amongst us and in the front row of pioneers, was a married man before our period opens in 1877.

If Sir Oliver Lodge at 76 years of age can evince his enthusiastic interest in such characters as that of the great Faraday, whose figure you have before you in marble, and the pioneers in astronomy such as Galileo, "let us now praise famous men" beginning with *Phillip Reiss*, the German electrician who in 1861 exhibited at Frankfort apparatus which he described as a telephone and which succeeded in transmitting by electrical means musical and other sounds. This was a near approach to a satisfactory telephone, and I believe that Germany is now very intent on trying to establish that Reiss was the first inventor of the telephone.

Other inventors made interesting contributions about this time, and curious to relate, one, Mr. Royal E. House, of Binghampton, N.Y., invented and patented an "electro-phonetic-telegraph" which was capable of operating as a magneto telephone in the same manner as the instrument subsequently and independently invented by *Alexander Graham Bell*. Mr. House appears to have "built better than he knew," as unfortunately for him he did not realise the capabilities of the apparatus he had himself devised, and thus the broad fact must be taken that Bell was the first man to produce and make known publicly the apparatus for the transmission of articulate speech and any other sound to a distance by electrical means, and to carry his discovery to a successful conclusion. Bell was a Scotsman who lived in Edinburgh until he was 24 years of age. He was then—in 1870—mainly for health reasons, taken by his father, Mr. Melville Bell, to Canada.

He was accompanied by his brother, and though well versed in science he was less proficient in business affairs. The story of Bell's life is one of great interest and fascination. At 15 years of age he made a model of a skull of gutta percha and by working a bellows was able to make it say "Papa—Mama." He also had a Skye terrier at this time which he taught to stand on its hind legs and growl while he manipulated its throat and mouth in such a way that certain vowel sounds were produced. The absorbing passion alike of father and son was to bring science to the aid of the deaf. Following upon a lecture by his father at Boston on his system of visible speech for the education of the deaf which he had already introduced into London schools, his son Graham was offered a salary of £100 a year to instruct teachers in his father's visible writing system, and he took up his duties in April, 1871.

He made the acquaintance of a Mr. Thomas Sanders, a leather merchant, whose little boy, then 5 years of age, had been born deaf.

Mr. Sanders got Bell to take the little boy as a private pupil in the Bell system of lip reading, and so marvellously successful was the teacher that Mr. Sanders gratefully sought for some means whereby he could show his appreciation to Bell, who was at the time like some other inventors, feeling after some way of sending more than one message at the same moment over a single telegraph wire.

Mr. Sanders offered Bell the use of an attic in his house for a workshop and to supply him with money for making his experiments. Graham Bell also made the acquaintance of Mr. Gardner Hubbard, a well-known Boston lawyer, whose daughter Mabel had lost her hearing as the result of an attack of scarlet fever. Mr. Hubbard agreed to join Mr. Sanders in helping Bell financially, and later on Miss Mabel Hubbard, who received great benefit from the Bell system of visible speech, became the wife of our famous inventor, the founder of the vast telephone business. When Bell began to talk of the possibility of *speaking* over a telegraph wire, his wise and sympathetic friends were of the opinion that there was not much in *that* idea but if he found that it could be done it would be interesting. In the fullness of time in the afternoon of June 2, 1875, while experimenting with a reed receiver the spring stopped vibrating.

* Paper read before the London Telephone & Telegraph Society.

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Bell's assistant at the time, Mr. Thomas A. Watson, whose name in connexion with the invention of the telephone is now almost as widely known as that of Bell, snapped the spring with his finger, on which Bell rushed to where Watson was to find out what had happened. It was thus that Bell, when 28 years of age, first heard the baby cry of the invention destined to revolutionise the then existing slower methods of conducting business and social intercourse the wide world over. Bell not unnaturally resigned his position as a teacher and on Mar. 3, 1875—his 29th birthday—was granted the world famous patent No. 174465 which was soon to become and for years to remain the centre of fast and furious attacks in a long series of about 600 patent law suits.

On Mar. 10, 1876, in Boston, the human voice came clearly over a wire for the first time in the world's history.

Mr. Watson, who heard Bell speak on that memorable occasion, says that it made such a deep impression upon him that he wrote the sentence down in a book which, it is not a matter of wonder to hear, he has always preserved The simple words were :—

"Mr. Watson. Come here. I want you."

When we think of the extraordinary demands we now make of the telephone to transmit speech clearly under the most adverse conditions of stress and noise, even in the midst of the noisy machinery of a tank in motion, as was done on Salisbury Plain this summer, it is curious to read that during this summer of 1877 the proud inventor's statement that "the telephone was now talking so well that one did'nt have to ask the other "man to say it over again more than 3 or 4 times before one could understand "quite well, if the sentences were simple."

In August, 1876, young Bell was contemplating a trial of speech transmission over the 5 miles from his house at Tutela Heights into Brantford, Ontario. He cleaned the town shops out of their stocks of stove-pipe wire to run along his father's fence to the junction at Mount Pleasant Road where he would connect it to the telegraph wire leading into Brantford.

We can picture the scene. There was a family named Brooks living across the road opposite the Bell homestead. The son Thomas Brooks was carting grain from an adjoining field. What could be more natural than for Bell to ask Tom Brooks to give him a hand with the plaguey stove-pipe wire. Brooks asked him to wait till the afternoon when he would finish his job without blocking the lane, and then he and his next-door neighbour, E. McIntyre, would help to string the wire.

The first words the inventor heard on this occasion were spoken from Brantford by his uncle, David Bell, the familiar ones from Hamlet :—

"To be or not to be, . . ."

In 1906, nearly 30 years afterwards, Dr. Bell, on re-visiting his old home at Tutela Heights, was pleased and proud to meet the two men who had thus helped him to put up the first telephone line in Canada.

It is not strange that in Canada, where the telephone is so widely developed as only to be second—and a very good second—to the U.S.A., Brantford is known as the Telephone City. On Oct. 24, 1917, the Duke of Devonshire, when Governor-General of Canada, unveiled a fine monument in honour of Graham Bell's invention.

I am much indebted for the slides shown to-night to a sumptuous volume entitled "Pioneering the Telephone in Canada," privately printed at Montreal in 1926, in commemoration of the 50th anniversary of the Telephone. My possession of this Pioneer's limited edition is due to the courtesy of Mr. Charles Fleetwood Sise, the President of the Bell Telephone Co. of Canada.

In an inspiring dedication of the book to all who with head, heart, and hand contribute to the upbuilding of the great public telephone service, it is truly said that :—

"The leaders in the great army of Telephone workers have been "men in whom zeal for service burned with a steady flame. And in the rank "and file there has been from the first something of the churchman's and "the soldier's devotion to duty."

Dr. Bell passed from this life on Aug. 4, 1922, at his summer residence at Cape Breton. His remains were buried on the following Friday in a grave hewn out of the solid rock, and for the space of one minute during the ceremony of burial all communication was suspended over the vast entire network serving the 17 million telephones in the U.S.A. and Canada, as a tribute to the memory of the man whose beautifully simple invention had brought this mighty business into being.

I must here part from Bell, however reluctantly, as truly there are many others who must even in the short time at my disposal, be mentioned. There is Elisha Gray, who applied in America for a patent for a telephone within an hour or two of Bell having deposited his application, but Gray allowed his apparatus to remain undeveloped, and after some litigation both patents were acquired by one company.

As might be expected Edison, the inventive wizard, quickly entered the telephone arena opened up by Bell, and Edison produced a carbon transmitter. It was no sooner pointed out to Edison that his transmitter would be sterile so long as he could not use the existing receiver, than he characteristically undertook, although in the throes of great discoveries in electric lighting, to produce a receiver entirely different to Bell's to act with his own carbon transmitter, and he was not slow in delivering the goods, as his nephew, C. P. Edison, reached England with Edison's ingenious chalk receiver in March, 1879. I wonder what young Edison thought of our beloved English climate that summer.

Our summer of 1927 was not in it with 1879. It rained day and night almost continuously till Sept. 30 and was followed by a glorious Indian summer in October. May history once more repeat itself! The Edison Telephone Co. was quickly formed in London and an exchange service offered at £12 per annum against the £20 of the Bell Company.

It May 1878 the genial Professor David Hughes, a Londoner who had gone out to America, had given the telephone industry then in its infancy a great fillip by his invention of the microphone, and many of us soon got busy listening for the first time to the noisy footsteps of the common house fly while parading on the microphonic wooden floor. Hughes was the inventor also of the famous printing telegraph which bears his name. Fortunately for the future history of telephony Hughes did not patent the microphone, and from it sprang many types of carbon transmitters. Hughes' action had, however, avoided endless complications attendant on patents litigation.

In 1879-80 Francis Blake followed in the train and produced his famous carbon button transmitter which was a great favourite for the many years before very long trunk circuits became available, when it became less suitable. I spoke from Liverpool to London in 1903 with a Blake transmitter alternately with other transmitters then coming along and considered to be its superior, and the clear articulation of the "Blake" excited comment from the listeners at the London end. It is interesting to find that the dear old "Blake" transmitter was resurrected from the dead as recently as 1922 and placed under trial by the B.B.C. with other types of transmitter, with a view to broadcasting, because of the old reputation of the Blake for faithful articulation.

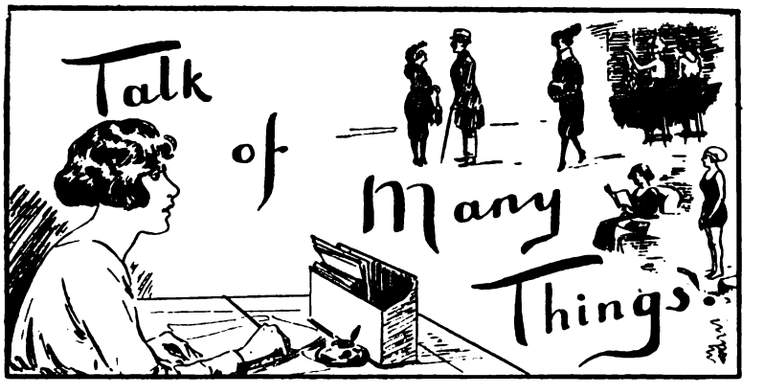
Contemporaneously with Blake's production of his transmitter the Rev. Henry Hunnings, then a curate at Bolton Percy, near York, constructed a highly successful granular carbon transmitter which was an advance on any instrument then known, and he had no difficulty in getting £1,000 for it, and this transmitter was used by the Globe Telephone Co. in their fight for subscribers in London. Mr. Hunnings was aided and advised by his friend Mr. Cox Walker, an astute telegraph engineer who was at the moment running an optical business in York. Mr. Cox Walker, now 85 years of age, was a great figure in the telephone turmoil of the first ten years.

So many present to-night know more than I do of the far more recent great advance in telephony which followed Dr. Michael Pupin's practical application of Mr. Oliver Heaviside's mathematical theories which extended back to 1887, by the invention of the loading coil in 1900 nearly half-way on in the half-century under review. Further advances in the problems of transmission have followed from work done by Mr. Wm. Duddell of oscillograph fame, as well as from the researches carried out by Mr. B. S. Cohen and Mr. J. G. Hill, Post Office Engineers.

Later still the satisfactory transmission of speech over immense distances through underground conductors has been rendered possible by the evolution of the telephonic repeater—the fond dream of telephone men for forty years—by the adaptation of the vacuum oscillating valve invented by Professor Fleming of London University.

(To be continued.)

WE TELEPHONISTS



Some Summer.

AFTER listening to the accounts given by colleagues of their experiences this year on annual leave, and comparing them with my own, it appears that most of us have either weathered the storm or stormed the weather. Not a few of us have done both. The particular clerk of the weather who conceived the notion of measuring rainfall in *millimetres* instead of *inches* will have been able to enjoy his excellent joke to the full this year. I am unable to confirm the rumour that he has died laughing or to hold out any hope that this fate may yet overtake him. In the same spirit of inspired

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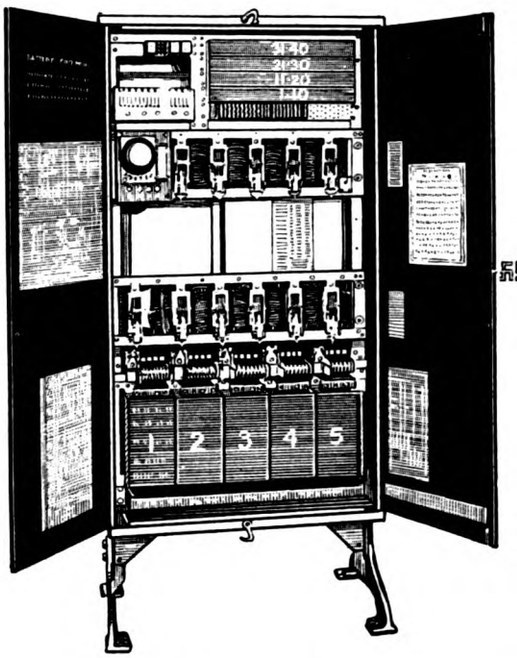

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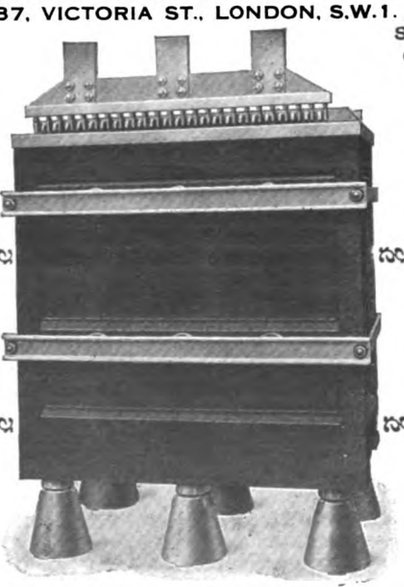

MADE at the LARGEST BATTERY WORKS IN THE BRITISH EMPIRE.

MAKERS OF THE EXIDE BATTERY.

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optimism and gay abandon, however, I will make him a present of an idea which may not have occurred to him—to express sunshine in therms and the velocity of the wind in inches per hour.

"Sunshine," say you, with a bitter laugh. "Yes, sunshine," I said, and I want to say more about it, or rather, about the sun. Personally, I think there's too much fuss made about the sun. He doesn't bother about us, so why should we concern ourselves about him? He shines because he can't help it—shines in a relentless and impersonal sort of way with an entire absence of any emotion of friendliness. It is true that we owe everything to him, but it is only when love prompts the gift that gratitude becomes real. Much the same applies to the moon, but she, being nearer, seems to evince rather more interest in us. She is cold and aloof, however, and her pale light serves only to deepen the shadows and invest them with a mystery.

Now the wind and the rain are different. With them you have personal and intimate contact with Dame Nature. You may be alone, but you can never be lonely in their company. The wind caresses and buffets and teases. Sometimes his persistence bores or his ceaseless chatter irritates. Hide from him and he finds you suddenly and with a great laugh shakes you into humour again. Occasionally he breaks out into an orgy of wildness as though he were sowing oats. Then he reminds you of a vigorous and undisciplined human—uncertain, changeable, but, withal, lovable at heart. Does he not sob and sigh as if in repentance? And the rain, too—soothing and cooling or raging and freezing, lashing your face or laving your brow. He drops from the heaven and seems at once to establish contact with all that is unworldly and pure. He brings with him the conviction that there is that which is above and beyond the petty importances of earth. Even in their wildest and maddest moments the wind and the rain are friendly and much more personal than the impassive and imperturbable sun and moon. They are wild and uncertain, not placid and inevitable. They are the living vivid expression of the nature around you, and they make you realise that you are a part of nature rather than a mere spectator present on sufferance.

But it was a beastly summer, wasn't it?

PERCY FLAGE.

To Mr. Flage.

I thank you for your words of cheer,
Received on Wednesday over here.
Your answer filled us all with glee,
And banished all the double D.
Why blush unseen within your bower?
And hide your head like modest flower?
Perchance we've met in traffic jam,
Or at friend Lipton's buying ham.
Who knows! we may have been detected,
Both choosing eggs marked large "Selected."
And last amidst these rains and fogs
Perhaps we've jostled at the dogs!

D. D.

A Telephone Romance.

(Continued.)

On the second day of the honeymoon the bride "Expressed" a wish to go for a boat trip, so they went down to the "Riverside," where they managed to "Annexe" a boat called "The Frobisher," in which they sailed past "Greenwich" and eventually arrived at "Richmond." The bride (although enjoying the trip) felt rather nervous and would not "Abandon" the "Hatch End" of the boat until assured by the bridegroom that there was no "Prospect" of any danger.

And now a late description of the going-away attire will no doubt be welcomed by my readers.

The bride (who looked a "Howler") was robed in a dress of "Buff cord" trimmed with "Red sleeves" and "Finished" with a "Blue print" collar; she also wore a beautiful "Opal" "Ring" which "Flashed" in the light. The bridegroom wore a "Royal" blue suit (which suited his "Spare" "Figure") and also a "Purley" grey tie. During the trip the bridegroom waxed rather sentimental, and among other endearing "Expressions" he called the bride (whose nickname was "Peg") his little "Pink peg," and enquired anxiously whether she had yet regretted her "First choice"; his "Answer" was the "Glow" in her "Clear" eyes.

They arrived at their hotel that night happy but hungry, and found a meal already prepared consisting of a "Langham," and after a short "Pause" the bride partook of a piece of "Tottenham" cake, the bridegroom contenting himself with a "double."

The next day was spent in packing their "Trunks," and as the bridegroom was due at the "Treasury" at a "Fixed time" they had to use "pressure" to get to the "Junction."

On reaching the station they found that the "Line" was "Blocked," and on "enquiry" of the "Traffic Officer" "on duty" they were told that no "Tickets" would be issued as the "Line was temporarily out of service" due to the fact that an "Express" had become derailed, and no "Traffic" could possibly "Filter" through.

On hearing this, the bridegroom did not "display" any annoyance but immediately arranged that they should return by "Tandem."

This they managed to borrow from the hotel. The bride, who was rather "keyed up," had some difficulty in mounting, and had to "Hop" several times before getting her balance. After pedalling "Automatically" for a "long distance" the bride's skirt suddenly became "In contact" with the "Number plate," which caused them to "Tee over."

D. D.

(For further adventures of the happy couple see our next issue.)

Ten Little Gold Plugs.

Ten little gold plugs, all in a line,
One in the "Busy-Back," then there were nine.
Nine little idle plugs, solemnly did wait,
One up the "Multiple," then there were eight.
Eight little bright plugs, like sunbeams of heaven
One on to "Fault-Desk," then there were seven.
Seven little quiet plugs, one in a fix,
One capped "out of order," then there were six.
Six little gay plugs, as bees in a hive,
Connected one to "T.T.," then there were five.
Five little shining plugs, the quarter of a score,
One in the "Junction Test," and then there were four.
Four little straight plugs, docile as can be,
One through to "Supervisor," then there were three.
Three little coloured plugs, cords green and blue,
One in the "Holding," then there were two.
Two little comrade plugs, sharing all the fun,
One joined the "Break-Jack," then there was one.
One little lonely plug, cord all undone,
Off came his little jacket, then there were none.

V. M. G. C., Paddington.

London Telephonists' Society.

All those who to the meeting went to welcome our new President Miss James) were one and all entranced as into bygone days she glanced. "Notes from My Diary" was the trend; we listened, breathless, to the end. We heard, with pleasure, many names of those who'd gladly served Miss James. There was, it seems, a Mr. Pink (that was the name I heard, I think) who, when he found things going wrong, would hurry forward with a song. And then a certain Mr. France would help still further with a dance. Again, we heard how dear Miss Reekie, when tempers frayed and nerves grew creaky, would soothe and hush and calm and bless, with unremitting tenderness. (O ay, di mi, what charming ways they had in those dear, bygone days!) Much more we heard—then, at the close, numbers of orators arose. Miss James had said, as one inured, muffled transmission could be cured in babies and transmitters too, by patting them, as mothers do. One speaker, Mr. Valentine, said, after praising auld lang syne, *he* did not know, as know he should, that patting babies made them good. (Well, *we've* known many a baby ruffled, but *never* with "Transmission muffled"!) Miss Cox arose directly after and caused great merriment and laughter saying Miss James's old-time drill had caused the wreckage in Cornhill. In speech quite free from platitude Miss Nurse expressed her gratitude, then strove to add to memory's stream, but (gracefully) forgot her theme. All these, and many more, we heard, but from telephonists—no word. Were they a vow of silence keeping? Or (let me whisper) were they sleeping? It was, indeed, a merry night, the speeches good, the paper bright; but how I wish it had been true—becaue it wasn't (*entre nous*, Miss James, in answer to *enquiary* said she had never kept a diary!)

The 4th November is the next event, "Psychology" the text, when Captain Reid, in words profound, his latest theories will propound. With lantern slides his points he'll mark, so means to keep us "in the dark." Please note the place, the time, the date—a Friday night and don't be late.

Contributions to this column should be addressed: THE EDITRESS, "Talk of Many Things," *Telegraph and Telephone Journal*, Secretary's Office, G.P.O. (North), London, E.C.1.

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LONDON TELEPHONE SERVICE NOTES.

Accounts Branch.

THE retirement on the last day of September of Mr. A. E. Young removes a very well-known personality from Cornwall House. Mr. Young, who celebrated his 60th birthday and the commencement of his 43rd year of service on Sept. 28, started his career as a postman in the Eastern District. In 1889 he was transferred to the indoor staff and appointed an Adult Messenger in the Secretary's Office, and when the Post Office London Telephone Service came into being, Mr. Young was one of its earliest recruits, being transferred on Dec. 31, 1901. In March, 1904, he was promoted to the rank of Assistant Head Messenger, a position he held until his retirement, being in charge of all uniform staff at Headquarters.

Mr. Stirling presided at a little presentation ceremony on Sept. 30 and in a happy speech pointed out that the title of Mr. Young's rank did not at all describe his duties. Mr. Young made what, he said, was his maiden speech in acknowledgment of the cheque for £17 which Mr. Stirling had just handed to him on behalf of all grades of the staff, and stated that the money would be spent on a new table and wardrobe for the cottage at Misterton, in Somerset, where he hopes to spend a happy and busy retirement in the cultivation of an extensive garden. A separate presentation of a book was made by the Registry staff, and at a farewell tea given by Mr. Young to the Boy Messengers, he was the recipient of a silver-mounted Malacca cane.

The Rana Ladies' Swimming Club (Controller's Office) held their annual Gala at St. George's Baths on Oct. 10, when a crowded audience saw a very interesting programme.

Among important events decided on this occasion was the 60 yards Championship for the Liddiard Cup which was retained by last year's winner, Miss B. E. D. Taylor, after a very close contest. The final of the Civil Service Breast Stroke Championship was again won by Miss D. M. House, of Regent Exchange, and a team from that Exchange also won the Invitation Team Race.

The 120 yards men's Team Race for the "Lotus" Shield resulted in the return of that trophy, which had been held several years by the Accounts Branch, to the Traffic Branch.

A number of humorous items kept the audience in constant laughter, not the least amusing being the unrehearsed incidents. A "Greyhound Race" was a topical item, complete with a very realistic hare, and kennels—to say nothing of the barking of the "hounds"—while a "Life Saving" event illustrating the averting of a tragedy in the flooded Thames Valley and including five rescues from a watery grave was one of the most entertaining items of the evening, even though the audience persisted in thinking it farce, and not tragedy at all.

A thrilling water polo match between the City of Westminster and Amateur Club, a clever display of Fancy Swimming, and Floating by ladies of the "Naiad" Club, and an exhibition of diving by members of the Amateur Diving Association, including the high diving champion of all England, completed a programme full of good things.

During an interval Miss J. Liddiard, M.B.E., Lady Superintendent, distributed the prizes which included a special presentation to the Club's instructress, Miss L. F. Varndell, whose excellent tuition was evident throughout the evening. Members were pleased to see the Controller and Deputy Controller present.

* * * *

Contract Branch.

The volume of business done by the Contract Branch during the month of September and the quarter ended Sept. 30 was as follows:—

	Stations.	
	September.	*Quarter ended September.*
New business obtained	7,693	20,877
Ceasements	4,529	11,336
Net gain	3,164	9,541

The net gain for September last year amounted to 3,190, and that for September, 1925, to 3,429, so that this year's figure cannot be regarded as satisfactory. It is stated in some quarters that the trade outlook is improving appreciably, and it is hoped that this will materialise and reveal itself in the figures for next month.

The number of exhibitors at this year's Motor Show was 543, and orders were taken for 398 exhibition lines as compared with 380 last year and 372 in 1925. The fact that only 73% of the exhibitors this year rented lines shows that there is still room for propaganda work on the value of the telephone amongst motor manufacturers.

The practice of enclosing reply post-cards with the quarterly accounts pointing out the advantages of extension telephones has yielded such good results that it is being continued. One was sent out with the last batch of accounts and another is being prepared for the next.

We have heard a great deal lately from the morning papers about the small number of telephones per 1,000 population in this country as compared with the United States and the necessity for intensive propaganda to reduce the disparity. It might be a good thing if some of the newspapers looked into the possibility of making greater use of the telephone in their own businesses as one of the foremost in this campaign has only one-seventh the number of exchange lines and one-third the number of extensions that are provided for a New York newspaper with only a third of its circulation.

* * * *

L.T.S. Football Team.

When the process of building up a football team is entered upon the first games played invariably reveal wide contrasts in ability and style, and it is not easy to find out exactly the best position a player should occupy, and in junior football particularly a player's inclination for a certain position does not always mean that it is the place he will be most useful in. This task of weeding out and changing about occupied several weeks before anything in the nature of the most useful eleven could be seen, and, even now, owing to recent welcome acquisitions to the playing strength from the traffic side, the team is still experimental.

The first match was played on Sept. 24, against a Kingston team known as Beverley, and was lost by 3 goals to 2.

The league tournament opened on Oct. 1, when Nathismus were entertained, and a spirited and fluctuating game resulted in a win for the visitors by 4 goals to 3. Nathismus undoubtedly played the prettier football and deserved to win, but the winners were the first to admit that they were indeed lucky to get away with two points. The L.T.S. quickly registered two good goals and held the lead until nearly half-time, when a long shot was allowed to escape the grasp of the home goalkeeper.

The last and winning goal was the result of a penalty award for hands. As the incident occurred close on time and was the result of the ball rising unexpectedly from the ground rather than any deliberate action on the part of the player it was unfortunate that the first match should be lost under such circumstances.

On the whole the display was satisfactory, and with one or two places strengthened the team is expected to hold its own in the league competition.

* * * *

London Telephonists' Society.

The first meeting of the London Telephonists' Society for the 1927-28 session was held in the City of London Y.M.C.A., Aldersgate Street, on Friday, Oct. 7.

The earlier part of the evening was devoted to music, vocal and pianoforte, which was provided by members of the staffs of Gerrard and Regent Exchanges, to whom thanks are due for their kindness in thus contributing towards the success of the evening.

The chair was taken by Mr. Hinshelwood, and after his introduction of the new President, Miss James proceeded to read the presidential address.

The interest which such a title as "Notes from My Diary" would naturally arouse, increased as Miss James read, and her references to the gaping shutters of magneto working at "Queen Vic.," and the lists of numbers to be memorised, drew reminiscent sighs of sympathy from many of her hearers, while the information that refreshment clubs occasionally refunded all or part of the weekly subscriptions of their members, gave, to those whose service had not embraced such pleasures, a feeling of infinite sadness. Miss James referred to the rigid adherence to Post Office Rules which was expected of every officer, and pointed out how necessary such training is; how desirable as an aid to thoroughness, and as an invaluable means of self-discipline.

The advantages to be derived from the classes which are arranged, in many cases on exchange premises, in all subjects, were mentioned, and a hope expressed that some of the results might, later in the year, be given in the form of competition papers.

At the conclusion of the address great enthusiasm was shown by all, and further reminiscences were added by many.

The meeting was then closed with an expression of appreciation to Miss James for a very pleasant and interesting evening.

* * * *

Victoria Exchange.

On May 31 and June 1 respectively, the staff of Victoria Exchange helped with a Bazaar held in Westminster Hospital in aid of funds for the hospital. The Victoria staff were responsible for the sweets and chocolate stall, and at the conclusion of the Bazaar they very proudly handed over to the hospital authorities the sum of one hundred guineas.

Everyone was delighted with the result, and our efforts were much appreciated by the matron and nursing staff.

We have since been very gratified to learn that Miss Butler, "in recognition of valuable services rendered," has been elected an Honorary Life Governor of the Hospital.

* * * *

L.T.S. Swimming Association.

The results of the Annual Gala held on Oct. 14 will be included in next month's notes.

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THE

Telegraph and Telephone Journal.

VOL. XIV. DECEMBER, 1927. No. 153.

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Subscription: To the public, 5s. 0d. per annum, including postage. To the Staff, 3s., including free delivery to any Post, Telegraph, or Telephone Office. Single Copies: To the Public, 4d. each, or post free 5d. To the Staff, 3d. each. Orders should be sent to the Managing Editor, TELEGRAPH AND TELEPHONE JOURNAL, *G.P.O. North, London, E.C.*1

All correspondence relating to advertisements should be addressed to MESSRS. SELLS, LTD., 168, *Fleet Street, London, E.C.*4.

TELEGRAPH AND TELEPHONE MEN AND WOMEN.

XLVII.

MR. J. R. M. ELLIOTT.

MR. J. R. M. ELLIOTT, Superintending Engineer for the Northern District of England, was born on Aug. 9, 1869, and, as may be inferred from his name, is of North Country stock. He entered the Post Office Service at Newcastle-on-Tyne as a Telegraphist in May, 1885, and transferred to the Engineering Department as a Relay Clerk in December, 1891. In 1896 he came to the Engineer-in-Chief's Office as an Engineer, Second Class, and he remained in London for nearly thirteen years, rising in the interval to the position of Technical Officer. In April, 1909 he went back to Newcastle-on-Tyne as Assistant Superintending Engineer, and three years later, on the retirement of Mr. Robb, he became the Superintending Engineer of the district.

Although Mr. Elliott left Headquarters over eighteen years ago, he is still remembered there as a telegraph technician of a high order. The Wheatstone system, which he did much to develop, has in the course of time been largely superseded by other systems, but in its day it was the mainstay of British telegraph practice. Mr. Elliott, like most Post Office engineers, has more to do nowadays with the telephone system than with the telegraph system, but the condition of the telephone plant in the Northern District is evidence that Mr. Elliott's technical abilities are by no means confined to the older service.

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ROUTINE TESTING—AND WHY WE DO IT.

By G. PYBUS (*Headquarters Traffic Section*).

INFALLIBILITY, unfortunately, is an attribute only of the gods. In common with all things human, telephone plant and apparatus, no matter how carefully handled and attended to, are liable to failures which sometimes have consequences totally out of proportion to the importance of the piece of apparatus involved. Happily, however, the better the condition in which the apparatus generally is kept, and the more attention that is paid to the detection of incipient faults and weaknesses, in a like degree is the liability of failure reduced. With telephone apparatus it can, perhaps, safely be said that "Prevention is better than cure," and it is mainly with this object in view that systematic routine testing is undertaken in exchanges.

There is, however, another reason for making these tests, which is the compilation of statistics bearing on the fault liability of exchange apparatus and plant. From the exchange and engineering fault reports, summaries are prepared, the substance of which eventually reaches the Engineer-in-Chief's Headquarters staff, and there, by careful scrutiny and comparisons, attention is broadly directed by reason of the high proportion of faults to possible sources of weakness in, say, a type of apparatus. As the knowledge of where the trouble lies is usually half the battle towards its rectification, this information is of the utmost value as by following the clues supplied initially by the routine tests the exact location of the trouble can be determined, and this is followed, in due course, by an improvement in the design of the guilty apparatus, if such is possible.

Faults are bound to occur in even the best regulated exchanges no matter what care and attention is given. It should not be assumed that the finding of a large number of faults during routine tests is evidence of poor exchange maintenance, as such a state of affairs is usually and normally accompanied by few faults being found outside the periods of testing. It will be appreciated that most of the faults which are discovered outside the testing periods are brought to light owing to trouble having been experienced by subscribers and, therefore, the more faults that are found during the routine tests the better it is for all concerned.

As readers of this *Journal* are no doubt aware, routine testing in exchanges is mainly performed by the traffic staff under the guidance—although this may possibly be invisible to the casual observer—of the engineering staff. In the little game of "Telephony" as played under modern rules, the dividing line which separates engineering work from traffic work is sometimes remarkably elusive, and the case of routine testing is perhaps one of the best examples of this.

Recently, the methods of conducting and reporting routine tests have been remodelled and the new system, which came into operation on Oct. 1 last, is now generally in force throughout the country. Under the revised system all tests have been allocated "Test Code Numbers," co-ordination has been achieved between the traffic and engineering branches, and any tendency to the overlapping of work—if such existed—has been eliminated.

Routine tests may now be divided under two main classes, i.e. :—

(1) Those reported on a routine test form which are treated throughout as routine test fault reports ; and

(2) Those reported on other forms which are—although found during a routine test—treated as non-routine or ordinary faults.

Broadly speaking, the motive underlying this classification is to separate those faults which are peculiar to a particular subscriber's or junction circuit from those which are found on what may be termed "common" plant. Discerning readers may hesitate to accept this broad classification, and may possibly instance the fact that calling signals are definitely associated with a certain subscriber but yet are due to be reported on a routine test form. This departure from the general principle is explained by the fact that the apparatus involved in this case, although not "common" is practically similar in exchanges of a like type, and the inclusion of any faults found in the routine test summaries permits of a review of this type of apparatus being obtained. Reasons for other departures will, no doubt, be readily deduced.

Most faults found under class (2) are later entered on the fault cards of the subscriber or junction, and, so far as this brief survey is concerned, cease to interest from this point. Those found under class (1) however, have an effect for a long time afterwards, and although they only interest the exchange until the faults are cleared their influence is ultimately felt throughout the service, owing to the pressure they help to exert through the study of the summaries in which they are included.

As regards the use of Test Code numbers, these, in addition to simplifying the form in which summaries are prepared, assist in reducing the amount of descriptive matter which requires to be passed by an exchange when the results of routine tests are reported elsewhere.

Another little point which—particularly to the traffic staff—may have attracted attention, but may not be clear, is the significance of the last four words of the phrase *Positions or sections tested—or to be tested*, which appear on the routine test form. The form is designed for the joint use of both traffic and engineering staffs, and it is when the form is used by the latter and issued as a guide for certain work to be done that the words referred to are used. The issuing officer in such cases is issuing an instruction for certain defined work to be carried out and the form, in these circumstances, is not a record of work done—until after its completion—as is the case when the form is used by the traffic staff.

As time passes and the exact value of the different routine tests now being made becomes apparent such alterations as are found necessary will be made. Certain tests may possibly be omitted or the periodicity altered to meet changed conditions and so, as with all things telephonic, routine testing will keep abreast of the times.

TELEPHONE AND TELEGRAPH SOCIETY OF LONDON.

AT the second meeting of the season on Monday, Nov. 21, at the Institution of Electrical Engineers, Sir Henry Bunbury, K.C.B., the Comptroller and Accountant-General of the Post Office, read to an interested and representative audience a paper on Telegraph and Telephone Finance, a subject on which, of course, he is an authority. The paper gave rise to plenty of discussion, which largely resolved itself into a thirst for further information on the part of his critics. Sir Henry replied to these Rosa Dartles at considerable length, leaving but few queries unanswered.

We hope to reproduce his paper in full in our next issue.

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AUTOMATIC TELEPHONY.

BY C. W. BROWN.

VIII.—(*Continued from page* 32.)

It will be appreciated that the selected scheme will be influenced by the size of the junction group between the manual and automatic exchanges. It will obviously reduce the amount of B equipment necessary at the automatic exchange if direct sending is provided at manual exchanges having a large number of junctions to an automatic exchange, but other factors operate also, such as space,

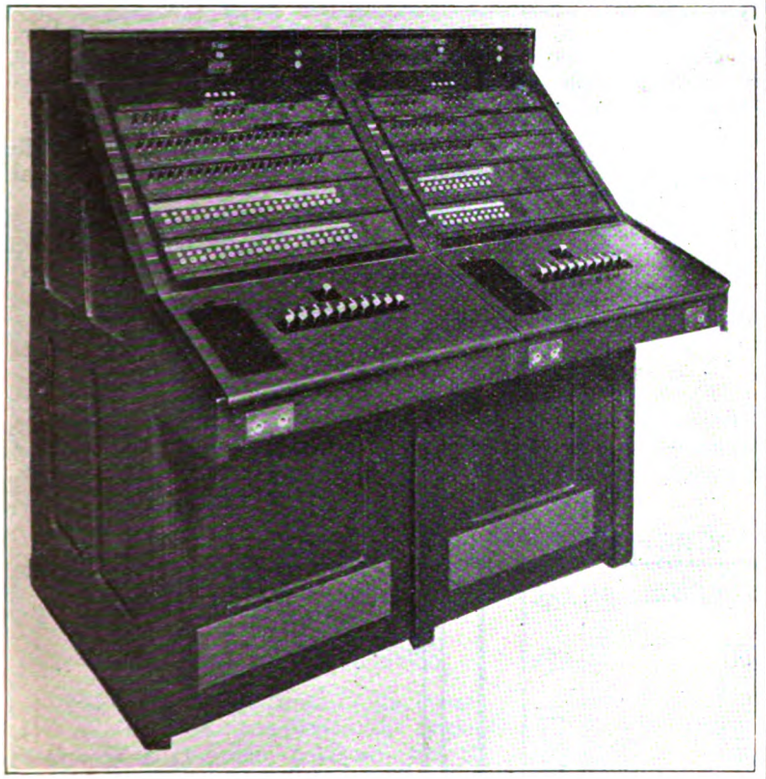

FIG. 8.

the number of automatic exchanges to which large groups of junctions exist, &c., while it must not be overlooked that B positions will always be available at the automatic exchange. Key sending and not dial sending would, of course, be provided at manual exchanges when necessary.

The B positions provided at automatic exchanges are of special type, as will be seen from Figs. 8, 9 and 10.

The absence of a multiple on the positions makes plugs and cords unnecessary. As a result, negative supervision is given. Each junction—there is accommodation for 50—has an assignment key, combined disconnection and order wire emergency key and a junction lamp. The positions each have accommodation for five order wires led through keys for use in conjunction with the junction order wire emergency key, for replacing faulty order wires. The junction lamp glows continuously while a call is in progress, the darkened condition indicating that it is free. Facilities are

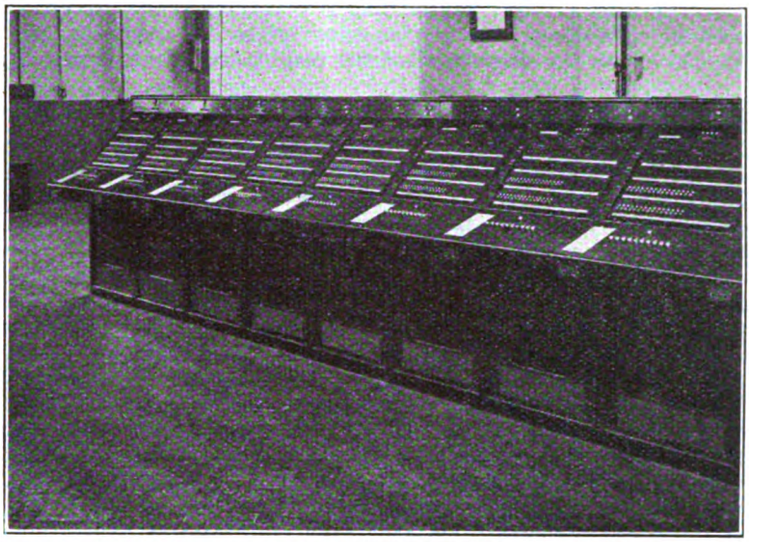

FIG. 9.

provided for cancelling a faulty "set up" by the operator both when it occurs during the setting up or after the last digit has been keyed. Impulses pass out to the associated selector only when the full number of digits has been keyed and the distant A operator has taken the junction concerned. If either of these operations are delayed, the apparatus that has been operated and held is automatically released, a few seconds' grace only being given.

Should an A operator take up a wrong junction, a distinctive "flicker" signal is received on the junction lamp of the circuit taken, thus the B operator is informed of the condition. The flicker signal is also given if the available sending equipment is engaged when an assignment key is depressed. The senders are usually in groups, and a given number of positions have access to the group; each position has simultaneous access to a number of senders, in the case of London, four; when the four channels are engaged, the fact is advised to the operator by means of lamp signals. During keying by the B operator, the position is guarded by means of a tone, so that A operators will not pass requests while the B operator is engaged in keying a call, thereby eliminating the risk of confusion and the possibility of wrong keying.

FIG. 10.

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"Cordless B" or "key sending B" working is the expression used in connection with the foregoing method of operating, and Fig. 11 shows the disposition of the main items of equipment.

Tandem switching.

The routing of traffic will fall into two categories: (*a*) that routed over direct junction routes, and (*b*) that routed over indirect junction routes. The former has been substantially described already. The latter is met by the provision of Tandem centres, from which small groups of junctions radiate to the exchanges concerned, junctions being provided between the tandem centres for cross area traffic. In London, at the outset, one tandem centre only is provided having small junction groups to all exchanges in the fee area. The scheme will be seen from Fig. 12, which is a representative diagram of a Director area such as London. The whole of the junctions outgoing from Tandem are located on the banks of selectors, the junctions incoming being connected to selectors. Those selectors that are reached by automatic exchanges are clearly tandem selectors, being situated between code selectors at the originating exchange and numerical selectors at the called exchange. On calls from automatic exchanges and manual exchanges they are situated between code selectors and the call indicator equipment. To cater for manual to automatic traffic, the junctions from the manual exchanges are terminated on selectors, teed into special B positions in a manner similar to the arrangement for manual to automatic direct working. The tandem operator, however, has facilities for sending codes as well as digits, the sender equipment being arranged to function as a translator as well as having "coding" facilities for calls destined for manual exchanges.

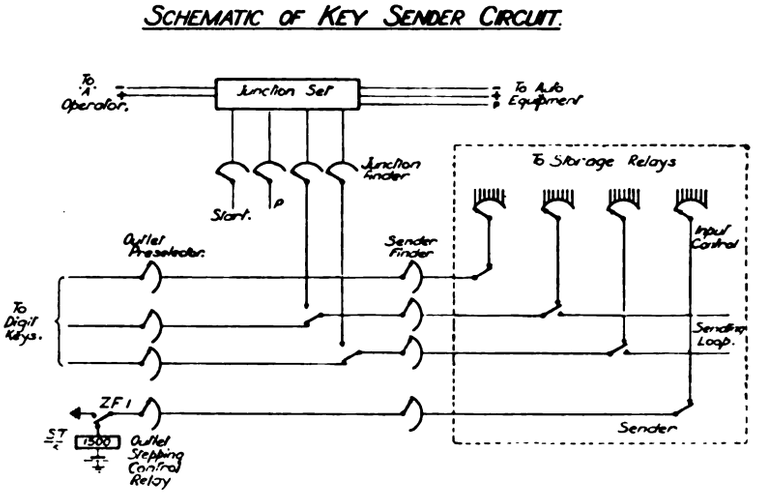

FIG. 11.

The tandem exchange is thus virtually divided, fully automatic traffic being handled mechanically while traffic between manual

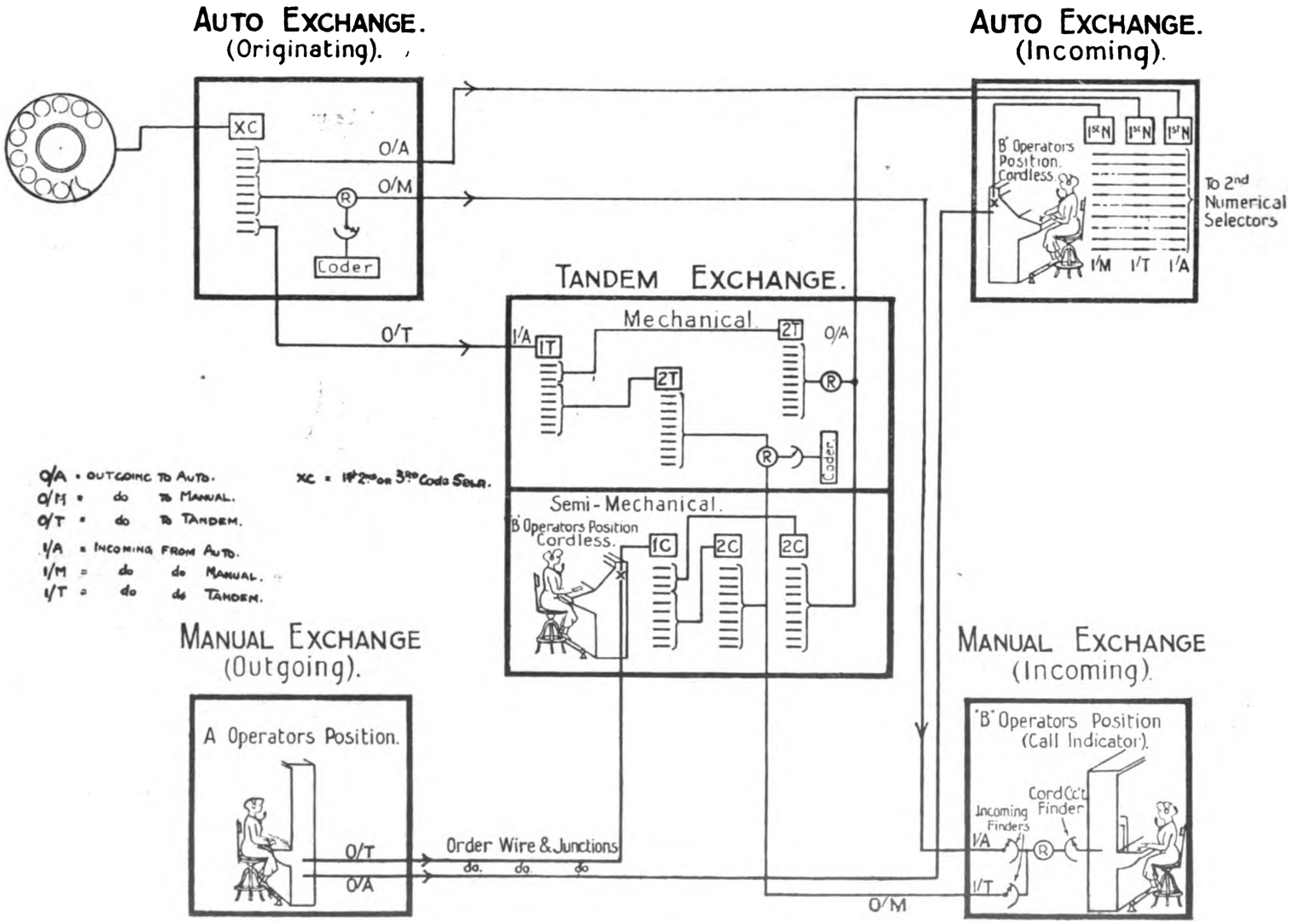

FIG. 12.

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and automatic exchanges and between manual exchanges is manually and mechanically handled. The junction groups from the tandem exchange are jointly used for both classes of traffic. The expressions "mechanical tandem" (M.T.) and "semi-mechanical tandem" (S.M.T.) are frequently used to identify the separate portions.

Manual to manual traffic.

A reference to the figure will make clear that this class of traffic, when handled via tandem, is routed to call indicator positions at the incoming manual exchange. It has been stated that this facility will enable the concentration of all traffic to a few positions during slack periods, thus enabling the closing down of direct junction routes, with a consequent economy without loss of efficiency.

It will be appreciated that as the conversion from manual to automatic working progresses, the call indicator equipment will be thrown out of use and the traffic via S.M.T. will gradually reduce as full mechanical tandem working increases.

In concluding these articles on "Automatic Telephony," the writer would point out that many other facilities than those described are provided in a modern automatic telephone system, amongst which are fault testing, dial testing, trunk offering, service observation, fault alarm schemes and routine testing. With the exception of trunking and grading, the main items have been covered, however. To those who wish to delve into the latter phase, many excellent publications exist, notably the professional papers of the Institution of P.O. Electrical Engineers.

(*Conclusion.*)

NOTICE.

In consequence of the great demand for numbers of the *Journal* containing instalments of this article, most of the issues from April last are out of print. The *Editor* will be glad, therefore, if any agents who may hold unsold copies of those issues will return them to him.

REVIEWS.

"*Television for the Home.*" *By Ronald F. Tiltman, F.R.S.A., A.Rad.A., with an introduction by Professor A. M. Low, D.Sc.* (*Hutchinson & Co., Ltd., London.*)

This little book makes no pretence to be a guide to the investigator or even to the technical student. The author states that his aim has been "to give a popular outline of Television for the ordinary man or woman" who may be interested in the subject of the televisor, the telenoctovisor, and last, but not least, in the history and successful struggles of the British inventor, Mr. G. L. Baird.

In these objects Mr. Tiltman has certainly succeeded. Every line of the hundred odd pages, with its excellent illustrations and clear type, is of intense interest, while no Service library is likely to regret the half-crown spent on the purchase of a copy. One must, however, be permitted to suggest that the title chosen for what is really a *history* of Television is hardly the most apt, seeing that only two out of the ten chapters deal with the *home* side of the matter. "Image," on page 68, should evidently read "imagine," and, with other little slips, will no doubt be corrected in any future edition. On page 25 the following phrase appears "so Conservative an office as the Post Office," and is surely not intended to convey the impression of political bias on the part of St. Martin's-le-Grand!

J. J. T.

"*B.B.C. Handbook, 1928.*" (*Price 2s. net.*)

We have received an advance copy of this handbook, which deals with the many problems of broadcasting in all its aspects. The genesis of the scheme in this country and its rapid development are described and the probable future lines of growth are forecast. A general description of the proposed regional system is given in some detail with all the pros and cons. The only complaint we have to make about the book is that it is too full of "meat."

"*The Earth and the Stars.*" *By Charles G. Abbot.* (*Published by Chapman & Hall, Ltd., 11, Henrietta Street, W.C.2. 264 pp. Price 15s. net.*)

The present year has witnessed a great increase in popular interest in astronomical matters owing to the bicentenary of the death of Sir Isaac Newton, which occurred in March, the total solar eclipse in June, and the transit of Mercury across the sun's disc last month. The need has accordingly been felt for a good non-technical account of the present position of astronomical science, and this want has been very well met by the volume under review.

The author is an expert in his subject, being the Director of the Smithsonian Astrophysical Observatory, but, unlike so many experts, he has in addition to a deep knowledge of his subject the ability to impart it in a helpful and interesting manner.

In the first chapter a general review is given of the heavenly bodies which are within reach of naked eye observation.

The second chapter is devoted to an account of the famous men who have advanced our knowledge of the Universe, from the time of the Greeks to the present day, and of the instruments which have been and are now employed.

The third chapter deals briefly with modern atomic theory in its applications to astrophysics, and with spectrum analysis.

The fourth chapter deals with the earth, considered as a heavenly body, and with its neighbour the moon. In the next chapter the story of the solar system is continued, embracing the remaining planets, the comets, and meteorites.

The sixth chapter is devoted to the dimensions and composition of the sun, and the seventh to the sunspots and other curious phenomena which appear from time to time on its surface, and to the effect of sunspots on the electrical state of the earth. This chapter concludes with an account of solar eclipses.

The following chapter deals with the energy radiated from the sun, and its relation to life on the surface of the earth.

The next chapter is devoted to those applications of astronomy in our everyday life which concern the keeping of the calendar and navigation.

In the tenth chapter is given a delightful account of the principal constellations, in which the brighter stars have been arranged with the mythological stories connected with them.

The eleventh chapter is devoted to a more serious description of the stellar universe, with an account of the distribution and structure of the stars as revealed by modern research. The following chapter deals with the distances, sizes and motions of the stars, and the next one with new stars, variable stars, star clusters and nebulae. In the final chapter is given an account of the various theories which have been advanced to explain the origin of the Universe.

An appendix contains a note on the total solar eclipse of Jan. 24, 1925, an account of the tides, tables giving data of the solar system and of the principal stars, a list of the constellations, and a useful glossary of astronomical terms.

The book is very fully illustrated, the illustrations including many beautiful photographs of star clusters and nebulae, and we can thoroughly recommend it to all who wish to have a very readable and at the same time authoritative and up-to-date account of the fascinating science with which it deals.

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TELEGRAPHIC MEMORABILIA.

ALASKA.—The centre of the earthquake recorded on seismographs on Oct. 24 was, apparently, in the Pacific Ocean, but Alaska suffered a shaking. A telegraph submarine cable was broken in two places—near Wrangell, 50 miles from Petersburg, and between Juneau and Skagway.

AUSTRALIA.—There has been quite an abnormal quantity of happenings of late—in the Australian Press, at any rate—regarding both cables and radio matters, making it a very difficult matter to select the most interesting items without mangling such by condensation or resorting to, perhaps, the lesser evil of omitting information altogether. To take two non-debatable paragraphs first :—

The *Electrical Engineer of Australia and New Zealand*, in commenting on the creation by the Commonwealth Government of a separate branch of the Postmaster-General's Department to deal with wireless activities, shows that up to the present the wireless business of the Department has been controlled, together with the telegraph service, by one branch, under Mr. J. Malone, Chief Manager of Telegraphs and Wireless. Under the new arrangement a new office is being created (that of Chief Inspector, Wireless Branch) with a salary of from £720 to £792 a year, and the wireless staff will be separated from the telegraph branch and placed under the supervision of the new officer.

Australian statistics for the year ended June last show, says the Melbourne correspondent of the *Daily Telegraph*, that the number of words carried in both directions reached the total of 27,670,000, of which the Pacific Cable Board handled 11,960,000 and the Eastern Telegraph Co. 15,710,000 words. Of the international traffic originating and terminating in Australia, the United Kingdom was responsible for 12,000,000 words, the United States for 2,700,000, and other countries for 4,800,000. The figures for New Zealand and the Pacific Islands were 5,900,000, and for messages in transit, mainly from New Zealand through the Eastern Company, 2,300,000. A feature is the fact that the international cable traffic was actually higher than in the previous year, despite three months of "beam" competition. According to the present traffic returns, as quoted by the *Daily Telegraph*, the "beam" system is carrying about 60% of the total United Kingdom business, the proportion being less for full-rate messages and higher for the cheaper classes of traffic. The Commonwealth terminal charges are stated to have amounted to £217,000 last year.

Arrangements have been made by the Associated Radio Company to erect a short-wave broadcasting station as an adjunct to the Melbourne station, 3AR, which will use a wave of 55 metres. The power to be used at the outset will be 250 watts.

According to *World Radio*, the Commission has recommended, *inter alia*, that the control of broadcasting remain in the hands of the Postmaster-General as at present, subject to administration by a committee comprising the Director of Postal Services as chairman, an officer of the Wireless Services (presumably a Government servant) and a "Broadcasting Officer" (presumably appointed from one of the broadcasting stations). Re-allocation of wavelengths between the present bands and the location of all existing stations to be reviewed, B-class stations (which receive no revenue from the licence fees) to be limited in power; that no fee be charged for the licence of a blind person; that definite wave-bands be allotted to amateurs; that radio traders be compelled to keep a register of the names of all persons who purchase complete receiving sets, to be available for inspection by radio inspectors; that the charges for performing rights on copyright music be reduced to 4*d*. per item (instead of about 1*s*. 10*d*.), of 5% of the gross revenue of the station, no limit being placed upon the number of items broadcast; and that the patent rights charged by Amalgamated Wireless (Australasia), Ltd (holder of Marconi patents), be reduced from 5*s*. per listener's licence to 2*s*. (this charge is collected from the broadcasting stations at present).

That in States where there are more than one A-class station steps should be taken to ensure that they will not broadcast news matter, including sporting news, simultaneously; A-class stations are also recommended to provide announcers who are proficient in the correct use and pronunciation of the English language. That stations be called upon to include advanced educational matter in their programmes. Further, that the Commonwealth Government re-acquire all land and coastal stations and that an Inter-Departmental Committee should co-ordinate various wireless services from the point of view of defence. The Commission finds that the public has little to complain of in the programmes broadcast; it recommends that the stations in sparsely-populated States like Tasmania and West Australia should receive a subsidy of £5,000 a year each from the revenue of the stations in the States like Victoria and New South Wales.

Reuter's Canberra representative states that in the House of Representatives in connexion with the proposed fresh agreement with Amalgamated Wireless (Australia), Ltd., Mr. S. M. Bruce, Prime Minister, said a problem which might arise in the future was the rival merits of the wireless and cable services; probably the cables were essential to defence, and were necessary as an auxiliary to the wireless services. The co-ordination of these methods of communication might have to be faced, and it might be suggested that co-ordination would be difficult to effect if the success of the "beam" system proved phenomenal; the Commonwealth would not allow such a position to arise. The Company, he announced, had agreed to pay terminal charges from March 28, 1926, the amount due being approximately £25,000. On the basis of nine million words per annum, the Company would pay approximately £45,000. The Commonwealth had agreed to make a contribution of £45,000 a year for the maintenance of coastal stations in exchange for the terminal rates, the Company agreeing to pay the Commonwealth 30% of the revenue from the stations. The average losses of the stations for the five years of Government control had been £34,000.

The third broadcast to the Empire from Australia on Oct. 30 was much more successful than the second, a fortnight previously, which had to be abandoned owing to the bad atmospheric conditions. A special programme was transmitted by 2FC, the Sydney station, on a short wavelength, and was picked up at the B.B.C. listening post at Keston, and re-broadcast from 2LO, 5XX and 5GB, whence it could be heard by listeners throughout the country. As the time, "Four o'clock, Monday morning, at Sydney" (Oct. 31) was being announced, clocks could be heard striking 6 p.m. (Oct. 30, Sunday) in England. Much of the programme was heard with ease.

CANADA.—The *T. & T. Age* states that Mr. W. D. Robb, vice-president of the telegraph service of the Canadian National Railways, and Mr. W. G. Barber, general manager, Canadian National Telegraph Service, visited the Maritime Provinces recently to inspect the telegraph lines along the railway, with a view to the acquisition of those east of Moncton, over which the Western Union Telegraph Co. operates commercial business. In 1924 the Canadian National took over the Western Union Co.'s lines in British Columbia, and the taking over of the lines in the Maritime Provinces has been under consideration since. Western Union Telegraph Co.'s officials from the United States also visited the Maritime Provinces recently in connexion with the matter.

GREAT BRITAIN.—The *Board of Trade Journal* says that a special feature of the London Section of the British Industries Fair, 1928, will be the wireless section, in which upwards of fifty representative manufacturing firms are to present an exhibit larger in size and more representative in scope than the wireless section at any previous British Industries Fair. It will be one of the largest and most comprehensive displays of the British wireless trade which will have been seen in this country. The great strides which the industry has made since 1923, the year of its inception, will be effectively shown. Overseas buyers interested in this section should pay special attention to the exhibits of the latest type of portable wireless set; of special valves adapted to work from alternating current mains; screened grid valves and gramophone pick-ups.

The fourth Manchester Wireless Exhibition, which was held at the end of October, too late to report upon in our last month's issue, was a distinct success. There were over one hundred stands showing the very latest products of the chief radio factories.

Loud-speakers of every conceivable style, most of them of exceptionally artistic design, were well to the fore. The running of radio receivers from the electricity supply was also well in evidence.

The following statement has been issued by the board: "The attention of the Marconi Company has been called to reports to the effect that the company has come to an arrangement with the cable companies or is discussing such an arrangement, and that the opposition to the company's petition for the Court's approval of its capital reduction scheme has been withdrawn. In view of the extent to which these rumours have been circulated, the company thinks it necessary to state that there is no foundation for either of them."

The company's capital reduction scheme petition was down for hearing on Monday, Nov. 7, and the proceedings, after occupying several days, before Mr. Justice Eve's court in the Chancery Division, resulted in a verdict in favour of the company, which is thus authorised to write down the £1 issued ordinary shares to ten shillings.

During the proceedings it was stated by Mr. Nordon a solicitor, that the capital in the Television Company was £600,000, and that that company gave Mr. Baird £150,000 for his patents.

The first programme experimentally broadcast by the B.B.C. from Great Britain to its colonies and dependencies took place from the Royal Albert Hall, London, in connexion with the Armistice Day Remembrance Festival.

The transmission was arranged to take place from 8 to 10 p.m., G.m.t., through 5XX for the British Isles and Europe, and through 5SW (the new experimental short-wave transmitter at Chelmsford) for the Dominions and Colonies overseas, which works on 24 metres with a power of 20 kw. The programme was relayed throughout the broadcasting systems of the Dominions, using 5SW as the inter-Continental link.

According to the *Sunday Express*, the following were a few of the registered and representative results of the broadcast which, considering the immense difficulties to be overcome, cannot be called unsatisfactory :—

Ottawa.—The broadcast of the Albert Hall concert was a great success. Transmission arrangements were so excellent that wireless amateurs with only crystal sets were able to follow the programme clearly.

Montreal.—The Albert Hall programme gave great pleasure to listeners in Montreal and district.

Toronto.—"Lead, Kindly Light" and "Abide With Me" were the best heard parts of the programme.

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Cairo.—Thunderstorms interfered somewhat with reception, but many individuals report excellent reception.

Ceylon.—Cheering as the Prince of Wales entered the Albert Hall could be heard plainly, but atmospherics then unfortunately caused interference.

Melbourne.—Listeners were disappointed because the Prince of Wales' speech was inaudible.

Bombay.—Fair to strong signals were re-broadcast by the secretary of the Wireless Club, and speeches could be followed, although fading occurred.

Nairobi (Kenya Colony).—Snatches of the songs were heard and followed eagerly.

The following, however, is a report furnished by the B.B.C. to the *Daily Telegraph* of all three broadcasts:—

"Australia reported a good and clear reception of one of the three broadcasts, namely, the mid-day organ recital, and the message of greeting from the B.B.C. From New Zealand and South Africa there was no definite information, and it may be assumed that reception was unsatisfactory. In Canada there was a very successful re-broadcast of the speech by the Prince of Wales and other items in the evening programme. India did not even hear the carrier wave. Buenos Aires received the Prince's speech clearly, but Lagos reported that speech was received badly and that the music was only passable."

A propos of this subject the Wireless Correspondent of the same journal recently wrote to that newspaper apparently regarding an interview he had obtained with Captain Eckersley on the latter's return from the Radio Conference at Washington, in which the Captain explained that during his visit to America he had been in close touch with Dr. A. N. Goldsmith, of the Radio Corporation of America. He, Captain Eckersley, found that the B.B.C.'s view that radio engineers could not at present give a minimum guarantee of efficiency for an Empire service was entirely supported by Dr. Goldsmith. He had arranged that the B.B.C. should continue the experiments which had been carried on for the past four years with America in transatlantic reception. The Chief Engineer of the B.B.C. also told the *Telegraph* correspondent that he could visualise "the time when a giant station somewhere in the heart of England would direct beam transmissions to South Africa, Canada, India, and Australia. Spaced aerial systems, covering perhaps miles of territory, would pick up these beam broadcasts in all parts of the Dominions for relaying to listeners through the local stations. The beam, he told me, had shown how to a great extent atmospherics could be conquered. Fading, the other great trouble with long-distance reception, was being tackled by the spaced aerial system—a number of receiving stations spread over a given area taking the same broadcast and combining the result."

HOLLAND.—It is reported by *World Radio* that at the annual meeting of the Netherlands Union for Radio Dealers it was stated that in 1923 the total value of wireless sets of all kinds imported into Holland was 250,000 guilders, or about £20,000. The increase in the last few years has been so great that in the first nine months of 1927 the value of the imports was just over six million guilders (£500,000).

It is reported, says *The Electrical Review*, that the new transmitting station at Huizen, which has been built by the Protestant and Catholic Radio Group, was to be inaugurated on Oct. 22. It will use a wavelength of 1,840 metres. It would be interesting to know if they have yet been heard "on the air."

The Philips Co.'s short-wave experimental transmitting station, PCJJ, is being removed from Eindhoven to Hilversum, and, in consequence, the transmissions will be interrupted for about six weeks whilst the transmitter is dismantled and reinstalled at the new station. The last transmission from Eindhoven was to have taken place on Oct. 18. Later advices, however, state that: "Owing to unforeseen circumstances the transference of the Edinhoven short-wave transmitter (PCJJ) to Hilversum has been delayed," but judging from the terms of the communication the transfer should become effective before the end of the present year.

INDIA.—An interesting illustration of the value of wired-wireless in countries where telegraph lines have to pass over rough and exposed country and are liable to develop faults through exposure to strong winds and storms, comes from India and is reported upon by the *Times of India*. The Central Telegraph Office is at Bombay, as our readers are aware, and the "beam" wireless transmitting station at Kirkee, Poona, signals between the two stations being conveyed over the telegraph lines by means of wired-wireless. On Sept. 14, according to the newspaper just mentioned, there was a "very bad breakdown of the trunk telephone between Bombay and Poona, which was not put right till the following morning. While the wires could not be of any service for telephone communication after the breakdown, the 'beam' wireless service, which is also using the Government trunk lines for transmitting messages to Kirkee, experienced no difficulty in putting through hundred of words over the same incapacitated wires. While speech uttered into the telephone mouthpiece could not pass beyond the spot where the break had occurred, *the 'beam' signals jumped over the breach, a very clever adaptation of the latest advances of wireless science to land-line signalling.*"

While there is no doubt that the beam signals could in the circumstances pass over a gap in the broken wires, justice rather demands that the carrier-wave should have the full credit of forming the bridge between the broken ends. May one hasten to add, for the comfort of the sister service, that it was no fault of the telephone signals, as such, that they were unable to get across. For these latter the "bridge" was not available as they had not taken the precaution to travel by that route!

Indian Engineering says that a 250-watt transmitting plant is being erected by the Burma Radio Syndicate which hopes to commence broadcasting before very long.

NEW ZEALAND.—From Wellington Reuter's agency reported that during the 36 hours tests of the English 24-metre station (5SW) reception in New Zealand, at Wellington, was heard from 11.50 p.m. on the Saturday until 2.30 a.m. on Sunday. Until 1 a.m. reception was only on headphones, but afterwards there was fair loud-speaker strength. The broadcast was also clearly heard at Auckland from 4 p.m. (summer time) onwards on Sunday. The gramophone music, organ solo, and announcer's statement regarding the experiments were picked up on 3-valve sets, and came through with remarkable clarity on the loud-speaker, though there was frequently slight fading.

The Church of England authorities in Auckland, alive to the possibilities of broadcasting as a means of disseminating religious teaching, says the London *Daily Mail*, are to establish a station of their own at a heavy cost.

POLAND.—There has recently been held at Warsaw a broadcasting conference, says *World Radio*, with the main object of studying the problem of exchange by landline of the broadcast programmes between the Central European countries, i.e., Poland, Germany, Austria and Czecho-Slovakia. The Conference, which took place in the offices of the Ministry of Posts and lasted three days, was attended by the duly authorised delegates of the respective countries.

The Cracow station's wavelength of 422 metres, it is understood, will be allotted to the new station in Katowitze, and since Oct. 25 it has worked on 500 metres. Katowitze, being a station of 10 kw., had to adopt an exclusive wavelength, while the former could do with a common wave.

According to the Ministry of Posts and Telegraphs, the total number of the listeners registered throughout the country at the end of August was 95,274. A little over 3,000 applications were registered during August, the small number being due to holidays.

The Central Board of Statistics, according to the *Electrical Review*, indicates that "the Polish market consumes 30,000 valves, and about 60,000 lb. of wireless parts per month—all of foreign make. The value of the imported wireless materials amounted this year to nearly £150,000. Two-thirds of this amount covers goods imported from Germany. The above figures, if added to those representing home manufacture, point to their being about 300,000 radio listeners in the country, of whom, so far, only one-third have registered." There is likely to be some hard thinking in the Polish Post Office as a result, is the involuntary comment. Who would deny the value of statistics after this little revelation?

The system will shortly be amplified by the addition of two new transmitters—one in Katowitze, Polish Upper Silesia, and another in Wilno, North-East Poland. The power of the Katowitze station will be 10 kw., and that of Wilno about 5 kw. Thus there will be, says the last-mentioned source of information, five stations, namely, Warsaw, 10 kw.; Cracow, 1.5 kw.; Posen, 1.5 kw.; Katowitze, 10 kw.; and Wilno, about 5 kw. A sixth will be erected in Lvov, South-East Poland, but the chain will not be complete until either the erection of a seventh transmitter somewhere at the Polish sea coast is completed, such as at Gydnia (Polish Baltic port west of Danzig), or by the increase of Posen's 1.5 kw. to 15 kw.

PORTO RICO.—A new direct radio service between the United States and Porto Rico was opened on Oct. 10 by the Radio Corporation of America. The transmitting apparatus at San Juan, P.R., is of the modern short-wave vacuum-valve type, says the *T. & T. Age*, with an average power of 20 kw.

SOUTH AFRICA.—Reuter's Durban correspondent states that Mr. Beardsley, a radio amateur, picked up transmissions during the night of Nov. 1-2 from the new British short-wave station at Chelmsford, 5SW, with which the British Broadcasting Corporation is carrying out experiments, and which will serve as a guide to its future policy with regard to Empire broadcasting. Reception was very clear indeed.

The following items of special interest to readers of these columns are culled from the Annual Financial and Statistical Report on the South African Post Office for the year ending March 31, 1927:—

The general profit and loss account for the Department as a whole shows that on the revenue side cash receipts amounted to £3,495,519, which, with the value for services rendered to the Imperial Government, and Union and Provincial Government Departments, made up a total revenue of £3,661,454. Expenditure amounted to £2,844,538 for cash payments, interest liability on capital £344,758, interest on value of Government buildings £65,197, liability on Pension Funds £207,970, services rendered by other Departments £126,594, and miscellaneous and depreciation £71,771. There was thus a balance of profit of £626. Last year the balance of profit was £303,097, and the reduction to £626 is due principally to the sacrifice of revenue caused by the reversion to inland penny post.

The cash revenue for the year was: Postal, £1,717,588; telegraphs, £474,210; and telephones, £1,183,114, which, with receipts from Government telegraphs and telephones of £120,607, made a total of £3,495,519. The cash expenditure totalled £2,907,671, the chief items being: Salaries, wages and allowances, £1,957,738; conveyance of mails, £474,779; and maintenance

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of telegraphs and telephones, £340,422. These cash figures compare with revenue £1,471,782 and expenditure £1,491,204 in 1911-12 and £3,495,519 and £2,907,671 in 1926-27.

The total number of telegrams was 6,055,679, including 233,326 press telegrams of 30,332,380 words, an increase of 155,000 on the year previous. Cablegrams via the Post Office numbered 263,368, as against 243,150 in 1925-26.

In the Union's Education Departments Technical Examination there were 15 successful candidates for the Preliminary Technical Certificate, out of 53 entries.

For the City and Guild's Examinations 8 passed out of 10 entries for Telephony I, and 14 (one candidate gaining the Silver Medal) out of 21 for Telegraphy, Grade I.

The "teletype" telegraph instrument has been extended during the year to work between Johannesburg and Pietermaritzburg, Johannesburg and Union Buildings, Port Elizabeth and Grahamstown, and Port Elizabeth and Queenstown. The Eastern Telegraph Co. introduced a new apparatus known as a "regenerator," by means of which transmission time between England and South Africa is considerably reduced.

The "carrier current" system is being installed between Johannesburg and Durban, whereby several circuits will be obtained from one pair of wires.

The Service journal of the South African Post, Telegraphs and Telephones gives a very appreciative notice of the British Post Office Secretary's book on "The Post Office" in Great Britain and wonders how with a quarter of a million men and women to look after, Sir Evelyn could manage to find time to compile so huge a mass of material.

SPAIN.—The Spanish Government has annulled by Royal Order the concessions granted to the Radio Iberica Company and Vicente Goyeneche, the owner of "Radio Madrileña," on Oct. 31, 1924, and July 22, 1925, respectively, for broadcasting purposes, on the ground that neither station has broadcast a regular programme since April last, and they have failed, therefore, to comply with the concession. The stations were EAJ6 and EAJ12, and broadcast on 272- and 297-metre wavelengths, says *World Radio*. Thus Madrid is left with only "Union Radio," EAJ7, on 375 metres, and "Radio España" on 400 metres. Radio Iberica will be remembered as the first Spanish broadcasting station.

SWITZERLAND.—Reuter's Berne Agency recently reported that: "In view of the need felt by the League of Nations for the possession of further communication facilities, it is announced that the Board of the Swiss Marconi Company has decided to install a new high-speed radio-telegraph transmitter with an anode power of 50 kilowatts. The range of the installation will be over 3,000 kilometres and the station will be capable, in normal weather, of linking up the headquarters of the League at any moment with any spot in Europe, the Far East, and North Africa. The present transmitters will be reinforced, so that the League will by next summer have at its disposal four high-power transmitting sets, and it will be possible to receive simultaneously from twelve foreign stations. At the same time, the Swiss Marconi Company will have an office permanently open at Geneva from which it will be possible to transmit news directly by wireless telegraphy. The estimated cost of the scheme is 650,000 Swiss francs, which will raise the total expenditure on the Swiss Marconi Company's installations to over 3,000,000 Swiss francs.

U.S.A.—Variations of the transmitter frequency of station WCGU at Sea Gate, Coney Island, U.S.A., are due to the rise and fall of the tides, according to Mr. Richard W. Daniels, chief engineer of the station. Tests with a laboratory oscillator showed, says the *T. & T. Age*, that during ebb tide the wavelength decreased to 210 and a fraction metres and that midway between this and flood tide it decreased from two to four half-kilocycles, thus increasing the wavelength to 214.6 metres, which is more than the wavelength prescribed for the station by the Federal Radio Commission. The aerials of WCGU are 75 ft. from the breakers, which, combined with the fact that the sand, when wet, becomes an excellent conductor of high-frequency current, according to Engineer Daniels, adds capacity to the antenna while reducing its effective height. The operators are obliged constantly to check the wavelength of the station because of this peculiar condition.

Mr. S. W. Goulden, of the Radio Corporation of America, states that a new type of microphone has been tested by WJZ in New York, WGY in Schenectady, and KDKA in Pittsburgh, and proved successful. It is a condenser microphone and is reported to reduce the effect of extraneous noises caused by mechanical vibration at the point where the programme originates.

The gross income for this same Corporation, it may be mentioned, for the quarter ended Sept. 30 was $16,773,091, and the surplus profit was $3,588,989, making the surplus for the first nine months of the year $4,141,355.

The Federal Trade Commission, says the Exchange Agency, will resume its investigation into the alleged monopoly of the principal electric companies and the American Telephone and Telegraph Company and others in New York on Nov. 1.

The companies are charged with the exchange of patents and the results of research and experiments with a view to perpetuating the control of wireless and broadcasting.

The following appears to be one of the side-lines of the American Telephone & Telegraph and the Western Electric Companies of America, who, between them, according to the *Daily Mail*, have installed an artificial larynx which enables him to speak with ease in the throat of Mr. T. Coleman Du Pont, Senator for Delaware, U.S.A. Recently he had an operation involving the removal of his vocal chords, the larynx and part of the tongue and windpipe, but by a device perfected three years ago in the laboratories of the companies mentioned he is still able to talk.

A new system of electrical control has also been demonstrated in New York, by which it is possible for a telephone to turn on electrical machinery at a distance. By this method a housewife, by telephoning her home and using the correct signal, can turn on the electric stove and cook her dinner while she is out shopping.

No telegraphist is likely to envy the lot of a telephonist with this latter contraption as a possible super-position in view. It needs no far flight of imagination to visualise the awful possibilities of a "wrong number" and its sequel, a "wrong dinner" started at a "wrong time"!

The Mackay system, which includes the Postal Telegraph-Commercial Cable Companies, following the decision of the United States Circuit Court of Appeals on Oct. 6, that Dr. Lee De Forest was the original inventor of the radio feed-back circuit and oscillating audion, is to establish short-wave wireless systems across the Pacific Ocean and throughout the United States in about six months; the starting of the land system only awaits the approval of the Federal Radio Commission. The Court of Appeal's decision and the contract held with the Federal Telegraph Co., of California, are accepted by the Mackay Companies as placing them in a position to begin wireless operation without fear of litigation. They will begin the installation of short-wave wireless stations across the Pacific Ocean that will at a "nominal expense," says an American authority, double the capacity of the service to the Orient now provided by cable connecting San Francisco, Honolulu, Midway Islands, Guam, Manila and Shanghai. Radio stations will be erected at all those places and will provide service to Manila by automatic relay; if static interferes with communication between stations in the chain, messages will be relayed by cable. The wireless system will be used to carry deferred, or cheaper, messages, and to supplement the cable at times of heavy traffic.

The Chicago Federation of Labour, which has been experimenting with station WCFL for the past two years, plans a chain of co-operative farmer-labour owned and operated broadcasting stations, says *World Radio*. A representative of WCFL is asking State federations of labour to assess themselves $1 a year per member so that entrance may be made to the radio field on an extensive scale. WCFL is now about to expand and unite with the Iowa Farmers' Union in the erection of a station near Elgin, Ill. The WCFL plant in Chicago cost £40,000, and is now, after a laborious fight, established.

Washington Conference.—The technical sub-committee of the International Radio and Telegraph Conference voted by 10 to 7 to exclude broadcasting from a band between 1,050 and 1,550 metres. Germany, France, Norway, Sweden, Austria, Czecho-Slovakia and the Netherlands strongly opposed the motion, and a subsequent message announced that the sub-committee has reached a compromise whereby all European nations will be permitted for one year to broadcast on wavelengths between 1,550 and 1,340 metres. The sub-committee also adopted an agreement that, notwithstanding the adoption of wavelength band restriction, certain services of each nation shall be privileged to use any wavelength for any purpose so long as such use does not interfere with another service authorised by the allocation agreed upon.

According to the *Daily Telegraph*, it adopted an agreement allocating adopted wavelengths applicable in the future, but does not propose prohibiting or abolishing existing stations. Each nation is to conform to the new allocations as soon as practicable. Great Britain, desiring to keep her bands free for aviation services, voted with the United States, but favoured reservations for European broadcasting on a 1-550- to 1,875-metre band. The delegates of the principal nations at the Conference have agreed to frame the proposed Radio Convention in two sections, one to be signed by nations like the United States, with private communication systems, and the other by nations with Governmental communications. Thus, says the Exchange Telegraph Company, the United States private wireless companies escape international regulation, a point upon which there has been controversy since the Conference opened. The general regulations to which the United States adhere include rules for preventing interference, allocating frequencies and promoting uniformity in mobile services, both for ships and aircraft.

What is described at Washington as an American victory was the recommendation of the Mobile Service Sub-Committee of the Conference that spark radio sets be eliminated from use in ships by 1940. Mr. White, an American delegate, discussing the number of votes to be allowed to each country, advocated one vote for each independent governing nation. This proposal, it was stated, would include the Irish Free State, Canada, Australia, New Zealand, and probably South Africa among the independent nations, but would exclude British India and the Philippines. The proposal, if ratified, would eliminate the suggestion of a British delegate that the vote be "by administration," which it was estimated would give no fewer than 60 votes to the British Empire. Another proposal by a Chinese delegate was

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that the vote be according to the volume of traffic, but that was opposed by the Americans on the ground that its enforcement would involve too much technical research.

Later: Reuter states that satisfactory progress was reported in the discussion on the allocation of short wavelengths to various radio services.

An understanding is also reported to have been reached on the allocation of votes to various nations. It is understood that the United States, France, Italy, Japan and Germany would have six votes each and Great Britain eight. This understanding is expected to arouse opposition from some of the smaller Powers, particularly those in South America, which would be allowed only one vote each, despite the fact that they sought larger influence in voting, on the ground of the size of their territories.

It is worthy of note that the interests of the amateur—that very useful individual who has proved so helpful to the development of the use of short-waves—were represented at Washington by Mr. Hiram Maxim. Mr. Maxim is a relation of the famous gun inventor, adds the wireless correspondent of the *Daily Telegraph*, and goes on to say that the opinion in certain quarters at the time of going to press was that a band between 0 and 20 metres might be allotted to the amateurs of the world as there is "much to be investigated in the ultra-short wave region. Mr. Gerald Marcuse, of 2NM, Caterham, whose name has become famous in radio circles, is not, therefore, likely to be compelled to "go out of business."

The American delegation to the Conference set a precedent on Nov. 11 by agreeing at a plenary meeting of the Convention Committee to the inclusion of an unconditional and compulsory arbitration clause in an international treaty binding upon the United States. The delegation voted for compulsory arbitration for the settlement of any international dispute arising from the Convention.

As these lines go off to the impatient "Comp.," we hear by wireless and otherwise that most, if not all, of the various British delegates are homeward-bound.

A meeting of the Institute of Wireless Technology was held at the Engineer's Club, London, on the 8th ult., when Messrs. W. B. Medlam, B.Sc., A.M.I.E.E., and U. A. Oschwald, B.A., presented a paper entitled "A Note on the Performance of Valve Detectors."

The directors of the National Telewriter Co., Ltd., have decided to pay a dividend of 1% on the Preferred ordinary shares.

The City Editor of the *Electrical Review* continues to remark on the "mysterious rise in Great Northern Telegraphs," which apparently "is still the outstanding feature amongst cable stocks and shares. . . ." He comments that Copenhagen professes to be as much in the dark as is London, and cannot account for the movement, and that hints abound as to the buying being for purposes of control.

On the other hand, the same commentator remarks that the Eastern Telegraph group is a heavy holder of this stock, being "manifestly uneasy at the possibilities of wireless competition."

In the cable manufacturing industry in Germany this same note of uncertainty may be heard here and there. For example, Herr G. Zapf, writing in a Cologne newspaper, states that while the home market is at present very well occupied, in the case of submarine cable manufacture, this branch is at present in a state of stagnation owing to the paralysis of the German marine cable policy caused by the war *and* through the conflict of opinion as between cables and radio-telegraphy.

The issue of Nov. 11 of the *Electrical Review* contained an excellent photograph of Lt.-Colonel A. G. Lee, O.B.E., M.C., &c., &c, the distinguished Staff-Engineer-in-Charge of the Radio Section of the G.P.O. Engineering Department.

The *Review* reminds us that the original of the photograph entered the Engineering Department in 1901, serving during the war with the Signal Section of the Royal Engineers, being mentioned in despatches and gaining the M.C. He is at present Lieut.-Colonel, Royal Corps of Signals (Supplementary Reserve). Lt.-Col. Lee received the O.B.E. in June, 1927, for work in connexion with transatlantic telephony. He received the Duddell Premium, 1924-5, for joint authorship of a paper on the Leafield coupled arc. He was British delegate to the Inter-Allied Radio Conference in Paris in 1921. His other activities include membership of various committees of B.E.S.A., B.E.A.I.R.A., and the Radio Research Board. Of the "Atmospherics" Committee of the last-named he is chairman.

The occasion of this biography was the announcement of the delivery of his address before the I. of E.E., the Wireless Section of which he is chairman. The *Electrical Review* has since published a lengthy *résumé* of the address on "Radio Atmospherics" in their issue of Nov. 25.

It is satisfactory to know that the Chloride Electrical Storage Co., Ltd., are taking very special steps to deal with the matter of lead poisoning in connexion with accumulator manufacture the dangers of which are, perhaps, not fully realised by the outside public. The company in question have appointed Dr. R. E. Lane, M.R.C.P., to make a complete study of the disease. The doctor is to devote the whole of his time to the matter.

It is gathered from the terms of the announcement that the results of Dr. Lane's investigations will be made known to the whole of the industry.

I may perhaps be permitted to strike a personal note in expressing my intense satisfaction that the Engineering Department of the G.P.O. has caused a Cook governor (designed by Mr. F. Cook, Overseer, Cable Room, C.T.O) to be made at the Holloway factory, and also to learn that one has been issued for use on a Baudot set working between London and the Continent. The writer was favoured by the inventor with a first sight of this simplified form some twelve months and more ago, and I should be surprised, indeed, if the further prolonged trials did not materialise with a unanimous verdict in its favour. Mr. Cook first worked out his invention mathematically and then made his model accordingly—"with odd bits from his motor-bike," was the comment of his friends—nevertheless, even this first rough effort was successfully proved out.

Writing of inventions, I hear now and again privately of the progress made by the Karolus Siemens apparatus for the transmission of photographs, and the conviction is apparently gaining ground in Germany that there is a widening field for its exploitation in the Radio services.

From the same source the opinion is also expressed that there is much to be done in the way of improving the printing telegraph apparatus for line telegraphy and that this form of apparatus is likely to be standard for a long time to come.

It is with sincerest regret that the death is recorded of Mr. H. W. S. Rentell, A.M.I.E.E., F.Z.S., for over thirty years editor and manager of *Electricity* and managing director of S. Rentell & Co., Ltd., London.

The following promotions in the C.T.O.: to Asst. Superintendent, Messrs. W. G. Godden and E. F. Bing; and to Overseer, Messrs. H. Potter and C. H. Allaway; were duly announced as from an early date in October, and due congratulations are tendered accordingly.

Mr. William Davis, in the Oct. 15 issue of *Supervising*, has written an appreciation of Mr. Charles H. Garland—who has just retired from the Civil Service—with which no one is likely to quarrel, certainly not the esteemed subject of that appreciation. The career of C. H. G., commencing as a C.T.O. telegraphist and terminating his Government service as chief of a Department of the Ministry of Health at Darlington, being decorated in 1926 with the I.S.O., is certainly as unique a record as was his work for the P.O. Sanatorium and that as chairman of the National Sanatorium Association.

Parliament—On Nov. 8, Sir F. Wise asked the Postmaster-General if he would state the number of wireless telephony calls between England and the United States and *vice versa*.

Sir W. MITCHELL-THOMSON said that the figures up to Nov. 6 were as follows: Calls from Great Britain 830, calls from United States 991.

Post Office Relief Fund.—At the October meeting of the C.T.O. Branch the Committee considered reports on scholars benefitting under the Fund. The Committee noted the success of one of the girls who had passed the Matriculation Examination with Honours, obtaining five distinctions and special credit in Oral French. In the Clerical Examination she took the 97th place out of 150 successful candidates and 504 qualified candidates, and has since taken up duty in the Savings Bank Department. Such successes are particularly gratifying to the Committee, and afford striking evidence of the valuable work achieved through the agency of the Fund.

An Abuse of Science.—The invention of a microphone which can be hidden in a vase of flowers and will make lovers' whispers audible outside the conservatory or in the next room is an abuse of science !—The *Frankfurter Zeitung*.

J. J. T.

THE TELEPHONE AND ILLITERATES.

WHEN reporting upon postal and telegraph communication on the Gold Coast, Mr. Ormsby-Gore, Parliamentary Under-Secretary for the Colonies, drew special attention to the fact that one of the advantages of the telephone was that it could be used by illiterates, and on the Gold Coast, where so much wealth is in the hands of illiterate cocoa farmers, its use naturally appeals to them. He was told that in certain cases they had even been willing to guarantee sums up to £120 per annum to cover the usual rental fees in order to get the service. This factor is worthy of the most careful consideration by those firms that are desirous of endeavouring to foster trade abroad.

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THE BIRTH OF HOLBORN AUTOMATIC EXCHANGE.

How often has imagination been fired by the story of some sweet, demure maiden sitting in a daisy-decked dell pulling apart the petals of the most perfect specimen she can find, reciting to herself the while with tremulous lips—"He loves me—he loves me not—he loves me!" In like fashion many a romancer of the telephone service was murmuring in hushed tones in the early days of November, "Holborn opens—Holborn opens not—Holborn opens!" The wheel of chance having been skilfully adapted and controlled to operate as a dial granted the magic message: "011,121,2," which, being automatically translated by a director, read, "Holborn opens in the eleventh month at twelve on the twelfth." So far, so good. It was a happy chance that housed London's first automatic exchange in the same building as "Tandem," which, had its naming had the skilful attention lavished on some other exchanges, would surely have been known as "Autolycus"—"the snapper up of unconsidered trifles," for if one ignores the suggestion of the last two syllables it answers well the description of an "Auto-Toll" snapping up and correctly routing the trifles of traffic which do not justify direct circuits. This by way of digression.

Surely Nov. 12 was a veritably inspired date. Had not the octave begun with the pyrotechnic display of the 5th, to be followed by the pageantry of the 9th, succeeded in turn by the solemnity of the 11th and the gaiety of the 12th, whilst the very hour of midnight had a singular appropriateness, for was it not the time at which, under a ruling of the Portland Club, the "valued call" ceased to operate, and "majority calling" was restored to its pride of place—truly prophetic and fully realised on Monday the 14th.

For one very closely interested in the "birth of London's first automatic exchange," it must be reckoned a trifle disconcerting to reach the exchange in a taxi, the dial of which records one sum in order to obtain another. On the other hand, what could be more heartening than to reach the goal quickly and correctly via SEVENDIALS—a happy omen and one which to those who are superstitious (and who is not) would fully justify the new system for London.

Arriving at the building itself one was immediately struck with the atmosphere of complete orderliness and repose as in a house prepared for some very special occasion. The floor of the apparatus room shone as brightly as the faces of the baby's parents—the A.T.M. staff and the P.O. Engineers—whilst the expectant nurses—the Traffic staff—stood ready to minister to the child's wants when its cries became audible. It might have been a "royal" infant, so numerous were the courtiers and press representatives gathered to greet its arrival; and with what intense satisfaction did the news circulate just prior to midnight—"It lives; 'tis a bonny baby," whilst the quoter of apt sayings reminded us that "Saturday's child works hard for its living." There is always a pessimist present on such occasions, and one was heard to repeat Lord North's comment, "They are ringing the bells now; they'll be wringing their hands soon,"—but his remarks were drowned in the showers of congratulations from the general body.

"Let us test our first choices," sounded almost as a chorus in the early hours of the morning, but, possibly owing to the fact that a delegation from Liverpool was staying at an hotel near by, "first choices" came to be confused with "First Avenues."

The child is certainly beautiful to behold and has already developed individuality of its own. It slept peacefully enough all through Sunday, was a little restless on Monday and Tuesday, when rather too many folk were anxious to test its reaction to stimuli, a process that can be overdone, but by Wednesday it was reproducing with really remarkable accuracy long sequences of letters and figures when these were communicated to it slowly and deliberately, as is the proper way when addressing young children. An only child, we are told, lacks much and pines for the company of other children. It is the same with this baby, and there is no doubt that it will go from strength to strength as it gets the benefits of association with its cousins—Bishopsgate, Sloane, Western, and the other members of an ever-growing family.

H. D.

THE WASHINGTON CONFERENCE (II).

THE Washington Radiotelegraph Conference is making as rapid progress as could reasonably be expected of a body representing practically all the countries of the world and comprising more than 400 delegates. It divided itself up into a number of committees: each committee set up sub-committees. Only by this process of diminishing the number of members could conclusions be reached. Unfortunately, however, each decision has to trickle back through a sub-committee, full committee, and a drafting committee before it is finally approved by the full Conference. Hence, while there is much activity and much clanking of official machinery, the final output per day or even per week is somewhat meagre.

There have been few exciting moments. One occurred when the President, Mr. Hoover, asked whether the Conference would be willing, as an act of international friendship, to allow Germany to exercise six votes, although, having lost all her colonies, the number to which she was entitled should have been reduced from six to one. It was made clear that the concession would be limited to the present Conference, and that if any delegation objected the proposal would fall. After a tense silence of about a minute's duration Mr. Hoover declared the motion carried.

One of the committees had to consider the conditions under which amateurs should be allowed to operate experimental transmitting stations and what kind of messages they should be allowed to exchange with amateurs in other countries. There are some 17,000 amateur stations in the United States; and a representative of this powerful body made a long statement from which one gathered that the wireless amateur is the salt of the earth, that he alone is responsible for all the progress made in the wireless art and that his activities are more important than those of the League of Nations in fostering international friendship and binding nation to nation. After a good deal of discussion regulations were made which appeared to be satisfactory to all parties.

Proposals had been made that the question of the counting of code words which had been left over by the Paris Conference, should be dealt with at Washington; but it was decided that a Radiotelegraph Conference would not be competent to deal with this question and could not properly set up a special Telegraph Conference at Washington to deal with it. The present rules of counting will accordingly remain unchanged.

Many alterations have been made in the radiotelegraph regulations; and important decisions have been taken in regard to the allocation of wavelengths to broadcasting and other classes of wireless services.

F. W. P.

DOUBLE X.

THE Foreman passed a "service call" from a public telephone to his Inspector on the question of the use of certain poles. These are described as "lights," "mediums" and "stouts," without the use of the word pole.

Foreman: "There are two double Xs. on them, and 3 Stouts with 3 Xs, and we want the stouts."

Voice of Lady interrupting: "You said this was an official call and you are talking about beer all the time."

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REDUCED TELEPHONE CHARGES FOR ANGLO-CONTINENTAL CALLS.

ON Dec. 1 considerable reductions were made in the charges for calls between Great Britain and the Netherlands, Germany, Danzig, Sweden, Norway, and Denmark. As examples we give the day charges between London and—

	New.	Old.		New.	Old.
Amsterdam ...	8/-	10/-	Gothenburg ...	17/3	21/6
Berlin	12/-	16/-	The Hague ...	8/-	10/-
Breslau	14/-	18/-	Hamburg ...	11/3	15/-
Cologne	9/9	13/6	Königsberg ...	15/3	20/-
Copenhagen ...	14/9	18/6	Leipzig	12/-	16/-
Danzig	14/6	19/-	Munich	12/6	16/6
Dresden	12/6	16/6	Oslo	18/6	22/6
Düsseldorf ...	9/3	12/6	Rotterdam ...	8/-	10/-
Frankfort-on-Main	10/6	14/-	Stockholm ...	17/3	21/6

The night charges are roughly three-fifths of the above. On the same date the Anglo-Swedish service was extended to cover the whole of Sweden, and the London—Oslo (Norway) and the London and Copenhagen (Denmark) services extended to cover the whole of Great Britain.

A day call from London to Gellivare (2,300 miles distant) in the Arctic circle costs £1.

THE G.P.O. PLAYERS DRAMATIC SOCIETY IN "R.U.R."

THE G.P.O. Players Dramatic Society are nothing if not enterprising, and are decidedly catholic in their taste. On Oct. 28 and 29, at King George's Hall, they gave their supporters an opportunity of seeing Karel Capek's much-talked-of "Robot" play. This drama, which has the distinction of having added a new word to the language, deals with a solution of the labour problem by a method fraught with tragic consequences. The R.U.R. (or at least its General Manager, played by Mr. Jack Scott) cherishes at one time high ideals. Drudgery is to be abolished, the cost of production of every kind of commodity is to be reduced, and a golden future for humanity is anticipated. But the demands of shareholders for dividends leads to the production of robots in countless quantities. They are much sought after as soldiers by "patriotic" war ministers, and soon the earth is plagued by vast, efficient and unfeeling masses of instruments of slaughter. In all this there is an allegory which is not difficult to read. Ultimately, as the methods of manufacture improve, the robots are endowed with feeling, and soon learn to turn upon the human beings who exploit them, until, as a result, humanity ceases to exist. Mr. Jack Scott, who sustained the heavy part of the General Manager of the company, came off with flying colours in this exacting rôle. Mr. John Cahill (Clerk of Works), the only human being left alive after the revolt, found a part well suited to his finished technique. The staff of the R.U.R. were a triumph of stagecraft. Dr. Gall (Mr. Alfred Doust), Dr. Helman (Mr. Gerald Storr), Fabry (Mr. Eric Hudson) and Berman (Mr. Cyril Leigh), each looked and acted their rôles to the life. Miss Kathleen Emery, as Helena, moving in an atmosphere at first uncanny and afterwards tragic, played this sympathetic character with great effect. Miss Cowan, as the maid, brought a welcome touch of comedy into a play depicting little of the lighter side of life. All the Robots were good, Miss Joan Barrett and Mr. Pilkington successfully enacting a scene indicating the dawn of love and the promise of the perpetuation of race of Robots by the process of nature, which might easily have raised a titter if unskilfully handled. The play was produced by Mr. H. Hodgson Bentley with the care and competence which we have come to expect of him. He received quite an ovation at the end.

W. H. G.

PROGRESS OF THE TELEPHONE SYSTEM.

THE total number of telephone stations in the Post Office system at Sept. 30, 1927, was 1,566,960. The new stations added during September numbered 17,713, and the cessations 8,142, resulting in a net increase of 9,571 stations.

The following table shows the number of stations working at Sept. 30 last in London, England and Wales (excluding London), Scotland, and Northern Ireland :—

	No. of Stations at Sept. 30, 1927.
London	553,264
England and Wales (excluding London) ...	849,745
Scotland	144,037
Northern Ireland	19,914

The growth for the month is summarised below :—

	London.	Provinces.
Telephone Stations—		
Total at Sept. 30	553,264	1,013,696
Net increase for month	3,482	6,089
Residence Rate Subscribers—		
Total	122,765	198,954
Net increase	1,285	2,067
Call Office Stations—		
Total	4,956	18,004
Net Increase	25	124
Kiosks—		
Total	653	3,118
Net increase	30	83
Rural Party Line Stations—		
Total	--	10,088
Net increase	--	36
Rural Railway Stations connected with Exchange System—		
Total	--	817
Net increase	—	11

The number of inland trunk calls dealt with during August (the latest statistics available) was 8,518,656—an increase of 1,023,560, or 13.7% compared with August of last year.

Calls made to the Continent during August numbered 24,503, and from the Continent 26,574, representing increases of 16.5% and 12.8% respectively over August, 1926.

Further progress was made during the month of October with the development of the local exchange system. New exchanges opened included the following :—

PROVINCES—Fforestfach, Wakefield, and Sandal (Wakefield) (all automatics),

and among the more important exchanges extended were :—

LONDON—Chiswick, Ealing, Ilford, Ravensbourne (Bromley), and Sydenham.

PROVINCES—Altrincham, Beeston, Berwick-on-Tweed, Brighouse, Brentwood, Castleford, Crosby, Eccles, King's Norton, Minehead, Newport (I. of Wight), Northwich, and Workington.

During the month the following additions to the main underground system were completed and brought into use :—

Newbridge—Hengoed.
Risca—Newbridge.
Newport—Cross-Keys,

while 70 new overhead trunk circuits were completed, and 94 additional circuits were provided by means of spare wires in underground cables.

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Where Strowger Auto

The Transn

Below is shown one of ***the transmission*** *testing rooms in the* ***Automatic Electric*** *Research Laboratory,* ***where expert physicists*** *are constantly at* ***work in the effort*** *for still further* ***improvement in Strowger*** *transmission apparatus.*

STROWGE

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on Laboratory.

IN the development of Strowger Automatic Telephone Equipment, the importance of efficient voice transmission has been kept continually in mind. Changes in switching methods that might adversely affect transmission have never been permitted to enter into Strowger Automatic design. The result is that the whole Strowger Automatic transmission circuit in use to-day is remarkable for its simplicity and effectiveness.

The development of transmission equipment to work in harmony with automatic switches, and yet be free of all switching equipment and unnecessary "bridges" once a connection is established, has required years of painstaking experimentation and research.

Automatic Electric Inc.

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TOMATIC

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The
Telegraph and Telephone Journal.

PUBLISHED MONTHLY IN THE INTERESTS OF THE TELEGRAPH AND TELEPHONE SERVICE, UNDER THE PATRONAGE OF THE POSTMASTER-GENERAL.

Editing and Organising Committee - - - J. STUART JONES. W. D. SHARP. J. F. STIRLING. W. A. VALENTINE. J. W. WISSENDEN.

Managing Editor - - - W. H. GUNSTON.

NOTICES.

As the object of the JOURNAL *is the interchange of information on all subjects affecting the Telegraph and Telephone Service, the Managing Editor will be glad to consider contributions, and all communications together with photographs, diagrams, or other illustrations, should be addressed to him at the G.P.O. North, London, E.C.*1. *The Managing Editor will not be responsible for any manuscripts which he finds himself unable to use, but he will take the utmost care to return such manuscripts as promptly as possible. Photographs illustrating accepted articles will be returned if desired.*

VOL. XIV. DECEMBER, 1927. No. 153.

"AUTOMATICS."

WITH the opening for public service of the Holborn automatic exchange, the first step in the conversion of the London telephone system to automatic working is definitely surmounted. We are glad that an automatic exchange is actually working in London, if only for one reason. It will convince the man in the street and the more casual kind of journalist that the administration has really embarked on the introduction of "automatic" working into this country. Like Berlin, like New York, like several other capital cities, London is in process of conversion to that system of telephony, and like them is in the early stages of the process, though not so far advanced as the American city. Few if any of the largest urban telephone systems in the world are yet wholly converted to automatic working, although in some of the great provincial towns both here and on the Continent and in America, the change over is complete.

The traveller returning from abroad, having found an automatic service working in Nice, or Orleans, or Munich, or Zurich, or some place in Australia or New Zealand, forthwith writes to the papers saying "They have the automatic telephone in France (or Germany, or Jerusalem). I used it myself in Bopfingen (or Fontenay-aux-Roses, or Wagga-Wagga, as the case may be). Why does England lag behind? What are the authorities doing?" He is seemingly not aware that there are important and flourishing automatic systems working in Edinburgh, Leeds, Sheffield, Portsmouth, Southampton, Blackburn, Stockport, Dundee, Paisley, the Hartlepools, Grimsby, Darlington, York, Oxford, Ipswich, Coventry, Gloucester, Halifax, and in fact in upwards of 60 towns and cities, some of whose exchange systems were converted to automatic working before the War. He seems to think that they "have automatic telephones" in France, if they have them in Orleans, but that we cannot be said to "have automatics" unless we have them in London. And yet this Administration, like all others, gave the automatic system its first trials on small and then on fair-sized provincial exchange systems, before proceeding to the conversion of its capital city. The period of trial is long past, and the gigantic work of converting London's vast and complicated network which will take 15 years to complete is pushing steadily forward.

HIC ET UBIQUE.

As we go to press we learn that the Anglo-Austrian telephone service will be opened for communication between London and Vienna on Dec. 1. The charge for a three-minutes' call by day will be 14*s*. 9*d*. This is the eighth Overseas service to be opened during the year. The extension of the Swedish service to all parts of Sweden and Great Britain, and the considerable reductions in the charges for calls to Germany, Holland and Scandinavia, we deal with in another column.

How quickly did Chappés optical telegraph operate? According to *Telegraphen-Praxis* of Lubeck, this question is answered by Ennemon Gonon in his description of optical day and night telegraphs as follows: "Look at the *Moniteur* of 1841, there you will find that a telegram of 43 words left Calais on Aug. 30 and only reached Paris on the 31st. (The mail coach went twice as fast.) On July 17 a telegram of 36 words was sent from Bayonne and only reached Paris on the 18th in the evening. A telegram of Dec. 27 from Toulon was received in Paris on Jan. 2; it comprised only 57 words. In the year 1843 51 telegrams out of 99 required 2, 3, 4, and even 6 days for their journey.

On Sept. 29 telephone service was inaugurated between the United States and Mexico. The trunk line between Washington and Mexico City via Harrisburg, Pittsburg, Cleveland, Toledo, Chicago, St. Louis, Dallas, and Laredo (Texas) is 3,357 miles long, 2,348 miles from New York to Laredo, and 786 from the latter point to Mexico City. The charge for a call from New York to Mexico (3,134 miles) is $13.55—about £2 16*s*. The charge for a call for London to Stockholm (1,547 miles, or nearly half the distance between New York and Mexico) is 17*s*. 3*d*., whilst between London and Königsberg (about 1,230 miles) the charge is 15*s*. 3*d*.

As the result of a circular from the Mid-German Broadcasting Company, says *Telegraphen Praxis*, asking listeners-in to vote for a programme of music for a "By-desire" night, the following items came first in order of popularity: (1) Selections from Tannhäuser; (2) Blue Danube waltz; (3) Overture to "Poet and Peasant"; (4) Selection from "Tales of Hoffmann"; (5) from "Fledermaus"; (6) from "Carmen"; (7) from "Mignon,"; (8) Wienerwald waltz; (9) Selection from Weber's "Freischütz"; (10) "Peer Gynt" suite; (11) Selection from "Cavalleria

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Rusticana"; (12) Schubert's "Unfinished." This interesting result would seem to indicate that popular taste is similar in all countries. All the foregoing pieces might be heard on a good seaside band.

A correspondent sends us a cutting from a Manchester newspaper which seems to give tidings of an "Automobile 'Phone Scheme." He wondered at first whether the paragraph was prophetic of the days when motorists would have wireless telephone equipment in their cars and be independent of the services of the exchange; but further study of the paragraph showed that only an ordinary automatic scheme was referred to.

The report of the Postmaster-General of New Zealand for 1926-7 contains the information that an inter-island telephone cable was laid during 1926 affording communication between Wellington in the North Island and Nelson, Blenheim, and other places in South Island. When the repeater equipment is completed it is expected that not only Wellington but places as far north as Napier and Auckland will be able to communicate with Christchurch in South Island.

The number of telephones in New Zealand increased from 130,186 on Mar. 31, 1926, to 137,307 in Mar., 1927. Of these 45,364 are working automatic.

A writer in the *Daily Sketch* says: "It sounds comical to hear this week of Londoners learning to dial. In Nice I rang up friends and business offices by dialling in the winter of 1923-4." That was really very clever of him; but (if he was born at the time) he could have rung up subscribers by dialling at Epsom in 1912, not to mention that there were automatic exchanges in Darlington in 1914, Portsmouth in 1916, Leeds in 1918, Dundee early in 1924, and in fact some 20 British towns by the date he mentions.

The United River Plate Telephone Company had, in 1926, 310 exchanges, 136,044 subscribers and 719,700 kilometres of lines. Indicative of the further demand of Buenos Aires and the Argentine provinces for additional telephone communications is the estimate of the Company that £20,000,000 will be required to be invested in the Company's plant during the next 10 years in order properly to cater for development. Long distance lines have been installed during the past two years to Santa Fe (481 kilometres) Tres Arroyos (507 kilometres) and Cordoba (750 kilometres) and the inauguration is expected shortly of the Buenos Aires—Bahia Blanca line, which will establish the record for long distance telephony in South America, namely, 1,600 kilometres. The automatic system is successfully installed in Cordoba and Rosario, while in Buenos Aires five automatic exchanges are already equipped and a further seven will shortly be opened.

We have received a very useful booklet, published by the Society of Motor Manufacturers & Traders, containing a mass of statistics invaluable to motorists. There is one feature about motoring statistics which always interests us and that is the comparison offered by the growth of motor vehicles and the growth of telephone stations. The total number of the former in 1926 was 1,694,000 and of the latter 1,511,000. Two years ago the numbers of each were approximately equal.

The Annual Report of the Postal & Telegraph Department of the Straits Settlements shows that the number of telegrams dealt with increased by 103,684, from 1,008,882 in 1925 to 1,112,566 in 1926. There were in the latter year 1,504 telephones working in Malacca and 683 in Penang. 3,131 wireless messages were despatched and received by the Penaga and Payu Lebar Wireless Stations.

We learn from the Annual Report of the South African Post Office that during the year telephone trunk communication was established between Cape Town and the Cape Peninsular and Kimberley, Johannesburg and Reef, Pretoria and Bloemfontein, there being an average of 89 long-distance calls per week since the opening of the service. During the busiest week 197 calls were originated.

According to Reuter, a telephone service between Berlin and Moscow, via Warsaw, will be opened to the public shortly. Three minutes' conversation will cost 11 marks (about 11*s*.).

An agreement has been signed, says Reuter, between the Post and Telegraph Departments of Poland and Russia with regard to the establishment of telephone communication between the two countries. For the moment four lines only will be opened, namely, Warsaw-Moscow, Warsaw-Minsk, Moscow-Baranowitche and Baranowitche-Minsk. Further lines will be established as required, and those projected will be reserved for local conversations on the same terms as international conversations, between the hours of 10 a.m. and noon and 14 and 15 o'clock; at the other times, international conversations will enjoy priority in accordance with the International Telegraph Regulations. The fees for an ordinary conversation of three minutes between Warsaw and Moscow will be 9.60 gold francs. The agreement provides for communication between Berlin and Moscow via Poland.

We wish all our readers both at home and abroad a Happy Christmas and a Very Prosperous New Year.

DEATH OF MR. SIDNEY RENTELL.

WE deeply regret to record the death of the Editor of *Electricity*, Mr. Henry William Sidney Rentell. Born in 1864, he was educated at the Philological School, Marylebone, and at Neuenheim College, Heidelberg. On his return to England he completed his studies at the Finsbury Technical College. He joined the staff of Woodhouse & Rawson in 1885, and worked there until 1894. In 1894 he acquired control of *Electricity*, which he so successfully conducted for a period of over 30 years, and published various technical books, many of which have become official standards for class teachers and students of electrical engineering. Another publication he founded is the *Practical Electrician's Pocket Book and Diary*, which he started in 1899 and which has proved a very useful annual. His loss will be much felt by the electrical industry.

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FIFTY YEARS WITH TELEPHONE PIONEERS.*

BY T. A. PROUT

(*Continued from p.* 45.)

I WISH now to speak of a quintet of telephone executants, two of whom are still with us and resident in London. I ought to have included Col. C. B. Clay and Mr. Alfred Coleman, whom I am glad to see present to-night, and have thus formed a septet. In 1892 a comet appeared suddenly in the British telephone constellation. I was at Bristol at the time, and the comet was in the shape of Mr. W. E. L. Gaine, a solicitor acting as Town Clerk of Blackburn. His name was unknown to the bevy of stars then twinkling in the telephone heavens, but our astonishment at his assumption of the post of General Manager of the National Telephone Company was increased by the fact that no one pretended that Mr. Gaine was an electrician, an engineer or even a financier, but he was a brilliant genius and quickly enthroned as the telephone king of this country who never tasted defeat during the 15 years of his reign up to his untimely death in June, 1907.

Innumerable delicious stories centre round this fine man whenever old National staff foregather. He had a kind heart and was too big a man to do anything small and mean.

On the walls of rooms occupied by many ex National men there still hangs a copy of a painting of this inspiring telephone leader at work, by Mr. Audley Gunston, the brother of the indefatigable Editor of the *Telegraph and Telephone Journal.*

I think, by the way, that our Journal has something to complain of, in that it is not sufficiently supported by telegraph and telephone men and women. I take it still, and hope to maintain my subscription as long as I am able, as I would not willingly miss its contents from month to month.

Acting with Mr. Gaine in so many great enterprises was Mr. Frank Gill, the ever-popular Engineer-in-Chief of the National Telephone Co., during eight momentous years—1903-1911. If his occupancy of that position is not sufficient warrant for inclusion in the quintet there is his present great position of European Chief Engineer of the International Standard Electric Corporation of Connaught House, Aldwych, with its world-wide ramifications of electrical communication work.

A few minutes later we shall have the opportunity of seeing a set of slides illustrating a really fine romantic piece of pioneer telephone work, just carried out by Mr. Gill in Spain.

No excuse is needed for including the late Sir Andrew Ogilvie with telephone pioneers. I saw enough during the 15 years I was in the telephone branch of the Secretary's Office to know how diligently and thoroughly he prepared affairs and himself for the great merge which took place in January, 1912. He created the numerous Telegraph and Telephone Advisory Committees and in many different ways carried the good-will of the public with the Post Office in the many and necessarily difficult changes of rates and forms of administration incident to the full State control of telephones. Sir Andrew was singularly attractive to those who came into contact with him, of whatever grade, and were without his large experience of organisation and economics. During the war he worked like a Trojan, and the premature decease of this most courtly gentleman in 1924 was mourned by telephone men and women who had had the privilege of knowing him irrespective of whether they were "pre-transfer staff" or not.

I was glad to read in the August issue of the *T. and T. Journal* a contribution, under the well-known initials 'F. H. S. G.," containing a frank acknowledgment of the great experience in the telephone business of my old chief, Mr. R. A. Dalzell, the Director of Telegraphs and Telephones, and speaking of the rapidity and soundness of his decisions given without any parade of the unique knowledge he possessed which enabled him to move with such impressive ease amidst the intricate details of telephone administration. We wish Mr. Dalzell now a complete restoration to health, when his fruitful mind will not cease to ponder over telephone problems.

No one who has spent many years in the telephone business can fail to be familiar with the name of Sir Wm. Preece. He went over to the United States in the eventful year of 1877, and on his return he reported favourably on the newly invented telephone and paid a visit to the first English telephone exchange in Coleman Street in 1879, when there were only 52 subscribers in this great City. Many telephone men were nurtured on his Manuals of Telephony and looked forward to his frequent addresses to the Engineering and Technical Societies of the time.

* Paper read before the London Telephone and Telegraph Society

Assembled in London, we ought to take a glance at the Metropolitan area, with its 550,000 telephones, which represent 7.5 telephones per hundred of the population. As London telephone users originate 10,000,000 calls per week this is no small business. Blucher, on coming to London, exclaimed "What a city to sack!" We may well say "What a city to telephone!"

London, with its 600 street kiosks, of which many are of highly attractive design and illuminated by night, is in this respect in advance of even the United States and Canada, where such kiosks giving continuous service are still unknown.

If, Mr. Chairman, America presses us too hardly on the poor share they suggest that we make in the proportion of telephones to the human population, I suggest we might reply that we can in London claim one telephone per horse. Can they approach us on the equine unit? And we are moving faster than ever before with development generally.

The administration of the vast London telephone system now being gradually put on the director automatic system is under the charge of our friend, Mr. W. A. Valentine, who is a general favourite with everyone he meets, and the interests of the L.T S. are safe in his hands we know very well.

Time being limited, I will divide my 50 years into five decades and look on the progress made in these periods. During the first ten years from 1877-1886, we put in telephones at an average rate of 3,500 per annum. In the next ten years, 1887-1896, in the course of which the Post Office persuaded the Company to sell them their Trunks on an undertaking by the then Postmaster-General that there should be no general competition with the Company but co-operation with it, the net additions made went up to 9,000 per annum. The following ten years, 1897-1906, included a period of fierce opposition to the National Company by Mr. Hanbury, the Financial Secretary to the Treasury and the first municipal competition in Glasgow, but the rate of growth was increased to 35,000 a year and during the next ten years, 1907-16, notwithstanding two years of war, the average growth was over 32,000 a year. In the last ten-year period—1917-1926—although a further two years of war are included, the number of telephones added was increased to over 60,000 per annum, and the present increase is at the rate of 120,000 stations a year. Although prophecy is dangerous, I have no hesitation in forecasting three million telephones in ten years and nine millions by 1977, the telephone centenary year. My imagination boggles somewhat thereafter as we shall have reached the stage of far more telephones than there are people who are likely to be liable to pay income tax in our tight little island homeland.

Now we must face up to the uncomfortable fact that the development of the telephone in Great Britain lags seriously behind America, Canada and several Continental countries on the basis of telephones to population. What is the explanation of this? Is it the innate conservatism of the British people that makes them slow to adopt telephones? Is it climatic and temperamental differences? The fact remains that telephones for the reception of the wireless broadcast services have been installed in 2½ million homes in four years, whereas exchange telephones have been available for over 45 years and the service has only been installed in a third of a million private houses. I realise the wide difference between the small initial cost of a crystal wireless set and the 10*s.* annual cost of a licence and the cost of the telephone, but the wide gulf between 2½ millions and one-third of a million houses needs bridging as early as possible. The introduction of quarterly payments a few years ago did a great deal, and the more recent introduction of the amount of the deposit to 20*s.* was a step in the right direction.

The conditions in England and America are not in every respect identical, I know, but the fact that the system of monthly payments for the telephone service in the States has been so successful should, I think, present a strong case for a reconsideration of its availability in our own country. With the influx of a great body of new private house subscribers and the further growth of the telephone habit, a still more rapid general extension of the exchange service should result to the benefit of the community.

I am constrained to-night to use the word "psychology," in loving memory of our friend, John Lee, lately Controller of the Central Telegraph Office.

Seriously, I am interested in the psychology or philosophy of advertising and I enjoy seeing the vast improvement of the poster art. I also scan daily the flood of literature which reaches me through the post and ponder on what would be the effect of a like deluge of clever telephone publicity in securing larger increases of subscribers' lines, and—not less important financially—an increase in the use of the service by existing subscribers? It is said that an additional call per line per day would produce £250,000 increase in revenue.

I observe that in modern advertising the method is indirect rather than direct. By post a night or two ago I got a booklet advertising electric lamps, but it is mainly an interesting article on sun-worship with a homily by Sir Arbuthnot Lane on the benefits of artificial light. The next night another firm of electric lamp manufacturers comes along with their brochure in the shape of an equally interesting "Story of Light" from the time of the theft by Prometheus of fire from heaven to the invention of the carbon

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filament lamp by Edison and Swan. Incidentally the prices of lamps were identical. Which firm's lamps shall I buy?

At present, I am a non-smoker; but I am presumably a potential consumer of cigarettes—what Contract Officers call "a prospect"—and am now possibly hesitating on the brink of deciding which particular cigarette I shall favour, Gold Flake, Black Cat, De Reszke, Woodbines or Navy Cut, when I notice a statement in the tobacconist's shop window that £5,000,000 per annum is being spent on advertising cigarettes and is undoubtedly being paid by you smokers! Advertisements can certainly be made interesting and there is clearly room for so unquestionably useful a service as the telephone to chip in as the railway and steamship companies have done to promote travel.

The advertising literature of the Telephone Development Association is already familiar to us and they have favoured me with a few slides of some of their recent efforts, such as, "51 years and not on the telephone! You are behind the times" and "It pays to advertise."

Marvellous as the progress made by the telephone during the past 50 years has been, I have no hesitation in predicting that in the next half-century—and in our own country especially, the current 10 years—will witness still more wonderful technical triumphs in the art and a far more rapid growth in the number of users than in any similar periods. For both of these forecasts the British Post Office staff, its organisation and plant are now well prepared.

If pathos be one of the missing ingredients of this address its omission may be remedied by the contemplation of a man who would have been proud to have been a telephone pioneer, but who after nearly 50 years of happy striving has but developed into a boy scout and in that capacity thanks you for listening to "the old, old story" as he has tried to tell it.

In the ensuing discussion, Mr. H. E. POWELL-JONES (Telephone Development Association) said:—

Mr. Prout asked us why those appalling figures have to be put on the screen to show the backwardness of this country in telephone development. I think the answer is comparatively easy. We are never going to get the telephone habit in this country until we use the same methods to get that habit as the cigarette manufacturers adopt. The cigarette habit is easy because you are given opportunities of indulging that habit every few yards in every street, village and town in this country. If you could indulge your liking for the telephone to the same extent, you would have more of the habit. In the same way, I think, the holiday habit, which is certainly a feature of modern life, owes its existence very largely to the publicity which is issued by railway companies and others interested. Anybody who has anything to do with transport is doing clever work and creating the travel habit. I think, if you compare the relative publicity which is being given nowadays to transportation and communication, which, after all are twin services, you get a very good measure of the lack of publicity in communications.

The Post Office have an extraordinarily good case, but I am afraid it very often goes by default. You find a constant flow of criticism in the papers, which is entirely unfair and not altogether deserved, but you know what happens when a new boy goes to school. If he is of a timid, shrinking, apologetic type who will not stand up for himself he generally gets a bad time, and it seems to me that it is the Post Office's own fault that you get such a bad time at the hands of the Press. If you go back to 1912 and realise the difficulties with which you were faced, and the extraordinarily able way in which they have been overcome, it is a very fine case, and I think you can safely rely on that instinctive sense of justice of the British people if you state your case more frequently. Advertise yourselves and you will find the whole sympathy of the British people is with you instead of very largely, I think, against you.

On this question of advertising I do not want to be misunderstood: I do not suggest that the Post Office should do its own advertising—still less that it should hand over that advertising to any one expert, but I think there is a very good case for the handling of advertising of the Telephone Service by a Committee on the lines of the Empire Marketing Board. You must not be afraid of tradition; I know there is an old tradition that the Post Office does not advertise. But the State has now realised since the war how much they owe to advertising.

Mr. Baldwin said recently: "On the selling side, we must modernise our methods and make use of the great development which has taken place recently in the art of advertising."

A couple of days later, Mr. Amery said: "Advertising is essential to promote efficiency." And then Mr. Ormsby-Gore said that advertising to-day is recognised by every responsible person in the country as being a necessary factor in prosperity. Sir Alfred Mond said it had always seemed to him a fallacy to imagine goods could be sold by waiting for someone to come along and buy them.

It seems to me extraordinarily illogical that you should have one Government spokesman after another speaking fervently of the benefits of advertising and yet the Post Office telephones—one of the greatest businesses in this country, and a profitable business—are not allowed to advertise.

In certain directions you can advertise without spending much money. For instance, the public have very little idea of what the large drums to be seen in the streets are. Why should you not put up a notice saying: "We are putting down telephone cables to serve the district of so-and-so; now is your chance to get a telephone."

Col. C. B. CLAY described his early efforts at telephone advertising in the North of England Telephone Co., and related some anecdotes of the early rivalry of telephone companies.

Mr. DAY said he did not think Mr. Powell-Jones was at all happy in his selection of the examples of the beneficial results of advertising. He would have been more impressed with an example of public advertising in connexion with a great public utility. For instance, the cigarette trade was not to be compared with an organisation like the telephone.

Passing on to the Press, he could not see that the Post Office telephone administration received much unfair criticism. There was very little criticism indeed appearing in the Press, and he believed the people of this country were well satisfied with their telephone service, coupled with the difficulty that the Administration had to overcome. He thought personally that the Treasury could quite easily make out a very good case against a Government Department embarking on advertising in the way referred to by Mr. Jones. What that defence would be he had not the time to outline, but it did assume that the public ownership of a great utility was in itself desirable.

He submitted that the final test of any administration, Government or private enterprise, could be simplified in two ways. One was: Were the discoveries of the scientists and the inventors embodied in the system as quickly and as rapidly as they were brought to the notice of the administrator; and secondly: Was the administration, from top to bottom, such that the greatest number of people obtained the maximum benefit? It seemed to him that these were two acid tests, and as time went on they would be able to say that a Government Department in Great Britain could command the services of men able to deliver the goods and give the utmost benefit of the inventor.

Mr. DIVE said that, speaking from his own personal experience, he never had been ashamed of the fact that he was in the Post Office and in the telephone service, and he took courage to say that he had defended both on many occasions and driven the war into the enemy's camp when he had had the pleasure of meeting the heads of great commercial houses who were anxious to teach the Post Office their business.

Speaking of advertisement, only that morning, he saw an advertisement to the effect that a big business house gave the pictures of 12 ladies who had been chosen by the staff as the 12 most beautiful girls on their staff, and they were put in mannequin parades so that the public could give a vote. He studied their faces very intently and he was bound to confess that there was not one of them that could not have been matched in the telephone service of London.

Mr. MUIRHEAD paid tribute to Mr. Prout's personality and to the great part he had played in telephone development. He thought that advertising led to heightened production all round and benefited the whole community.

A BRIEF CHRONOLOGY FOR STUDENTS OF TELEGRAPHS, TELEPHONES AND POSTS.

BY HARRY G. SELLARS.

(*Continued from page* 44.)

A.D.		
1663	...	... Lease of Post Office transferred from Henry Bishop to Daniel O'Neale.
		Profits of the Post Office (and wine licences), worth £21,000 per annum, settled on the Duke of York.
		Marquis of Worcester suggested a system of telegraphy.
1664, Oct.		... Daniel O'Neale died and his widow, Katherine, Countess of Chesterfield, held the lease. Colonel Phillip Frowde was manager during O'Neale's holding.
1665	...	... Sir William Penn drew up a code of flag signals. M'Arthur and Lord Richard Howe, in later years, improved the arrangement.
1666	...	... General Post Office removed to the "Two Black Pillars" in Brydges Street, Covent Garden, London, owing to the destruction by fire of the "Black Swan," Bishopsgate.

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1667, Oct. ... Lord Arlington and Lord Berkeley became joint lessees of the Post Office for ten years at an annual rental of £25,000. Sir John Bennett and Andrew Ellis acted as deputies for Arlington and Berkeley, respectively.

Robert Hooke described how sound could be transmitted by means of a tightly stretched wire.

1668 ... ... Bond observed the variation of the compass.

1672, June ... Sir John Bennett left the Post Office and Andrew Ellis took over sole management. Ellis died in less than a month and his widow transferred her interest to Colonel Roger Whitley. On July 29 Whitley was appointed Deputy Postmaster-General.

1675 ... ... Boyle experimented with a view to ascertaining the origin of electricity, using a resinous cake.

Newton and Boyle used glass in construction of electrical machines.

1675, Aug. 10 ... Greenwich Observatory founded.

1676, Jan. 13 ... Sir Isaac Newton exhibited to the Royal Society a glass electrical machine in which a brush of hog's bristles was used to rub the glass.

Boyle published an account of his electrical experiments. Von Bose added a "prime conductor" to von Guericke's electrical machine.

1677 ... ... Revenue of Post Office settled on Duke of York, on whose behalf Whitley remained as "manager" for a few months. The Earl of Rochester was then appointed Postmaster-General and Philip Frowde, junior, managed the office under the title of "Governor."

1678 ... ... Swammerdam demonstrated to the Grand Duke of Tuscany that the muscle of a frog's leg contracted when brought into contact with silver and copper.

1680 ... ... Dockwra, a merchant, organised a private penny post for London, and introduced postmarks. Letters and parcels carried.

1681 ... ... Another Penny Post introduced in London by Robert Murray, upholsterer.

1683 ... ... Robert Murray assigned Penny Post to Dockwra.

Halley published his theory of magnetic variations.

1684 ... ... Dr. Hooke suggested a system of telegraphy.

1685 ... ... Revenue of the Post Office, estimated at £65,000, reverted to the Crown (James, Duke of York, became King James II).

1686 ... ... Otto von Guericke died.

Pension of £4,700 per annum granted to Barbara Villiers, Duchess of Cleveland, and to her successors the Dukes of Grafton, out of Post Office revenue.

1686, Dec. ... Earl of Rochester granted a pension of £5,000 per annum to be charged to Post Office account.

1688 ... ... Mail packet service established between Falmouth and Corunna, and shortly afterwards between Falmouth and Lisbon, North America and West Indies.

1689, April 12 ... Major John Wildman appointed to take possession of the Post Office and to exercise the powers contained in various Acts of Parliament.

1690 ... ... General Post Office removed to Sir Robert Viner's mansion in Lombard Street, London.

1691, Feb. ... Wildman dismissed from the Post Office and Sir Robert Cotton and Sir Thomas Frankland became joint Postmasters-General. The office was held by two persons until 1823.

1694, June 20 ... Creation of a Secretaryship to the Post Office authorised. Mr. Wilboyl appointed.

Pensions charged on Post Office revenue amounted to £20,000 per annum.

1695 ... ... Scottish Parliament set up a separate Post Office and Postmaster-General for Scotland.

1699 ... ... Net revenue of Post Office £77,384.

1700 ... ... One penny paid to Private Shipmasters for each letter handed to the Post Office in this country or the Colonies.

1701, Jan. 21 ... Postmaster-General authorised to appoint a Deputy Postmaster-General for Scotland. Mr. G. Maine appointed at Edinburgh.

1702 ... ... Act of Parliament sanctioned the customary payment of one penny made to Ship Masters for each letter handed to the Post Office, and granted to the Postmaster-General the monopoly of conveying letters in the United Kingdom and Colonies.

1704 ... ... First American newspaper (*Boston News Letter*) appeared.

1705 ... ... Francis Hawksbee observed the resemblance between the electric spark and lightning.

Postage for letters *to* the West Indies 1*s*. 3*d*. a sheet, *from* the West Indies 1*s*. 6*d*. a sheet.

1706, Jan. 17 ... Benjamin Franklin born in Boston, Massachusetts.

Stephen Gray experimented in electrical attraction, conduction, and excitation.

1708 ... ... Charles Povey established a halfpenny foot post in the London district.

1709 ... ... Mails for certain places abroad dispatched on Mondays, Tuesdays, Thursdays and Fridays; to Ireland on Tuesdays and Saturdays; to Wales on Tuesdays and Saturdays; to Scotland on Tuesdays, Thursdays and Saturdays; to places in England every day. Letters reached London from all parts of England and Scotland Mondays, Wednesdays and Fridays; from Wales, Mondays and Fridays; from Kent and the Downs every day; "but beyond sea uncertain." Postage 2*d*. a sheet up to 80 miles, packets 8*d*. an ounce. Over 80 miles, 3*d*. a sheet, packets 12*d*. an ounce. Letters to Dublin, 6*d*. a sheet, packets 1*s*. 6*d*. an ounce.

Hawksbee improved the electrical machine.

1709, Nov. 29 ... Notice published in the *London Gazette* abolishing Povey's Halfpenny Post, and fixing fines for setting up and continuing the business.

1710 ... ... English and Scottish Post Offices re-united under one Postmaster-General. Postage calculated according to distance. Revenue divided between the public exchequer and the Crown.

1710, Oct. 2 ... Richard Dyot, J.P. for Middlesex and Commissioner of the Stamp Office, arrested for counterfeiting stamps.

Gross revenue of Post Office £111,461, cost of management £44,639, net revenue £66,822.

1711 ... ... General Post Office set up for the "three kingdoms and the Colonies," the Postmaster-General having to pay £700 "into the Exchequer upon Tuesday in every week."

1711, June 23 ... Act of Parliament put into force abolishing the Penny Post and assimilating all postage rates to those of the General Post Office.

1713 ... ... Stamp duty imposed on newspapers.

1716 ... ... £17,000 lost to Post Office through "franking."

1719 ... ... Ralph Allen, Postmaster of Bath, offered to take the bye and cross-posts on lease at a rent of £6,000 per annum.

1720 ... ... Angle of magnetic "dip" in London reached maximum of 74 deg. 42 min.

Stephen Gray and Wheeler "discovered" electric induction.

1721 ... ... Gross revenue of Post Office £168,968, cost of management £69,184, net revenue £99,784.

1722 ... ... Marcel observed that a bar of iron became temporarily magnetic if placed in certain positions.

1724 ... ... Graham found that the compass needle undergoes daily directional variations.

1727, Mar. 20 ... Sir Isaac Newton died at Kensington, London, and was buried in Westminster Abbey.

1727, Oct. 17 ... John Wilkes born in London.

1728, Nov. 27 ... Maintenon born.

1729 ... ... Stephen Gray, a pensioner of the Charterhouse, discovered that some bodies conduct electricity more freely than others. He found that a cork in the end of a rubbed glass tube attracted light bodies.

1730 ... ... Du Fay, of Paris, sent a charge of electricity through 1256 feet of moistened thread.

1731 ... ... Prof. Boze, of Wittenburg, added a "prime conductor" to Sir Isaac Newton's electrical machine.

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Symmer propounded the "two-fluid" theory of electricity. He also observed that similarly electrified bodies repelled each other and that bodies having unlike charges attracted each other.

Du Fay, working independently, reached conclusions in connexion with positively and negatively charged bodies similar to those of Symmer. He named the two dissimilar kinds of electricity "vitreous" and "resinous."

£38,000 lost to Post Office through "franking."

1736, June 25 ... John Horne Tooke born in Westminster.

1736, Aug. 23 ... Charles Augustin de Coulomb born at Angouleme.

1737, Sept. 9 ... Luigi Galvani born at Bologna.

1739 ... ... Emerton patented a wood preserving compound.

1740 ... ... Bernoulli calculated the lifting power of a magnet.

1741 ... ... Winckler, of Leipzig, devised a cushion for the rubber of an electrical machine.

1742 ... ... Desaguliers classified bodies as "electrics" or "non-electrics."

Gordon, of Erfurt, replaced the glass globe in von Guericke's machine by a glass cylinder.

1744, Jan. 2 ... Joseph Milner born at Leeds.

1745, Feb. 19 ... Alessandro Volta born at Como.

1746 ... ... Leyden Jar principle discovered by Von Kleist (Bishop of Pomerania), Muschenbroek, or his pupil, Cuneus. Uncertainty exists as to whom the credit is due.

Winckler constructed a Leyden battery.

1746, April ... Abbé Nollet discharged a Leyden jar through a number of Carthusian monks joined together by iron wires and forming a circle 5,400 feet in circumference, the simultaneous contortions of the monks proving the presence and speed of the current.

Fontana noticed that the internal volume of a Leyden jar increased when it was charged.

Artificial magnets made by Dr. Gowan Knight.

(Scoresby suggested laminated magnets.)

1747 ... ... Benjamin Franklin announced his theory of a single electric fluid.

Louis XV, of France, caused a charge from a battery of Leyden jars to be passed through 700 Carthusian monks joined hand in hand.

Sir W. Watson suggested the "plus" and "minus" theory of electricity.

1747, Aug. 5 ... Dr. Watson proved that electric current could be transmitted through a wire using the earth to complete the circuit.

1749 ... ... Franklin, by means of a kite, proved the identity of electricity and lightning and invented lightning conductors. Franklin introduced the terms "negative" and "positive" in connexion with electricity. He also supposed that the Aurora Borealis was due to electric discharges in the upper air, and devised a plate condenser or "fulminating pane."

1749, Mar. 23 ... Pierre Simon Laplace born at Beaumont-en-Auge.

Net revenue of Post Office £97,398.

1751 ... ... John Canton introduced an amalgam for the rubber of electrical machines.

1752 ... ... Sulzer drew attention to the "taste" produced by laying two dissimilar metals upon the tongue.

Lemonnier observed that electricity was usually present in the atmosphere.

Franklin invented the "electric chimes" to warn him of the presence of atmospheric electricity drawn from the air by pointed iron rods.

Dalibard, of Marly-la-ville, acting on Franklin's proposal, erected an iron rod 40 feet high and drew sparks from a cloud.

1753, Jan. ... Richmann, of St. Petersburg, experimenting in atmospheric electricity, was killed by a discharge.

Romas, repeating the kite experiment of Franklin, obtained sparks nine feet long.

1753, Feb. 17 ... Charles Morrison, writing in the "Scots Magazine," suggested using an insulated wire for each letter of the alphabet, and passing a charge along the wires to spell words.

John Canton "discovered" electric induction.

1758 ... ... Beccaria published his researches on atmospheric electricity.

(Mascart, in Paris, demonstrated variations in atmospheric electricity, at various times of the day. Guy Lussac showed variations in atmospheric electricity at various heights.)

Beccaria noticed that electrified liquids evaporated more quickly than those which were not electrified.

1759 ... ... Franz Maria Ulrich Theodor Æpinus and Wilke devised the first condenser with a stratum of air between two brass discs.

Æpinus also constructed a condenser with a dielectric consisting of air space and a plate of glass.

(Fizeau constructed a plate condenser.)

1760 ... ... De la Fond, Planta, Ramsden and Cuthbertson constructed electrical machines with glass plates.

Hereditary revenues from the Post Office surrendered to the State, a Civil List being granted by Parliament for support of the Royal Household, &c.

1764 ... ... An Act of Parliament allowed Members of Parliament to "frank" correspondence.

Postmaster-General obtained permission to set up in provincial towns a penny post similar to that which had been in force in London since 1680.

Profits on bye and cross-posts amounted to £20,000 per annum.

Ralph Allen, who had organised cross-road posts all over the country, died.

1765 ... ... Postage reduced on short-distance letters.

1767 ... ... Dr. Priestley suggested formation of an Electrical Society.

Lane produced a discharging electrometer.

1768 ... ... Geuns, of Venlo, suggested the construction of compound magneto. A. L. Lavoisier conducted experiments in electricity.

1771 ... ... Cavendish showed that the attraction between two small electrically-charged bodies is inversely proportional to the square of the distance between them.

1772 ... ... Henley produced a discharging electrometer, and a "Universal" discharger for discharging Leyden jars, or condensers.

1773 ... ... Ingenhousz and Cavendish investigated the electrical state of certain fishes.

1774 ... ... Lesarges tried a telegraph system at Geneva similar to that proposed by Morrison in 1753.

Court of King's Bench ruled that within the limits of a post town—to be defined by the Postmaster-General—delivery of letters should be free.

Richard Lovell Edgeworth invented the shuttle telegraph for distant visual signalling.

1775, June 10 ... André Marie Ampére born at Lyons.

1775, July 5 ... William Crotch born at Norwich.

Cavendish discovered that the capacity of a condenser depended upon the inductive power of the dielectric.

Count Alessandro Volta, of Como, invented electrophorus.

(Phillips made the electrophorus more efficient by pasting strips of tinfoil across the surface of the lower disc.)

Biot proved that an electric charge resides on the surface of a charged body. He also showed variations in atmospheric electricity at various heights.

1776, Aug. 16 ... William Hyde Wollaston born at East Dereham, Norfolk.

1777, April 30 ... Johann Karl Friedrich Gauss born at Brunswick.

Hans Christian Oersted born at Rudkjobing, Denmark.

Lichtenberg produced his electrical figures and investigated the distribution of electricity over the surface of conductors.

George III complained of the bad state of the Packet Boats, and ordered representations to be made to the Post Office.

1778 ... ... Brugmans, of Leyden, observed repulsion between bismuth and both ends of a magnetic needle.

1779 ... ... Coulomb invented the torsion balance for measuring electrical attraction. (Coulomb = Unit of electrical quantity.)

(To be continued.)

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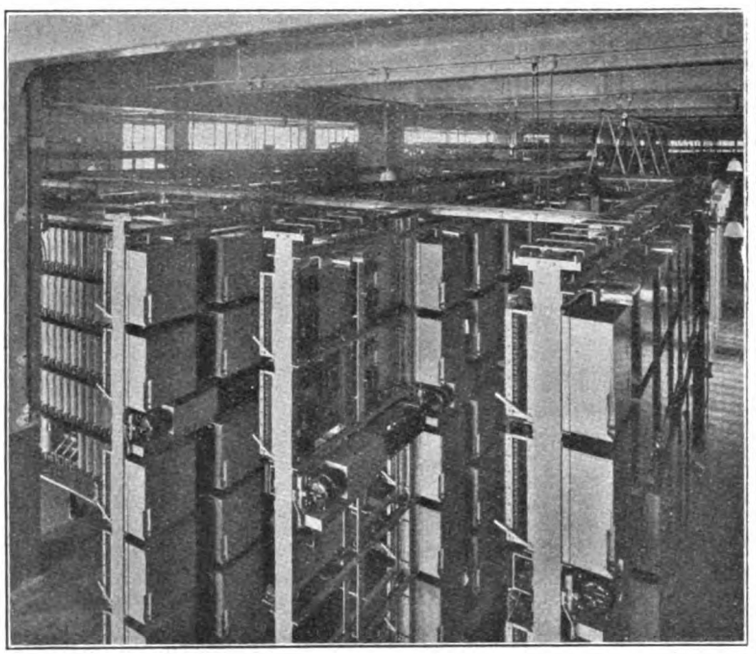
HOLBORN AUTOMATIC EXCHANGE.

THE second stage in the automatic telephoning of Greater London was completed at midnight on Saturday, Nov. 12, when, quite unobtrusively, with no particular flourish of trumpets, automatic working became a reality to nearly ten thousand of London's half-million telephone subscribers.

The development of the "Director" register controller, a clever combination of "Strowger" mechanisms, with almost human characteristics, has hastened the solution of the London telephone traffic problem, and the new 10,000-line automatic telephone exchange at Holborn is the first tangible result.



HOLBORN AUTOMATIC EXCHANGE.—GENERAL VIEW, SHOWING "DIRECTOR" REGISTER CONTROLLER IN FOREGROUND.

The equipment is housed in the same building as the mechanical Tandem equipment, recently put into service and with which it will be so intimately associated during the necessarily prolonged transition period, when the "old" and the "new" systems have perforce to work side by side and in unison, until such time as the whole of the Greater London telephone area has been equipped for automatic working.

In many respects the new main automatic equipment at Holborn resembles that of other comparably equipped exchanges of high capacity, but in addition to the usual complement of lineswitch units, trunk selector boards, group and final selectors, familiar to all who have studied the principles of "Strowger" automatic telephone equipment, it possesses outstanding characteristics in its "Director" register controllers, in effect the brains of the exchange.

To serve the 9,400 subscribers for which Holborn is at present equpped, there are 222 of these "Director" register controllers, or roughly one to every 42 subscribers connected. Traffic records go to show that this proportion will suffice, having regard to the fact that, having performed its function of "routing" the call from the area of origin to that in which the wanted subscriber is situate, the "Director" register controller is immediately available for further use, and is not "tied up" for the duration of the call which it has assisted in maturing.

Holborn telephone subscribers, and eventually all telephone subscribers in the Greater London area, as and when their respective exchanges are equipped with "Strowger" mechanism, will "dial" seven digits comprising three letters, representing the initial letters of the exchange to which the wanted number is connected, followed by four numerals representing the actual number in that exchange.

The "Director" register controller performs three main functions, namely :—

(1) Receives and stores the call.

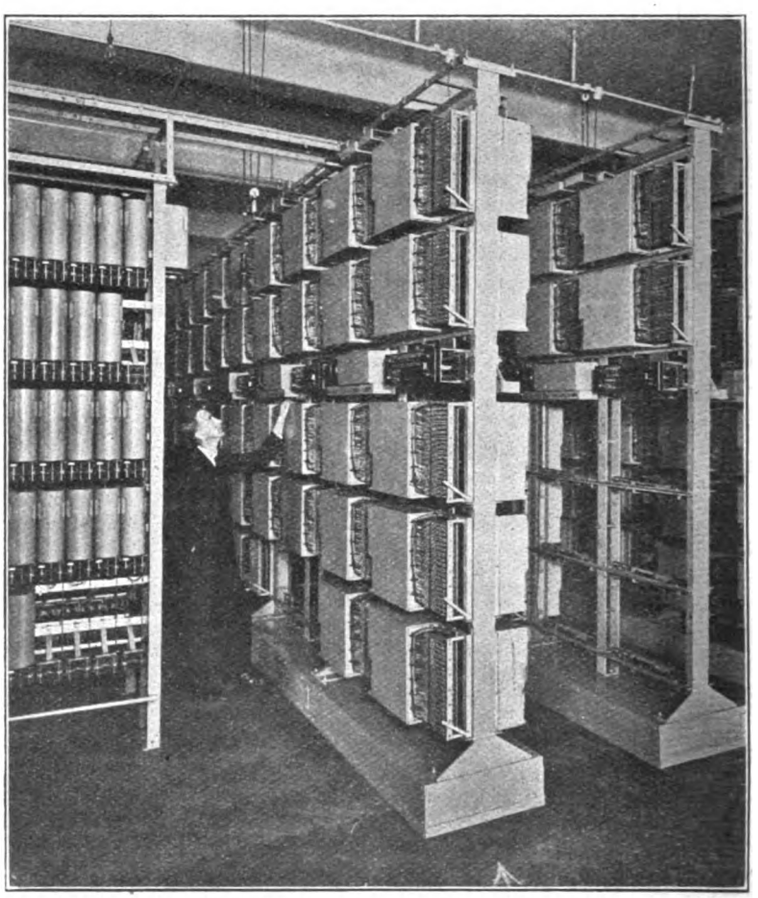
(2) Translates the three code (letter) impulses, in order that the call may be directed over the best available route.

(3) Transmits, firstly, the translated code impulses and secondly, the four numeral impulses.

It will therefore be realised that the routing of calls is not directly effected by the trains of impulses corresponding to the three letters as dialled The "Director" register controller translates these first trains of impulses into a particular form, which depends upon the number of selectors, and the various levels of the same, over which the call has to be "routed." The translated trains of impulses, as transmitted by the "Director" register controller may be, and in fact are, entirely different to the impulses corresponding to the code letters. Thus, the dialled impulses 236 for CEN (CENtral) may become another series altogether, up to six digits, as sent out by the "Director" register controller to actuate the routing selectors which serve to extend the connexion to the desired exchange.

To explain exactly how this is accomplished is outside the scope of any journal save those specially devoted to telephone technology, suffice it that dialling the first letter operates a selector known as the "A digit switch"; this switch seeks an idle "Director" register controller in a particular group, depending upon the dialled impulses. The chosen "Director" register controller then receives on its "B C switch" the second and third letters as dialled. As a result of the "B C switch" being set to a particular position, the impulses sent out are translated in accordance with a predetermined plan. The control and sending of the new train of impulses are a function of the "Director" register controller. The numerical part of the call is retransmitted in the same form as received.

As soon as the last numerical digit has been dialled and its train of impulses has passed through this sequence of switches constituting the "Director" register controller, the latter, as a complete unit, immediately becomes available for another call, and is selected in its turn by the next subscriber requiring its temporary services.



"DIRECTOR" REGISTER CONTROLLERS.

To ensure constant supervision of the exchange equipment with the minimum of human endeavour, there is incorporated in the "Strowger" equipment at the Holborn exchange an automatic testing installation, termed Routiner equipment, so named by virtue of its functions, which constitute the automatic routine testing of all "Director" register controllers. In action, this Routiner equipment systematically, and of its own volition, subjects each "Directors" register controller in turn to an exhaustive series of tests, representing more drastic conditions than obtain in normal service. Any abnormal condition in an individual unit is thereby detected at an early stage, before it has time to affect prejudicially service, and automatically indicated to the maintenance staff on duty who are thereby enabled to rectify it.

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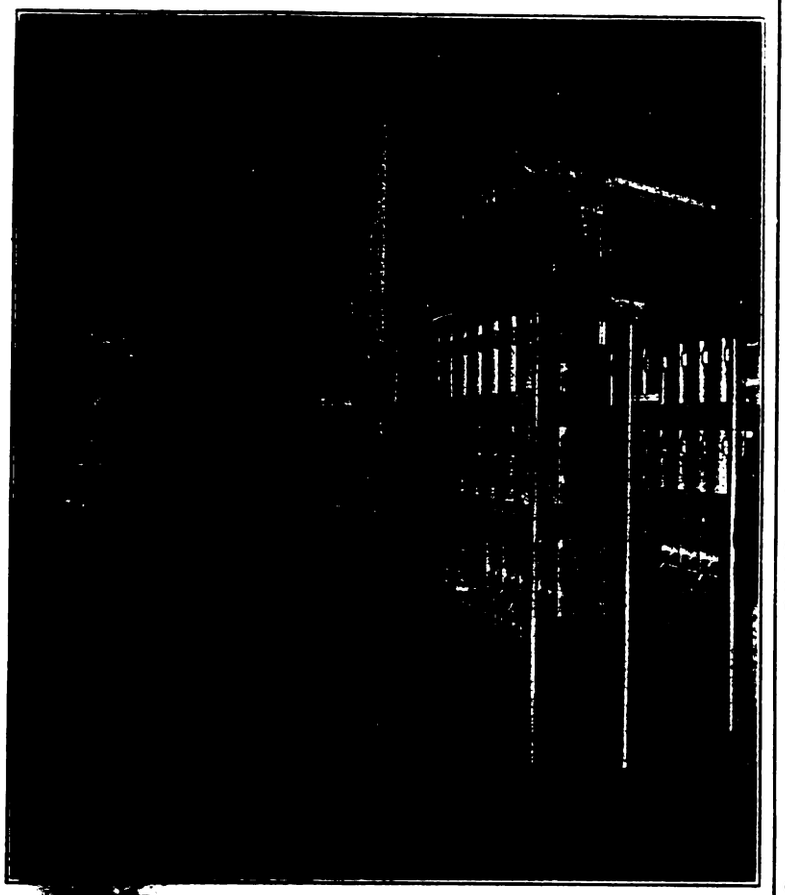
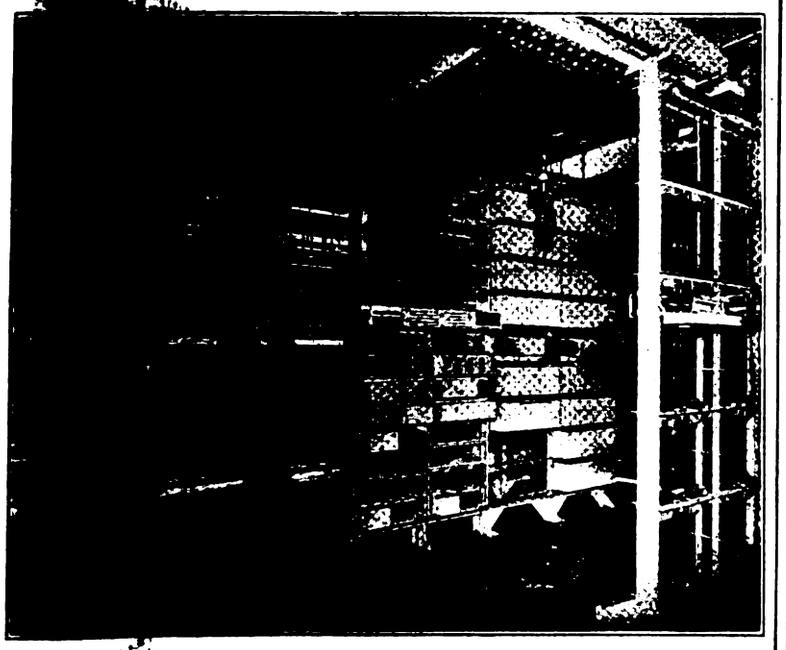
This Routiner equipment, which is set in action by the simple closing of a switch, effects obvious economies in maintenance personnel. Any "Director" register controllers found to require attention can be temporarily



SUBSCRIBERS' METER RACK.

[illegible]service, or "busied" by throwing over an individual switch, [illegible]ing the traffic passing at the time. The necessary adjustments [illegible] effected, the switch is reversed and the "Director" register [illegible]n takes up its normal share of the total traffic load.



STROWGER "ROUTINER" EQUIPMENT.

Another feature of Holborn automatic exchange are the Coders, 80 in all, whose function it is to convert the dialled trains of impulses, received from Holborn automatic subscribers, into appropriate codes of impulses to operate the Coder call indicators at the outlying manual exchanges, where the connexion is completed by the local telephonist. The Coders are analogous to the "Senders" described in connexion with Mechanical Tandem, and comprises groups of relays and rotary lineswitches. As previously described in connexion with Mechanical Tandem, the equipment at these outlying exchanges, which are still manually operated, comprises Coder call indicator positions on the manual board.

A system of lamps disposed below numerical stencils under a ground glass screen let into the keyboard, is controlled by code impulses reacting on a group of relays in such manner that the number dialled by the Holborn automatic subscriber appears on the screen in front of the local telephonist, who picks up a disengaged plug and completes the connexion by plugging in the multiple at her position.

Conversely, for handling manual exchange traffic, incoming from outlying areas to Holborn automatic subscribers, 31 cordless, or semi-"B" positions, are provided. These closely resemble the semi-"B" positions in Mechanical Tandem exchange, and are, in fact, located on the same floor. They are squat cordless switchboard sections, arranged in suites, each telephonist's position being equipped with a row of ten keys numbered 0 to 9, and resembling those of a typewriter. The keys are also lettered similarly to the dials on the London automatic telephones, the numbered keys being each associated with groups of letters. With the aid of these keys the telephonists complete the connexions incoming from outlying manual exchanges for Holborn automatic subscribers.

In addition there is at Holborn a manual switchboard consisting of specially equpped "A" positions. Telephonists at these positions will handle calls from telephone boxes; give information or answer enquiries; investigate complaints concerning the service, and divert official calls into their proper channels.

THE ST. JOHN AMBULANCE ASSOCIATION: LONDON POST OFFICE CENTRE (POST OFFICE AMBULANCE CORPS).

THE Annual First Aid Competition for the London Postal Ambulance Challenge Shield (holders, Inland Section, Mount Pleasant), open to all male officers in any department of the London Post Office, and the Women's Trophy (holders, Savings Bank Department), open to members of the Women's Branches of the P.O.A.C., will be held on Monday, Nov. 14, 1927, at 7.30 p.m., in the King George Hall, Caroline Street, Great Russell Street, W.C.1. Admission by programme, 3*d*. A limited number of tickets for seats will be reserved at 1*s*. each. Members of the staff can assist the funds of the Corps by purchasing a programme from any member of the Corps.

As the P.O.A.C. performs a very important work, and renders first aid to a large number of cases every year in the various departments, it is hoped that as many as possible will attend. Particulars of the competition can be obtained from Miss E. K. M. Meeser, Controller's Office, L.T.S., Cornwall House, Waterloo Road, S.E.1, or Mr. J. E. G. Rogers, Inland Section, Mount Pleasant, E.C.1 (Competition Secretaries).

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OLD TIMERS.

THOSE of us—and I think we are few—who have been fortunate enough to embrace a period of actual manipulative experience in the transoceanic cable services within our career, will remember the day when morse key and sounder played a very active part in dealing with traffic from the London stations; and, of course, the Wheatstone system also contributed its functions.

With the passing of the punching "sticks"—superseded by the "gell"—and the practically universal use of typewriters at morse circuits, the beautiful rhythm of an expert puncher's movements, and the artistic, but copperplate, writing of receiving telegraphists, have gone the way of all things—so far as cables are concerned—to make room for progress in the shape of Morkrums, Creeds, automatics and Baudots.

I think I must have had the pleasure of being acquainted with the fastest stick puncher in the British Isles. His hands, grasping the small rubber-tipped pieces of iron, skimmed over the studs in a light fantastic manner at an astounding speed. For hours this man would maintain this standard of rapidity, and to watch him, in a spirit of appreciation, was an entertainment in itself. To the company's loss, he subsequently resigned and departed, I think, for Honolulu. But, the world is very small, for exactly ten years later this wizard of the "sticks" confronted me in the rôle of sergeant-major at a military depot not a hundred miles from London.

It is no exaggeration to say that, on a day when the temperature was quite normal, beads of perspiration stood out on the brow of a telegraphist whose powers of endurance had been sorely tried by the reception of a continuous and uninterrupted flow of messages for a consecutive number of hours; and practically every one of those messages were couched in the language of cabling commerce—ten-letter code.

At that period the Syphon Recorder system terminated at a retransmitting station situate in Ireland, and here the staff were very proficient in morse dictation from the undulating symbols as they appeared on the recorder slip. One particular member distinguished himself every afternoon, from three p.m. till six, by transmitting Stock Exchange traffic in this manner, at a speed, and with formation, that was not very far removed from that produced by slow-running Wheatstone slip.

Now, in the same company, the typewriter has replaced the pencil and the Syphon recorder system is extended to London, but I understand that, although, of course, vast improvements have been made, the Wheatstone system is still favoured to a great extent, and automatics, &c., are taboo.

A recent introduction to duties connected with the "Beam" assisted to remind me of those days, but rapid though the service was, it could not—and I doubt if it does now—defeat the speed at which our latest system of overseas communication is capable of working—that is, in a given space of time.

W. T. L.
(*Central Telegraph Office.*)

CORRESPONDENCE.

A JAPANESE APPRECIATION OF MR. LEE.

TO THE EDITOR OF "THE TELEGRAPH AND TELEPHONE JOURNAL."

Sir,—As the controller of the greatest telegraph office in the world, and also as a worldwide authority on telegraph communication, the name of Mr. John Lee is well known even in this far eastern country.

It was at the beauty spot of Cortina d'Ampezzo, Italy, that I had the great delight and honour of making acquaintance with him, last summer, on the fortunate occasion of the Committee Conference on Code Languages for the International Telegraphs, to which I was sent to attend by the Japanese Government.

The bright, fascinating scenery of the surroundings, combined with the genial climate, was certainly a great help to efficient progress in the solution of the rather toilsome but very important problems of the subject, but that Mr. Lee's dauntless exertions and adept skill played the greatest part in creating a friendly atmosphere, there was not the least doubt. His natural humour and wide and deep knowledge acquired by long experience in practical participation in the telegraph service were fully displayed when discussions among delegates were keen and the situation seemed to be difficult.

Cortina and its vicinity were certainly one of the most lovely parts in the southern Alps, and displayed their utmost beauty when, by the courtesy of the Italian delegation, an excursion party composed of the whole delegates and their ladies drove in autocars along the zigzag paths, by the beautiful lakes and under beetling precipices. On this occasion Mr. Lee and I had a memorial photo taken together on the shore of lake Alleghe. By these contacts with him, I was able to divine the noble character which played a very influential rôle in his long and eminent career. He is a man of human warmth as well as a strict reasoner, and a highly cultivated person.

On visiting later the Central Telegraph Office of the G.P.O., London, *en route* round the world, after the close of the Cortina Conference, I had again the pleasure of seeing him, this time in his very headquarters. After being cordially received, I was accorded many facilities for observing the excellent system of the London telegraph service. The amount of knowledge and experience I was given by him and his office was very valuable, for which my gratitude to him was boundless, and ever since I have been an admirer of him.

To my great surprise, the recently received *Telegraph and Telephone Journal* brought the unexpected news of his resignation, and I cannot help feeling a genuine regret not only for the British but also for the International Telegraph Service, which sustains a great loss by the retirement of such a distinguished leader. My mind is full of emotion to find, on the page containing the report, the very picture taken on lake Alleghe which spontaneously recalls those memorable and happy days in Italy and England.

The great services he has rendered to the development and completion of the telegraph communication in great Britain as well as in the world are fully appreciated and recognized by the public and I shall have no need to repeat them here.

Now he has retired amidst heartfelt praises, leaving that which he built to the care of his good successor. My sincere wish as one of his reverent juniors is that he may be spared to enjoy a happy leisure and a long and healthy life and that he will, when he feels like it, impart his valuable experiences to others.

The Central Telegraph Office,
Osaka, Japan.

S. HIROSHIMA.

THE RETIREMENT OF MR. J. E. A. SORRELL.

THE coastal Telegraph Repeater officers may be classed among those modest flowers which prefer to bloom unseen. Mr. Sorrell was typical of his class. He has now passed out of active service upon reaching the age-limit, a service which he has adorned since Jan. 1, 1884, when he commenced his career as a telegraphist in the C.T.O., transferring to the Repeater class as Relay clerk ten years later. As a telegraphist he was a front ranker in efficiency, as a relay clerk his standard was equally high, but as Officer-in-Charge, J. E. A. S. surely touched the high-water mark of Repeater Office supervision.

There was very seldom, if ever, need for reports to "higher quarters" with Sorrell, for he had a wonderful understanding of human nature, and as a result rendered A1 service to the State while maintaining an atmosphere of good fellowship with all those around him.

This is not to say that he was slack in real discipline, for no delinquent could ever get ahead of Sorrell's high-speed lectures, nevertheless, no staff ever had better counsel for their defence.

Mr. Sorrell represented the British Post Office repeater office interests in 1910 as a member of the Anglo-German Telegraph Commission, which spent one month in Germany and one in the British Isles in examining several technical difficulties. During the war he was in charge of the Lowestoft Cable Repeater Office, which at that time was situated on the beach just below one of the "scores." The humour (?) of the situation did not miss our now retired colleague who directed a friend's attention to the fact that although the cable office was boarded up, surrounded by corrugated iron sheeting and protected by a military guard, only the latter were provided with a dug-out during raids, it being presumed that the civilian telegraph staff would carry on—which they did. The experience of six nights spent in that "ark on the sands" with a Zeppelin raid each night and the desolate view of an uninhabited seafront of broken windows each morning will be remembered by all those of us who formed the emergency staff during a week of complete breakdown of the East Coast land lines. Outstanding, however, beyond all these transient inconveniences, is the recollection of J. E. S., cheerful, unperturbed, unselfish, considerate of others through it all, though he had already had months and was yet to have many months more of this anxious chargeship.

Such eulogia some may say should be left unuttered for the present, but why, may I ask, should we always wait till the funeral day to tender our floral offerings?

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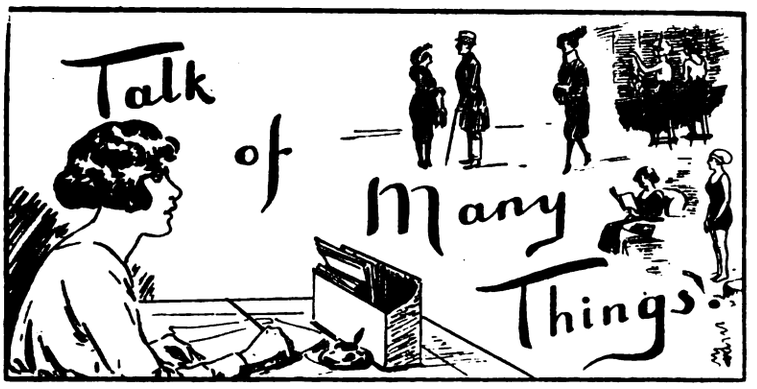
WE TELEPHONISTS



The Birthright.

THIS article was very nearly not printed because of a slight misunderstanding with my typist. At one stage in the proceedings matters were so critical that I had visions of being compelled to write the article by hand. That, of course, would have been exceedingly awkward because, some time ago, the printer gave me to understand "once and for all, that" —well, anyway, he was extremely rude about my caligraphy. So, you see, I am rather dependent upon the typist to interpret the signs and wonders which somehow wander across my notepaper and resemble the footprints of bees after, say, the Bees' Wedding. Sometimes, clever as she is, her brows furrow deeply, and then I dictate, and that's how it was this month. No sooner had I uttered the title, however, than she closed her note-book with a snap, and blushed. Really, if I was going to dictate matter on that subject, she said, I must engage another amanuensis. Things about population were not so bad, but—and then she dabbed one eye with a tiny handkerchief. "But, but," I said, "I say, you know—really—what I mean to say is—tut, tut—what's the matter with birthright?" "Everything," she said, decisively. And then a great light dawned upon me. "I said birthraight, not birthrate," I said. "Yes," she said, "I know—I'm not deaf." "But"—well, blow it all. I said soothingly, "birthraight—you know, the mess of pottage business." "Oh!" she said, "Yes, of course; I was forgetting your Oxford accent. *So* sorry." And so here we are, rather less hot and bothered than formerly, thank you.

I'm concerned about our birthright because in this year 1927 I feel that we are being cheated thereof. Fifty-two Sundays, one Good Friday, and one Christmas Day: that's what we've always been used to: it was good enough for our fathers and mothers, and that's what we want. And what have we got this year? Fifty-two Sundays, one Good Friday but *no* Christmas Day because, forsooth, Christmas Day falls on a Sunday! Is this the thin edge of the economy wedge? If so, it won't be long before Good Friday will fall mysteriously on a Sunday and then where shall we be? Or else there's something wrong with the calendar. I said at the time that is was a mistake not to let Messrs. Whittaker & Letts look after the calendar instead of allowing the Julians and the Gregorys to butt in. If it's not due to economy or calendars it must be due to Summer time. They've monkeyed about so much with the clocks that, despite their cunning, someone has blundered and we, who labour by day and by night and on Sunday, Good Friday and Christmas Day, are the losers.

And who cares? Nobody. Those thousands and thousands of the great British Public who will sit round the groaning board on Dec. 25, 1927, eating their way through seasonable fare: those who, later, will be blaming the mistletoe or attaining their end via Postman's Knock—will they give us a pitying thought? Not a tear, not a sob. No! when we crawl home feebly after duty our lot will be a bony carcase, a few pudding crumbs, and some empty mince-pie lids. And—the mistletoe queue will be full. Alas!

Meantime the problems of Automatics, C.C.I. and Tandem routes have receded into the background. The great and insoluble question of the moment is, "Shall duty performed on Dec. 25, 1927, be regarded as Sunday duty or Christmas Day duty, and if not both why either or which of the two?"

However, may you all have as happy a Christmas as the circumstances will permit.

PERCY FLAGE.

Sydenham Exchange.

The first dance of the Winter Season was held on Oct. 25, 1927, at the Dartmouth Hall, Forest Hill.

The Committee was fortunate is securing the services of Mr. Townsend, who was an excellent M.C., and distributed the prizes to the following Tennis and Swimming Club prizewinners:—

Tennis Tournament: Experienced Players.—
1st prize.—Miss E. Songhurst.
2nd „ Miss B. Lewis.

Tennis Learners.—
1st prize.—Miss R. Wireman.
2nd „ Miss M. Callen.

Swimming Club.—
1st prize.—Most Enterprising Member: Miss M. Whorewell.
2nd „ First Learner to Swim: Miss Franklin.

A pleasing feature of the evening was the presentation of a bouquet from the staff to Miss Bowley in appreciation of the keen interest she always takes in the social work of the Exchange. The Secretaries of both clubs were also the recipients of beautiful flowers presented to them by the members.

A special work of thanks is due to Miss Arnott, who gave much of her time to the preparation of refreshments, and to whose organising abilities the committee is greatly indebted.

The dance was a social and financial success, and we hope to welcome our many friends again at the Social to be held on Tuesday, Jan. 3, 1928, at the Hamilton Hall, Forest Hill. Our library needs extending to allow scope for educational purposes, and we hope that the Social will enable us financially to fulfil the scheme we have in mind.

May I—with the permission of the Editress—inform colleagues at other exchanges that we should be pleased if they would join us for Winter Tennis. Cobb's hard courts at Silverdale, Sydenham, have been engaged and the fee for the season is extremely moderate.

G. M. T.

A Telephone Romance.

(*Continued.*)

After the "breakdown" it only took them five seconds to "pick up" all their belongings, including the "Tandem" which the bridegroom carefully "tested" for "faults," and after close "observation" found the "lamp cap" to be bent. This "minor irregularity" was soon adjusted, but upon closer "observation" he found one of the saddles to be in a "dropped position," so after rescuing his goggles, which his bride laughingly called his "face equipment," they "abandoned" the Tandem and set out to walk.

Before starting, the bride "arranged" her hair with the aid of her sister "Addis combe" and refreshed herself with some "Mitcham" lavender water. After proceeding for some distance they found themselves in the wrong "Area," so the bridegroom "rang the bell" at a neighbouring cottage, and when a "quick answer" was received remarked "I am sorry that you have been disturbed," but I fear that we are on the "wrong route," and added "We came via Tandem" but had to "abandon" it owing to an accident, which caused "repeated faults." They were soon advised of another route, and instructed *re* their "correct procedure," so turning "East" and a little later to the "North," their villa soon appeared in view. As they approached, it looked very "effective" with its windows "glowing with lights," its "flimsy" curtains, and its wallpaper patterned with "green rings."

After they had rested for a short time, the bride suggested that she would like to change her attire, and appeared later in a "multi" coloured dress which "emphasised" her "curves" and was "finished" at the waist with a "double-ended cord."

A "circulating message" must have been sent of their arrival for several visitors arrived to tea, including the bridegroom's old army friend, "Major Irregularity" (with whom he played in the same team at "Fulham") and several connexions of both families. With the "tee over" and the "American Service" "restored" to its place, several speeches were made, and among other things it was agreed that they were "coupled correctly" and that their "establishment" at "Mount View" should be a happy one.

The bridegroom thanked them in a few well-chosen words and ended by saying that they both viewed the future through a "fixed" "red glow" with no "bar" to their happiness.

After this someone suggested a song, and the bride rendered The Holy "City" in a low but "audible tone," and after "repeated demand" the bridegroom "obliged" with The Lass o' "Richmond" hill, which he sang in "ringing tones" with a good, rising inflexion.

For their further adventures see our next issue.

D. D.

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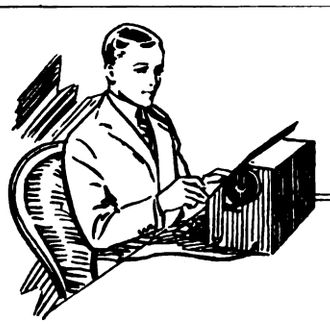

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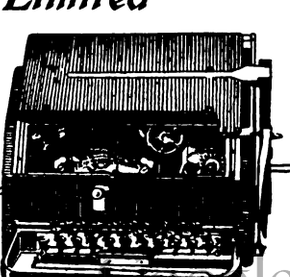

At the Board.

(With apologies to Thomas Hood.)

Pick it up tenderly
Treat it with care,
Fashioned so slenderly
Fragile and rare.

Hold the plug gingerly,
Don't touch the cord,
It frays so easily,
Spoiling the board.

Push the plug gently
Swift but unflurried;
Exercise common-sense,
Careful though hurried.

After the call ends
Guide to the socket,
Should it lie idly there
Someone may knock it.

When the day's over
Swiftly its hurled,
Anywhere, anywhere,
Out of the world.

D. D.

London Telephonists' Society.

The paper read by Captain Reid last month was very good indeed. "Psychology," the title read, which covered most of what he said. He told us, to our stupefaction, why we make such and such an action. He spoke of our response to touch, to sight and hearing; stressing much that the important thing to do is "Find the *other's* point of view." And flights of airman next were seen, in simple graph form, on the screen. Their "standards" varied quite a lot—some peaks were high, and some were not. The high deserved some obloquy, the low showed rare efficiency. We liked it all—the only rift was that it seemed too short, too swift. Then Mr. Pounds bestowed a mead of well-earned praise on Captain Reid. To which the members said "Hear, hear; we hope you'll come again next year."

December 2nd next, please note (the title is too long to quote) when, though its cold, or dark, or damp, let's all come out for Mr. Camp.

Remember, too, within your reach, that guinea for the finest speech!

Contributions to this column should be addressed: THE EDITRESS, "Talk of Many Things," *Telegraph and Telephone Journal*, Secretary's Office, G.P.O. (North) London E.C.1.

LONDON TELEPHONE SERVICE NOTES.

London Telephonists' Society.

THE second meeting of the London Telephonists' Society for the current session was held on Friday, Nov. 4, at the City of London Y.M.C.A., Aldersgate Street, E.C.1.

A concert, arranged by Mr. Hugh Williams, was given by members of the Accounts Branch. The music, both pianoforte and vocal, was delightful, and was received with enthusiasm by an appreciative audience. At the conclusion of the concert a very hearty vote of thanks was given to the artistes.

The title of the lecture, "Psychology, and its Effect on Human Efficiency," had stimulated great interest, and there was a large number of members present. It immediately became apparent that Capt. Reid was a lecturer who was a master of his subject; his simple and lucid delivery giving to his hearers the full value of his address.

In Capt. Reid's definition of "rythm" as the ability to appreciate a coming stimulus, we recognised a condition very necessary to the individual as a means of producing truly effective work, while the control, which he states is so necessary to the physical and mental well-being of humanity, is a need fostered by the requirements, if not by the conditions, of modern life.

Slides were shown on the screen, and it was demonstrated, by means of the ubiquitous curve, the reactions of the individual to a variety of influences, and it was most interesting to note how a similar set of circumstances affected persons who differed temperamentally.

After the lecture points were raised by members of the audience, and a discussion followed. In answering, Capt. Reid mentioned that although involved controversies raged round scientific subjects, the basis of all scientific discovery is observation.

In conclusion, the thanks of all were conveyed to Capt. Reid for giving the Society the benefit of his vast experience as a student of industrial psychology.

* * * *

Contract Branch.

The volume of business done by the Contract Branch during the month of October showed a remarkable increase as indicated by the following figures:—

	Stations.
New business obtained	10,395
Ceasements	4,195
Net gain ...	6,200

The net gain is the highest on record and shows an increase of 1,016 stations on the figure for September and, what is still more gratifying, an increase of 528 on the previous record figure which was obtained in January, 1926. The figures for this month were as follows:—

	Stations.
New business obtained	9,747
Ceasement	4,075
Net gain ...	5,672

A number of amusing letters are addressed to the Controller from time to time, some of which illustrate the foreigner's difficulty with our language. The following is an example of this nature:—

"Dear Mister,

"I am veri sorry to have not participated a month before because I have known just now that I am obliged to change addres on Nov. 10, 1927. I pray you to procure to execute the removal in the shortest time possible.

I tank you feignedly,
Your faithfully,

The retirement of Mr. C. J. S. Livemore, First Class Contract Officer, has removed from the South-East Contract Office, an officer of considerable experience.

Mr. Livemore entered the Service of the National Telephone Co. as Wayleave Officer in 1904, became a Chief Contract Officer in 1910, and First-Class Contract Officer in 1912.

His unfailing good nature and genial disposition will be missed by his colleagues, who presented him with a cheque as a token of their esteem and goodwill.

* * * *

Football.

The game with the Treasury provided us with a runaway victory, the final score being 10 to none. The most pleasing feature about the result was the improvement in the play of the defence, and it must have been encouraging to the forwards, who have not been remiss in goal scoring, to retire from a game with a clean sheet. These runaway victories do not, as a rule, furnish the best games, and a far better contest was witnessed when the Colonial Office who, by the way, are the present leaders of the League, were entertained at Raynes Park. The result was a draw of 5 goals each, but when it is considered that at one period the L.T.S. lead by 3 goals to nil and later on in the game were leading by 5 to 3, it must be confessed that the final result was rather disappointing to the L.T.S. supporters. The Colonial Office recovered splendidly from the early reverses and came near to winning towards the end, when they showed the best football of the match. They are a fine team and should have a good season. It cannot be said, however, that our players are free from blame in permitting the visitors to snatch a point. The defence was weak under pressure and was guilty of bad tactics when holding a winning lead. These defects should, with a little more experience and understanding, disappear.

Two of our players, Messrs. Cowdray and Wilson, were selected to play in the League trial game, and hopes are entertained that further honours will be awarded the club.

Here is a list of fixtures to the end of the year:—

Nov.	19	... War Office	Home.
„	26	... Board of Education	Away.
Dec.	3	... „ „ „	Home.
„	10	... Ministry of Health	Away.
„	31	... War Office	Away.

For the benefit of Members of the L.T.S. Staff wishing to visit Raynes Park, it is pointed out that Teas are provided in the Pavilion of the Club's headquarters.

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Swimming Association Gala.

The ninth annual gala was held at the Pitfield Street Baths on Oct. 14. The interest in this event increases each year and on this occasion the attendance numbered 1,300. To the spectator it seemed that there were as many competitors as onlookers and, indeed, the entries for some of the events were remarkable. For the 33 yards handicap there were 138 competitors, and the team race for the Pounds Cup attracted an entry of 22 teams or 88 swimmers.

Apart from the competitive events the gala was notable on account of the demonstration given by Mr. E. H. Temme, the successful Channel swimmer, on how it was done. He was assisted by his trainer, Mr. T. Storey, and with the aid of a boat the method of feeding the swimmer was shown. The stroke demonstrated by Mr. Temme, who, by the way, is brother to the popular and energetic Secretary of the L.T.S. Swimming Association, was a powerful trudgeon at a rate of about 28 to the minute. Needless to say Mr. Temme received a great ovation from the audience.

Then there was the usual display of fancy and trick high diving by a team of A.D.A. divers.

Another event which was instructive and amusing was a display of life-saving by swimmers from Avenue Exchange.

Perhaps the most exciting event was the invitation team race in which a representative side from the London Banks, after a neck-and-neck struggle, beat an Insurance Office team by a touch.

A very good polo match between the Civil Service and Insurance Offices was won by the latter, 4 goals to 2.

Other results were :—

Learners' Race—"Agnes Cox Cup."

Miss Stevens (Park)	1
Miss Norden (London Wall)	2
Miss Dover (City)	3

L.T.S. Men's Team (Prossor Cup).

Automatic Section (Messrs. Gregory, Vincent, Porter and Bishop).

"Pounds Cup" Team Championship.

Regent (Misses House, Williams, Palmer, and Broomsgrove)	1
Victoria (Misses Amos, Bailey, Davis, and Drinkwater)	2
Gerrard (Misses Burt, Fairey, Hayter, and Wilson)	3

This was a very close race, and the noise created by the cheers of the supporters of the different teams beggars description.

The sealed handicap in connection with this race was won by Hampstead (Misses Martin, Turner, Hammond, and Payne), Lee Green being second and Primrose Hill third.

33 *Yards Handicap.*

Miss Watford (Park)	1
Miss Durling (Gerrard)	2
Miss Bennett (Paddington)	3
Miss Sumner (Museum)	4

Supervisors' Championship.

Miss L. K. Davies (Trunks)	1
Miss J. Davies („)	2
Miss Lloyd (Bishopsgate)	3

Diving Championship.

Miss McBirney (Trunks)	1
Miss D. Curnow (Holborn)	2
Miss H. Davis (Gerrard)	3

The Dance and Prize Distribution was held at Australia House on Nov. 18. During a jolly evening Miss Agnes Cox, who was presented with a fine bouquet by Miss Stevens, the winner of her cup, distributed the prizes. She commented on the fact that exchanges who had not previously competed were amongst the prizewinners this year, and she congratulated Regent on their fourth victory in the contest for the "Pounds Cup."

Mr. Pounds, the President and originator of the Association, referred to the large number of the staff who have learned to swim under the influence of the Association and he gave the number as 700.

SECRETARY'S OFFICE CRICKET CLUB.

A VERY successful Bohemian concert was held on Friday, Oct. 21 last, at which the "Leech" Cricket Shield was presented to the B. & S.B. and E.B. team, the winners of the Inter-branch Competition.

The members and their lady friends very much appreciated the talented efforts of their colleagues. Mr. W. J. Bale (Overseas Telegraph Branch (sang "The Toreador's Song" from Carmen and "Onaway Awake, Beloved," from the "Song of Hiawatha." His efforts were awarded by a hearty encore.

The Type duty provided a pleasing soprano in Miss Kelly and a rich contralto in Miss Vance.

Mr. T. Hanson, of the winning team, gave us a tasteful rendering of those well-known songs, "Take a Pair of Sparkling Eyes" and portions of the "Indian Love Lyrics." Mr. A. C. Jones, of the Traffic Section, excelled with skilfully played violin solos. The solo efforts of Messrs. John Whiffen and Arthur Hemsley, of the Traffic Section, were much appreciated, and their duet, "The Battle Eve," absolutely "brought down the house."

The humorous items by Mr. W. H. Oxlee, of the Staff Branch, provided that element of "gay abandon" which is expected on such an occasion. The eleventh hour presentation of a burlesque of "Julius Caesar" by the G.P.O. Players, some of whom are interested in the Mails Branch side of the Cricket Club, was a huge success, and the way certain incidents in the competition were brought in was admirable.

The concert ended all too soon, and those who were present gave expression to the sentiment that they had enjoyed a jolly good evening.

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THE

Telegraph and Telephone Journal.

VOL. XIV. JANUARY, 1928. No. 154.

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Subscription: To the public, 5s. 0d. per annum, including postage. To the Staff, 3s., including free delivery to any Post, Telegraph, or Telephone Office. Single Copies: To the Public, 4d. each, or post free 5d. To the Staff, 3d. each. Orders should be sent to the Managing Editor, TELEGRAPH AND TELEPHONE JOURNAL, *G.P.O. North, London, E.C.*1.

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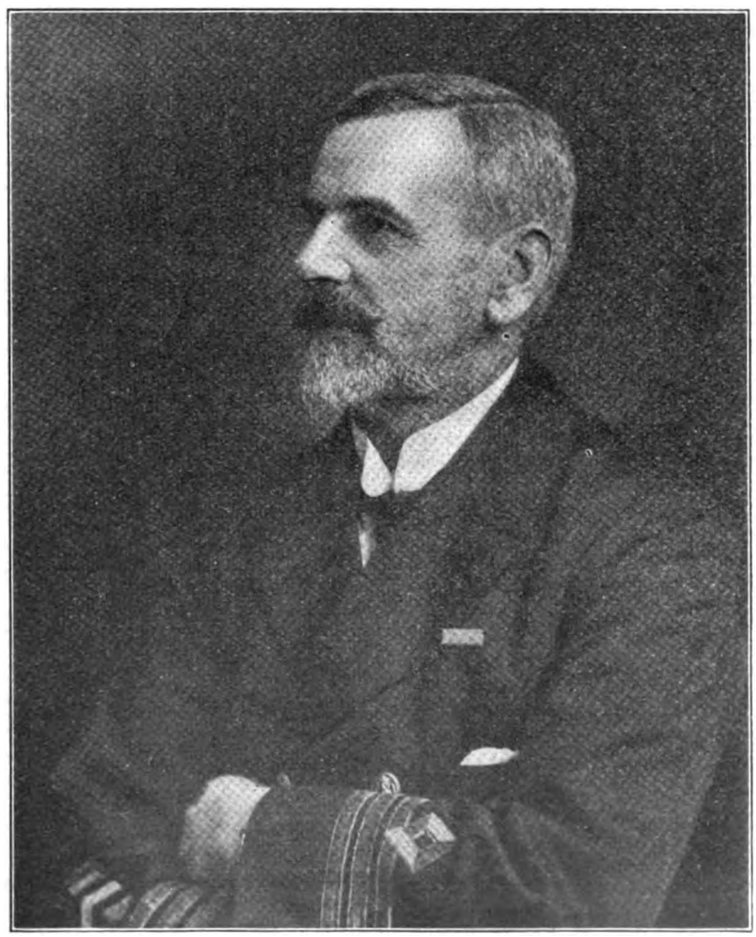
TELEGRAPH AND TELEPHONE MEN AND WOMEN.

XLVIII.

CAPTAIN H. F. BOURDEAUX.



[*Photograph by Lafayette.*

CAPTAIN BOURDEAUX, the subject of our sketch, is well known in telegraph and telephone circles as the Submarine Superintendent of the Post Office. He entered the service as 3rd Navigation Officer of the cable-ship *Monarch* in 1894, became Chief Navigation Officer of the *Alert* in 1903, Assistant Submarine Superintendent in 1912, and was promoted to his present post in 1922.

His father who was transferred from the Submarine Telegraph Company in 1889, became Submarine Superintendent. Captain Bourdeaux is therefore in the line of succession, and succeeded his brother in the post he now holds.

Captain Bourdeaux was in charge of various cable ships working under difficult and dangerous conditions during the whole period of the war, and during this time carried out important operations, details of which have never, and probably never will, be made known in a public journal.

He was awarded the O.B.E. and obtained special commendation from the Secretary and the Engineer-in-Chief for his exceptionally valuable work.

In 1919 he was delegated to select routes for submarine cables in the West Indies and subsequently accompanied the Cable Ship *Faraday* in the laying of cables between Barbados, Demerara, Trinidad and Turks Island. Needless to say Capt. Bourdeaux plays no small part in connexion with those Anglo - Continental telephone services which are now attaining such great importance. Moreover, the cable ships under his charge are always busy in one or other of the British seas, repairing the numerous telegraph and telephone cables which connect the mainland not only with neighbouring islands great and small, but also with the Continent.

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TELEVISION.

THE Bell System Technical Journal for October, 1927, contains a series of five technical papers on various aspects of the experimental demonstration of television over wire and wireless channels of the Bell system. The papers were presented originally as technical essays at the Summer Convention of the American Institute of Electrical Engineers, Detroit, Mich., on June 20-24, 1927; and they treat in considerable detail with the various difficulties which were met and overcome.

As the articles occupy over 100 pages of print, it is not practical to reproduce verbatim any description of the interesting research work; but our readers would no doubt be glad to learn something of the American developments in this intriguing side issue of the electrical communication services, i.e., the reproduction at a distance of moving pictures.

Television and its possibilities depend entirely on the retentive faculties of the living eye, and in order to present a single image from a series of telegraphic signals the lag between one signal and the next for each part of a moving picture must not be more than one-sixteenth of a second; and the problem therefore resolves itself into the possibility of accurately telegraphing the whole of the moving picture in that brief interval of time.

The photo-electric cell is the medium used for turning light and shade into electric signals. It is extremely sensitive to light, but as it must respond, for this purpose, to light reflected from the image it is necessary for the part of the latter which is being transmitted to be highly illuminated. Any general system of lighting with that object is impracticable in consequence of its harmful or disconcerting effects on a living being; and this difficulty has been overcome by the Bell Company by means of an ingenious method of spot lighting through fifty pin-hole apertures arranged spirally on a disc which is rotating at the rate of at least 16 times a second. Allowing for the interval between each hole, the spot light can only be on one part of the image for the short space of less than a two-thousandth part of a second, a speed which is not perceptible to the human eye, and therefore causes no inconvenience to the person under illumination. The reflection of this travelling light on the object causes variations in three large photo-electric cells mounted in front of the disc, one at each side and one at the top, and thus the light and shades of the object are converted into fifty lines of telegraphic signals. These three cells are claimed to be the largest photo-electric cells that have ever been made, each of them presenting an aperture of 120 square inches to collect the reflected light. So much for the transmitting apparatus.

The receiving apparatus is provided with a similar perforated disc which rotates in exact synchronism with the one at the transmitting station. The reproduced spots of light are viewed through a frame so arranged that only one of the pinhole apertures can pass behind it at one time, the lights and shades for each of the parallel lines being provided by the variations of a neon lamp at the back of the disc. The received picture is therefore a series of parallel lines with varying light travelling over the frame so rapidly that the human eye sees only a complete picture formed by the whole 50 lines at one time. Special arrangements are necessary for increasing the size of the picture so that it may be suitable for public exhibition in a hall. During the experiments transmission of living images was syschronised with speech, for which purpose the use of three transmitters was necessary, one of 50 kw., employed to transmit the speech of the person talking, one of 5 kw. for the transmission of the picture, and a third of 1 kw. to provide for synchronising the picture with the speech and the receiver with the transmitter.

In the case of transmission over wires the output was cut down to a low level so as to avoid causing interference and noise on adjacent wires in the telephone cable, the received signals being amplified in order to actuate the receiving apparatus. In the case of transmission by wireless, most elaborate arrangements were deemed necessary to secure freedom from interference and consequent distortion. The aerial tuning and coupling apparatus was housed in small buildings placed under the centre of each aerial, i.e., one for the picture and the other for the voice, the structure containing the picture aerial being provided with a copper roof connected with the earth system. The station building was not situated directly under either aerial, but a special shielded studio was constructed in one of the rooms of the station, and the walls, ceiling and floor of the studio were completely covered with sheet copper lapped over one inch and soldered. The windows were covered with copper gauze and the doors with sheet copper having a firm wiping contact with the door frame. Acoustic conditions were restored to the studio by fixing wall-board over the copper and covering the floor. The arc was mounted in a metal cabinet outside the room and all possible parts of the apparatus were shielded. The shielding and apparatus, where practicable, were earthed.

Those who have read the Press notices about other systems of Television will realise that the device for spot lighting is one of the main distinguishing features of the Bell system. That device may, in practice, prove only to be applicable to small objects reasonably near the transmitting apparatus, and its application to sporting events, such as horse races, boxing matches, &c., may present insurmountable difficulties. But whether that be so or not, the experiments form a substantial stage in the investigation of the problem of illumination for television purposes. It will be remembered that in at least one other system the same problem has been attacked with the aid of infra red rays.

J. W. W.

TELEPHONE DEVELOPMENT OF THE WORLD AT 31ST DEC. 1926.

BY W. H. GUNSTON.

THE following tables show the telephone development of the world during 1926 and of the principal countries and their largest cities. Compared with 1925, the total number of telephones increased by 1,549,000, of which increase 878,000 took place in North America, and 518,000 in Europe.

This total is distributed over the six continents thus:—

	Dec. 31, 1925. (Thousands.)	Dec. 31, 1926. (Thousands.)
Europe	7,475	7,993
Asia	912.5	963.5
Africa	165.5	188.5
North America	18,240	19,118
South America	402	432.5
Australasia	530	578.5
	27,725	29,274

The figures for 1925 have been adjusted slightly (*vide* article on last year's development in the *Journal* for Jan. 1927) in the light of later information.

Europe increased by only 518,000, as against 610,000 in the previous year, a falling off due to the fact that Germany's total increased only by 100,000 in 1926, as against 200,000 in 1925. Nevertheless, Europe increased at the rate of 7% as against North America's 5%.

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The figures in the annexed tables are those for the latest date (Dec. 31, 1926) to which it is possible to obtain information from the numerous administrations and other sources from which they are collected. In all essentials the figures are official, estimates being resorted to in an inconsiderable number of cases only. They are official for all the chief telephone-using States (Great Britain, the United States, Canada, Germany, France, Holland, Belgium, Scandinavia, Switzerland, Austria, Russia, Poland, Czecho-Slovakia, Australia, New Zealand, South Africa, India, Japan) and for numerous smaller States. For Mexico and South America, as also for some of the smaller countries, the figures are based on the previous year's official statistics. In a few cases, viz., China, Finland and the West Indies, the estimates are based on older figures.

The following table shows the number of telephone stations per 100 inhabitants of the chief telephone using countries at Dec. 31, 1926 :—

United States	15.6
Canada	12.7
New Zealand	10.0
Denmark	9.8
Australia	7.5
Sweden	7.4
Norway	6.9
Switzerland	5.3
Germany	4.3
Great Britain	3.4
Netherlands	3.2
Austria	2.4
Belgium	2.3
France	2.1
Argentina	2.0
Japan	1.7
Poland	1 0
Czecho-Slovakia	0.9
Spain	0.6
Italy	0.5
Brazil	0.3
Russia	0.2

This list contains all States possessing 100,000 telephones, with the exception of China, to whose 450 millions a total of 117,000 telephones stands in a negligible ratio.

EUROPE.

The annexed table (I) shows that there is one telephone to every sixty inhabitants of Europe. This figure, however, does not convey a fair impression of the development of Northern and Western Europe. In an area comprising Scandinavia, Germany, Austria, Switzerland, Holland, Belgium, France, Great Britain and Ireland, there are about 184 million people and about 6,756,000 telephones, a ratio of 27 to 1.

The principal increases in growth are to be found in Great Britain, 120,429 (8.7%); Germany, 100,479 (nearly 4%); France, 61,880 (11%); Russia, 34,583 (17%); Belgium, 17,374 (nearly 11%); Czecho-Slovakia, 16,468 (nearly 15%); Sweden, 16,052 (nearly 4%); Netherlands, 11,024 (over 5%).

The trunk line systems are in the hands of the State in practically all European countries except Spain. The local systems are operated by the State in almost all countries except Denmark (but in South Jutland there is a State system), Italy, Spain and Turkey. In Poland and Portugal the systems in the chief cities are worked by private companies. In Norway and Finland both the State and Private companies are in the field. In the Netherlands, the Amsterdam, Rotterdam and Hague systems are operated by the municipalities, and in the British Isles the Hull, Jersey and Guernsey systems are worked by the local authorities.

I.—EUROPE.

Country.	Population (thousands).	No. of Telephones.	Inhabitants per Telephone
Austria (152,757) ...	6,535	158,078	41
Belgium (156,307) ...	7,577	173,681	43
Bulgaria (8,531) ...	4,861	9,440	517
Czecho-Slovakia (113,767)	13,588	130,235	104
Danzig (17,707)	356	17,157	20
Denmark (311,570) ...	3,283	315,984	10.4
Esthonia	1,250	12,000*	104
Finland	3,402	87,000*	39
France (740,990) ...	39,209	822,870	47.5
Germany (2,588,016) ...	62,568	2,688,495	23.2
Great Britain (1,391,156)	44,173	1,511,585	29.2
Greece	6,800	5,500	1,236
Hungary (78,451) ...	7,482	80,183	93
Iceland	94	3,555	26
Irish Free State (23,112)	23,139	25,528	123
Italy	38,500	210,000*	183
Latvia 31/3.27 (18,411) ...	2,000	24,192	83
Lithuania (6,400) ...	2,000	6,818	294
Luxemburg (7,957) ...	263.8	8,350	32
Netherlands (215,928) ...	7,029	226,952	31
Norway (173,000) ...	2,649	174,500	15
Poland	13,000	135,347	96
Portugal (21,344) ...	6,399	21,850	293
Russia (206,795) ...	138,419	241,378	574
Rumania (41,675) ...	17,000	47,692	356
Serbs, Croats and Slovenes (26,778)	11,600	27,979	410
Spain (120,279)	21,658	134,860	160
Sweden (434,594) ...	6,036	450,646	13.4
Switzerland (200,211) ...	3,888	210,486	18.4
Saargebiet (17,688) ...	—	19,000*	—
Turkey (10,325) ...	2,000	10,907	183
	476,000	7,993,000	60

* Estimated.

The figures in brackets denote the number of stations at 31st December, 1925.

II.—ASIA.

	Telephones.
Ceylon	7,086
China	117,000*
Dutch East Indies (41,392) ...	43,329
French Indo-China	4,269
Federated Malay States	5,048
India (42,170)	47,624
Iraq (731)	825
Japan proper	636,727
Chosen (30,442)	65,000*
Formosa (12,637)	
Quantung (16,627)	
Saghalien 3,040	
Palestine (2,227)	2,695
Persia	3,547
Philippine Islands (16,966) ...	18,000*
Siam	2,000*
Straits Settlements (7,192)	
Penang, 1,691	8,213
Malacca, 483	
Singapore, 6,039	
Turkey in Asia (est.)	2,000*
	963,500

Population 1,013,000,000 or 1 telephone per 1,051 inhabitants.

* Estimated.

The total for China is based on an American estimate.

The telephone systems of Asia are, generally speaking, in the hands of the State. In India and the Dutch East Indies there are both State and private companies in the field. The systems of Persia, Turkey in Asia, Singapore, Shanghai and Hong Kong are operated by private companies.

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III.—AFRICA.

	Telephones.
Algeria (23,000)	24,060
Belgian Congo	400*
French Colonies	1,000*
Egypt (34,950)	36,778
Kenya and Uganda	1,782
Mauritius	1,098
Madagascar (1,254)	1,300*
Morocco (6,597)	7,000*
Nigeria	1,846
S. Rhodesia (1,981)	2,391
South Africa (78,571)	81,584
S.W. Africa	1,047
Tunis	8,167
	188,500

* Estimated.

Population 143,000,000 or 1 telephone to each 881 inhabitants.

These are all State systems, except that Durban (South Africa) has a municipal system, and Mauritius is operated by a private company.

IV.—NORTH AMERICA.

	Telephones.	Population (thousands).	Inhabitants per telephone.
U.S.A. (16,935,918) ...	17,746,152	114,430	6.4
Canada (1,144,095) ...	1,204,691	9,500	7.9
Mexico	58,000*	16,000	275
Cuba (62,114)	70,000*	2,900	41
Porto Rico (12,760) ...	13,000*	1,300	100
Other West Indies ...	4,000	3,500	—
Central America (20,014) ...	22,000*	6,000	273
	19,118,000	153,700	8

* Based on American official figures for 1925.

United States.—The total is made up of :—

American Telephone and Telegraph ("Bell") Company and Associated Companies ...	12,816,252
Independent companies in connexion with above system	4,758,000
Entirely independent	171,900
	17,746,152

The increase in stations over 1925 was 810,224 (or 4.8%).

The telephone service in North America is in the hands of private companies, except in Saskatchewan, Alberta and Manitoba (Canada) where the Provincial Governments operate the principal systems. There are also some small Government systems in Mexico, Central America and the West Indies.

Canada.—The total number of telephones was thus distributed amongst provinces :—

	Telephones.
Ontario	535,046
Quebec	246,138
Saskatchewan	102,148
British Columbia	101,915
Manitoba	71,369
Alberta	71,160
Nova Scotia	40,650
New Brunswick	30,294

The increase over 1925 was 60,596 stations or 5.3%.

V.—SOUTH AMERICA.

	Telephones.	Population (thousands).	Inhabitants per telephone.
Argentine (189,036) ...	205,000	10,087	49
Bolivia (1,824) ...	2,000	—	—
Brazil (102,984) ...	106,000	35,805	338
Chile (35,164)	40,000	4,655	116
Colombia (17,342) ...	19,000	—	—
Ecuador (4,518) ...	4,500	—	—
Paraguay (461) ...	500	—	—
Peru (11,000)	12,500	—	—
Uruguay (26,051) ...	27,500	1,678	61
Venezuela (12,035) ...	1,300	—	—
Other places (2,642) ...	2,500	—	—
	432,500	76,374	177

The figures in brackets are official figures for 1925 (from an American source). The figures for 1926 are estimated from them. The telephone in South America is almost entirely operated by private companies of which, except in Brazil, the principal are British.

VI.—AUSTRALASIA.

	Telephones.	Population (thousands).	Inhabitants per telephone.
Australia (384,563) ...	424,442	5,633	13
New Zealand (125,372)	132,089	1,320	10
Hawaii (18,804) ...	19,000	256	13
Other islands	3,000	700	—
	578,500	8,000	14

Australia.—The telephones are thus distributed amongst the States :—

	Telephones.
New South Wales	160,424
Victoria	133,218
Queensland	51,512
South Australia	45,391
Western Australia	21,981
Tasmania	11,916

The increase over 1925 is 39,879 or over 10%.

In New Zealand the increase (6,637) is over 5%.

The telephone service is operated by the State in Australia and New Zealand.

THE DEVELOPMENT OF THE LARGE CITIES.

Cities with 100,000 telephones and upwards :—

	No. of Telephones.	Population per Telephone
1. New York	1,502,376	4
2. Chicago	848,017	3.7
3. London Telephone area ...	519,969	14
3a (*London Adm. County*	401,902)	11
4. Berlin (Greater)	427,070	9.4
5. *Boston	405,599	4.3
6. Philadelphia	382,000	5.4
7. *Los Angeles	307,471	3.8
8. Paris	288,471	10.4
8a (*Paris and suburbs*	360,000)	17
9. *Detroit	272,562	5.7
10. San Francisco	229,935	3.1
11. *Cleveland	197,652	5.7
12. *Pittsburgh	191,697	4.9
13. *St. Louis	189,929	5.6
14. Toronto	163,744	3.9
15. *Montreal	150,681	5.6

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		No. of Telephones.	Population per Telephones.
16.	*Cincinnati	145,707	4.6
17.	Hamburg—Altona	142,979	9.7
18.	Washington	139,032	3.6
19.	*Kansas City	132,246	4.7
20.	*Copenhagen	130,675	6.2
21.	*Milwaukee	129,151	4.9
22.	Baltimore	122,197	6.5
23.	*Tokyo*	121,856	18
24.	Minneapolis	119,666	3.9
25.	Stockholm	111,487	3.5
26.	*Buffalo	111,348	5.4
27.	*Oakland	109,348	4.7
28.	Buenos Aires	104,281	22
29.	Seattle	103,595	3.8
30.	Vienna	101,410	18

* Including suburbs.

CITIES WITH 10,000 TELEPHONES AND UPWARDS.

Of these 278 cities, 166 are in North America, 84 in Europe, 10 in Asia, 8 in Australasia, and 4 each in Africa and South America. (41 are in the British Empire).

United States :—(The principal cities are mentioned in the foregoing list)	152
Germany :—(Berlin 427,070, Hamburg 142,979, Munich 63,306, Leipzig 58,928, Cologne 58,626, Dresden 52,505, Frankfurt (Main) 51,681, Breslau 37,649, Düsseldorf 38,157, Stuttgart 36,172, Hanover 31,641, Nuremberg 31,513, Bremen, Essen, Chemnitz, Mannheim, over 20,000; Duisburg, Dortmund, Magdeburg, Königsberg, Stettin, Elberfeld, over 15,000; Barmen, Kiel, Halle, Kassel, Aachen, Karlsruhe, Crefeld, München-Gladbach and Wiesbaden, over 10,000)	31
Great Britain :—(London 519,969, Manchester 50,254, Glasgow 47,649, Liverpool 48,349, Birmingham 39,642, Edinburgh 22,321, Leeds, Newcastle-on-Tyne, Bradford, Sheffield, Hull, over 15,000; Bristol, Cardiff, Belfast, Nottingham and Leicester over 10,000)	16
Canada :—(Toronto 163,744, Montreal 150,681, Ottawa 34,949, and Vancouver, Winnipeg, Quebec, Hamilton, London, Victoria (B.C.), Halifax, Edmonton and Windsor between 10,000 and 30,000)	12
France :—(Paris 288,471, Marseilles 18,990, Lyons 19,750, Bordeaux 13,074, Lille 10,811, Strasbourg 10,676)	6
Japan :—(Tokyo 121,856, Osaka 76,856, Kyoto 24,856, Kobe 24,642, Nagoya 21,629, Yokohama 13,456)	6
Australia :—(Sydney 94,812, Melbourne 80,301, Adelaide 27,385, Brisbane 20,122, Perth 12,575)	5
Switzerland (Zurich 28,451, Geneva 16,374 Basle 15,859 Berne 14 001)	4
Netherlands :—(Amsterdam 39,804, Rotterdam 33,833, The Hague 31,036)	3
Belgium :—(Brussels 60,324, Antwerp 25,485, Liege 12,064) ...	3
Sweden :—(Stockholm 111,487, Gothenburg 29,913, Malmo 15,416)...	3
New Zealand :—(Wellington 15,997, Auckland 15,957, Christchurch 10,290)	3
Russia :—(Moscow 54,936, Leningrad 47,150)	2
Spain :—(Barcelona 18,500, Madrid 17,800)	2
Italy :—(Milan 18,000, Rome 14,000)	2
India :—(Calcutta 12,377, Bombay 10,096)	2
Egypt :—(Cairo 14,813, Alexandria 10,348)	2
South Africa :—(Johannesburg 22,754, Cape Town 14,036) ...	2
China :—(Peking 41,000, Shanghai 24,000)	2
Argentina :—(Buenos Aires 104,281)	1
Austria :—(Vienna 101,410)	1
Brazil :—(Rio de Janeiro 35,871)	1
Chile :—(Santiago 10,568)	1
Czecho-Slovakia :—(Prague 30,345)	1
Cuba :—(Havana 42,860)	1
Danzig :—(Danzig 10,493)	1
Denmark :—(Copenhagen 130,675)	1
Hungary :—(Budapest 32,993)	1
Ireland, Free State :—(Dublin 14,005)	1
Latvia :—(Riga 11,215)	1
Mexico :—(Mexico City 30,700)	1
Norway :—(Oslo 40,872)	1
Poland :—(Warsaw 33,797)	1
Portugal :—(Lisbon 17,726)	1
Roumania :—(Bucharest 12,532)	1
Turkey :—(Constantinople 10,907)	1
Uruguay :—(Monte Video 15,589)	1
	276

TELEGRAPHIC MEMORABILIA.

A HAPPY NEW YEAR.

AUSTRALIA.—The question of Beam *v.* Cables was still vexing the public mind up to the time—slightly earlier than usual—that the *Journal* went to press. The skein is a tangled one, and better cannot be done for our readers than to place before them the published facts and points of view so far as they have come into our hands by the medium of the usual agencies, &c. Thus, the Canberra agency of Reuter's cables that "Mr. S. M. Bruce, Australian Commonwealth Prime Minister, has stated that he approved of the suggestion from London that the countries financially interested in the Pacific Cable Board should confer in view of the growing competition of wireless-telegraphy. The Ministry, Mr. Bruce added, considered that the competition between the 'beam' and cable services was not economical; the 'beam' system had taken 45% of the Pacific Cable Board's traffic."

On the 5th ult. the Canberra correspondent of the *Daily Telegraph*, London, cabled as follows:—

"Replying to a question in the House of Representatives in the matter of the position of the cable services in respect of the development of beam wireless, the Right Hon. S. M. Bruce, the Commonwealth Prime Minister said:

"The position of the cable services since the development of beam wireless is becoming acute and serious, and will be more serious if the beam system advances during the next twelve months at the same rate as it has during the last two months. The cables are vitally necessary for defence purposes as an adjunct of communication. As the matter is so serious it is proposed to appoint a committee of representatives of all the Governments concerned to meet in Great Britain and to examine the whole question. The representatives will make recommendations to their respective Governments. The appointments have not yet been made."

The new wireless agreement Bill submitted by Mr. S. M. Bruce, Prime Minister, to the House of Representatives, says Reuter, provides for the continuance of Commonwealth control over commercial wireless conducted by the Amalgamated Wireless Co., all charges being subject to the approval of the Commonwealth. The Company's patent rights are to be available for five years free of charge to wireless traders and broadcasting agencies; fees for listeners are to be reduced by 3*s.* 6*d.* to 24*s.* The Company has agreed to grant a licence free of royalty to every newspaper broadcasting station in the Commonwealth for the purpose of receiving official news from the British Government.

The Company is apparently waiving its present charges to broadcasters and listeners and receiving instead 3*d.* per month from the Government in respect of every listener's licence. The Company is to test the validity of its patent rights.

Reuter's Melbourne Trade Service states that: "Country listeners have often complained of the difficulties they experience in selecting sets suitable for the locality they are in, and 3LO is now considering equipping a special railway train to tour the country for the benefit of listeners. The train would carry a large variety of wireless sets and accessories, and be accompanied by experts, whose advice would be of great benefit owing to the distance from the cities."

New Short-wave Station.—On Nov. 21 the Melbourne station (3LO) commenced to conduct a regular Empire transmission for two hours every Monday afternoon from 4.30 Melbourne time (6.30 a.m. London time), using a wavelength of 36 metres.

At the end of June 1927, states the *Electrical Review*, some 2,797 persons were licensed as radio dealers, of whom 916 were in New South Wales, 1,024 in Victoria, 344 in Queensland, 335 in South Australia, 49 in Western Australia, and 129 in Tasmania, says the Royal Commission in its report, and evidence before it suggests that a number have no knowledge of the technical side of radio, and in at least some instances have sold sets of inferior quality. Under the present regulations, each dealer's representative who demonstrates a set for sale is bound to have a licence, for which the annual sum of £5 must be paid. The Commission is of opinion that when the employer himself holds a dealer's listening licence, he should be entitled to obtain further licences for his employees at reduced fees.

CHINA.—*World Radio* relates that in the spring of 1924 the Kellogg Switchboard & Supply Coy, of Shanghai, started to broadcast a daily regular programme and has continued to do so. It goes on to show how that although broadcasting and receiving in Chinese territories are not permitted on account of Government restrictions, the Kellogg Company's station was nevertheless instrumental in saving the lives of many missionaries and others during the recent outbreak of civil war. The number of radio users in Shanghai is estimated to be 10,000; the number of radio importers is placed at 15 and that of dealers at 25. Radio sets are either imported ready made, or are made locally of parts imported; prices range from 8*s.* to £150. Shanghai

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has three broadcasting stations, owned by the Kellogg Switchboard & Supply Co., the Kobe Electric Works, and the Shanghai Mainichi Shimbunsha, and each station claims to have a wavelength of 342 metres and power of 250 watts.

COCOS ISLANDS.—The British Chamber of Shipping has been notified that the radio-telegraph station on the island, which was closed on Nov. 30, 1926, has been reopened for the receipt and dispatch of private messages and distress calls.

FRANCE.—The *Financial News* says that the laying of the first section of the new Franco-American submarine telegraph cable, which is to cost Fr. 100,000,000 (about £800,000) was commenced at Le Havre, France, on Dec. 8, and completed Christmas Day. The first section will terminate at Newfoundland, whence a second section will follow on to New York. The French shore end was sunk by the cable-layer "Druge," but the "Colonia" will lay the deep-sea sections.

Broadcasting in France.—M. Bokanowski, Minister of Commerce, has laid demands for credit for development before the Finance Committee of the Chamber. The Minister proposes to create three "national," or main and 18 "district," or subsidiary, broadcasting stations. One of the national stations is to be at the existing school of telegraphy and telephony, whose transmitter will be developed accordingly. The other two national stations and the district stations are to be built with Government assistance and worked by private syndicates. The whole scheme is intended to be in working order within two or three years. The necessary funds will be obtained by raising the present tax of Fr. 1 on each receiving set, which is not levied effectively, and of which many listeners are not even aware, to Fr. 10 and by stiffening up the machinery for collection, says *The Times*. The Finance Committee has expressed the view that the national stations should be set up as soon as possible, and should be used to broadcast not only entertainment, but information useful to the rural population and weather reports. It is probable that existing private stations will eventually be acquired by the State.

GERMANY.—On the first of last month a public service for the telegraphing of pictures, documents, &c., was inaugurated between Berlin and Vienna at a minimum cost of eight marks. The special correspondent of the *Daily Telegraph* gives the following authentic particulars, &c. :—

Eight marks is the price of the transmission of a photograph of the dimensions of 3¾ in. by 1½ in. Every addition to the length adds a further two marks to the price. From nine in the evening until eight in the morning the charge is reduced by 20%. The maximum dimensions of telegraphable pictures are 7¼ in. by 3¾ in.

It is made known that, in addition to pictures in the ordinary sense, the service provides for the transmission in facsimile of drawings, plans, and written and printed matter of all kinds. The public is advised not to attempt to transmit yellow, blue or lilac, or to expect that a "picture telegram" delivered at the other end will show any other colours than black and white.

The *Electrical Review* says that the reported installation of a communal receiver at Frankfurt-on-Main extends the system of private relays which has already been widely adopted in Germany, with the approval (given experimentally) of the Reichspost, and in Darmstadt, plant capable of supplying many thousands of subscribers was initiated a short time ago. The method is to install central receiving apparatus and lay suitable lines to subscribers, who pay a monthly subscription fee of 4 marks, two of which (the ordinary broadcast licence fee) go to the Reichspost. The system is particularly well suited to new tenement buildings and settlements, adds *World Radio*, and many of the larger hospitals in Germany have adopted the system.

The British Department for Overseas Trade, in an interesting report on the Economic and Financial situation in Germany, in dealing with telegraph and telephone matters in that country, states that the number of telephones (main and subsidiary connexions) increased from 2,540,000 in 1925 to 2,640,000 in 1926; and the number of automatic exchanges was 221, with 143,000 subscribers. The telegraph is said to be increasingly superseded by the telephone so that the telegraph department shows an annual deficit of 40,000,000 marks. Two important cables were laid during the year. One was between Germany and Denmark, and the other between Germany and the Azores. The chief wireless connexions are with the United States, Argentina, China, Japan, the Dutch East Indies, Brazil and Egypt. The number of subscribers to the broadcasting system was 1,500,000 on Feb. 1, 1927, or an increase of 261,000 over April, 1926. At present 22 broadcasting installations are being carried on by ten companies. The transmitting apparatus at Koenigswusterhausen is to be replaced next year by one of five times greater capacity.

GREAT BRITAIN.—The results of the year's operations to Mar. 31, 1927. of the Pacific Cable are in brief as hereafter recorded and indicate that the receipts (£478,302) exceeded the ordinary working expenses by £178,284. After taking account of the annuity of £77,544 payable to the National Debt Commissioners in respect of interest and repayment of capital, a surplus of £100,739 has been devoted to the reserve and renewal fund in compliance with the provisions of the Pacific Cable Act, 1927. The *traffic* receipts (£467,063) exceeded those of the previous year by £13,467, due in part to the greater volume of traffic, but mainly accounted for by the circumstances that, owing to a carry-over from the previous year, payments received during the year under review from one of the connecting administrations in adjustment of traffic exchanges covered 13 months. The expenditure (excluding the contribution to the reserve and renewal fund) was higher by £21,030 than that of the preceding year. The expenditure from this fund during the year in connexion with the duplication of the cables between Vancouver Island and Fiji amounted to £2,131,308. The cable between Norfolk Island and Auckland was interrupted from Mar. 1 to 13, 1927, but did not involve any inconvenience to traffic. The duplication of the Board's cable system was completed during November, 1926. More than 12,000,000 words of international traffic (i.e., other than local messages between Australia, New Zealand, and the Pacific Islands) were transmitted across the Board's system, approximately 120,000 words above the total of the previous year, and established a further record. Ordinary, or full rate, international traffic fell off approximately 100,000 words, the loss being attributed to the attraction of the cheaper services. Week-end telegrams were less by approximately 130,000 words, the decrease being due to the reintroduction by the rival route of this service, which had for many years past been available only by the Board's route. There was an increase of approximately 40,000 words in Government traffic, 230,000 words in deferred ordinary, 60,000 words in Press, and 50,000 words in deferred Press, while the daily letter telegrams showed a reduction of approximately 40,000 words. In addition, approximately 3,700,000 paying words were carried between Australia and New Zealand and between those Dominions and the Pacific Islands, approximately 250,000 words in excess of the number handled during the previous year. On Feb. 1 the Board reduced its tariffs for telegrams exchanged between the British Isles and Australia and New Zealand, and corresponding reductions were made for traffic between Canada and Australia or New Zealand, as a corollary to the duplication of the system. The reductions were estimated to represent a sacrifice of approximately £27,600 per annum on the volume of traffic which was being handled at the time they were brought into force.

The *Daily Telegraph* adds that "in recording the completion of the duplication of the cable system the Board remark: The speed at which the new cables are capable of working surpasses all original anticipations. The capacity guaranteed by the contractors was 600 letters per minute, but the actual speed obtained during the tests was more than twice that figure, and it is anticipated that this could be increased should growth of traffic demand."

In the House of Commons.—On Dec. 5 last the following questions were asked and replied to as hereunder :—

Mr. A. M. Samuel, Financial Secretary to the Treasury, informed Sir Walter de Frece that the revenue of the Pacific Cable Board had undoubtedly suffered during the past year owing to the competition of the "beam" service and the lower rate charged. The Board was taking steps to effect economies in administrative expenditure, and experts were continuously engaged in improving the methods of working. The new cable was one of the most efficient in the world, having a capacity of about 1,200 letters a minute as against a maximum of about 260 on the old cable.

Mr. A M. Samuel informed Mr. O. Nicholson that the duplication of the Pacific cable was carried out between 1923 and 1926 at a cost of £2,641,000, which was met out of reserve funds. The Board made a working profit of £178,284 during the year ended last March, and, after paying £77,545 for interest and repayment of capital, devoted £100,739 to its reserve and renewal fund.

Sir W. Mitchell-Thomson, Postmaster-General, informed Mr. O. Nicholson that the total capital cost up to Mar. 31 last of the Rugby wireless station, including site, buildings and telegraph and telephone plant, was approximately £490,000. He estimated the present annual expenditure, including interest, depreciation and amortisation of capital, at about £123,000 and the annual revenue at about £57,000.

Viscount Sandon asked the Under-Secretary for the Colonies what were the communications as to wireless, cable and mails of the Falkland Islands; whether any steps were being taken towards their improvement; whether the installation of direct wireless communication with Great Britain or some part of the Empire could be undertaken; and what would the cost of this be?

Mr. Ormsby-Gore said that there was no cable communication with the Falkland Islands. Mails were transmitted in either direction by vessels of the Pacific Steam Navigation Co. and such other opportunities as occurred from time to time. As regards wireless communication, messages from the Government station at Stanley were relayed usually via the station at Cerritos in Uruguay. The Governor had recently submitted proposals for the establishment of a station capable of direct short-wave communication with the United Kingdom, at a cost which he estimated roughly at £3,000. Those proposals were being examined from the technical and the financial points of view.

The British Post Office Wireless Station, at Grimsby, known as Humber Radio, which is provided for communication with ships at sea, was transferred to Mablethorpe, Lincolnshire, on Dec. 6, and a continuous service day and night is now afforded. The name remains unaltered.

Commencing last month, time signals controlled by the standard clock in Greenwich Observatory are now to be broadcast from the Government's high-power radio-telegraph station at Rugby on a wavelength of 18,000 metres, concluding at 10 a.m. and 6 p.m.

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The B.B.C., which celebrated its fifth birthday on Nov. 15, inaugurated its short-wave station (5SW) at Chelmsford on Nov. 11. The aerial power will be between 15 and 20 kw., with a wavelength of 24 metres, and elaborate precautions have been taken to maintain constancy of frequency. The aerial is of the same type as the Marconi "beam" pattern, but has no screen wires behind it and so is non-directive. The oscillatory system is the standard Marconi one, but the modulator has been built up experimentally. It is explained by *World Radio* that the plant has been primarily installed to facilitate "two-way" experiments between England and America in conjunction with new reception methods and the Radio Corporation of America.

The 5SW programme was re-broadcast all over the U.S.A. and Eastern Canada, but in New Zealand and Australia attempts to relay it were not so successful owing to fading.

The Chelmsford Empire transmitter (5SW) commenced on Dec. 12 to transmit daily from 12.30 to 1.30 p.m. and from 7 p.m. until midnight, except on Saturdays and Sundays, on a wavelength of 24 metres. The National Broadcasting Co. of America, as well as organisations in the Dominions, will possibly relay some of the transmissions, which may last for some months. Chelmsford will relay the programmes of Daventry (5XX). (See also under U.S.A.).

It became known a week or two ago that a mobile transmitter with two masts and an aerial was touring the country in search of suitable sites for stations to be erected under the regional scheme under which the present 2LO station will be moved to a site north of London. The B.B.C.'s regional stations will serve: London and the South-East; the North of England; Scotland; Western England and Wales; and Northern Ireland. The mobile transmitter, it is understood, has already carried out tests in the Pennines and country just north of London, while engineers have made a rough survey of Wales.

The new aerial promised when "Daventry Junior" started work in August is now up, and engineers are testing the signal strength, but the new aerial will not be put into regular use at once as it has been found to suffer from screening in the direction of Birmingham. Recently 5GB's power was increased by 6 kilowatts to a total of about 24 kilowatts.

The British Government Radio Research Board's laboratory, test room, apparatus and a 200-ft. high lattice aerial mast at Ditton Park, near Slough, Buckinghamshire, England, were destroyed by fire on Dec. 1.

The number of radio broadcast receiving licences in force in Great Britain and Northern Ireland on Nov. 30 was 2,356,000, compared with 2,130,000 on the same date last year, an increase of 226,000. The number of free licences issued to blind listeners since the service was started at the beginning of the year is approximately 11,000.

The old system of illumination by incandescent gas burners in the lighthouses at Burnham-on-Sea, Somerset, England, has been successfully superseded by an electric and automatic one, the first installation of its kind. Trinity House made the change-over on Nov. 23 last.

"A night watchman employed on street works at Newton Abbot, Devon, fixes an aerial between the chimney of the road engine and the roof of his hut and listens to English and foreign stations."

The above paragraph has been very well advertised in the London and Provincial Press of the country, and the ingenuity of this *road-minder* deserves all the publicity it has received. It is hoped, however, that this lowly genius has duly made the necessary arrangement with the Licence Department of the G.P.O. Otherwise he may discover the drawbacks of publicity!

Figures published by the *Wireless Trader* show that the total value of exports of radio apparatus from this country during September was £95,892, including valves valued at £16,914. Japan was by far the most important customer, her share amounting to £30,047 (valves £7,697). Australia took second place with £12,880 (valves £3,437), and the Netherlands was third with £7,448 (valves £50). Other important customers were: India and Burma £7,795, France £5,261, and Italy £3,776.

GREECE.—The Government has decided to establish a broadcasting station in Athens, and relay plant at Corfu and Salonica is projected. Government regulations permit of the use of frame aerials only for reception.

HOLLAND.—Reuter's Amsterdam agent records that a new long-wave wireless station for European traffic was opened at Kootwjk on Nov. 21.

On Dec. 1 the Dutch Telegraph Administration completed its 75th year of Government Telegraph Service. The event was celebrated by the Administration and Supervision by the issue of a *Jubileumnummer* of the *Tydschrift voor Posteryen en Telegrafie*. This number is the 11th monthly issue of its 44th year and contains well over 60 pages of interesting matter, on the past, present and future of telegraphy, and is well illustrated throughout. There is an interesting symposium on "The future of Telegraphy," which includes many well-known names, each expressing his views in his own tongue, thus Monsieur Montoriol for France, Mr. Creed, Mr. Murray and last, but not least, Mr. Archibald, for Great Britain. Dr. Lüschen writes for Germany, while R. De Boer for the Dutch gives both the pessimistic and optimistic views of the by-and-bye and seems to come down heavily, as one would have expected, on the latter side.

Un chanson au Baudot is reproduced *in extenso* from the *Cable Room Chronicle*, London, a compliment which will be much appreciated by the Cable-ites.

The Dutch Postmaster-General has issued a *communiqué* in which he says he has obtained excellent results with short-wave radio-telephony between Holland and the Dutch East Indies, and that, if results can be maintained, regular telephone communication between the Netherlands and its Colonies will be assured.

HUNGARY.—On the 6th ult. Reuter, wiring from Budapest, stated that the Budapest Prefecture of Police has decided to install at headquarters transmitting and receiving apparatus for the despatch and recording of pictures sent by wire. Smaller sets will be provided for the various district stations.

INDIA.—Experimental short-wave transmission is to be undertaken in order, if successful, to enable the two existing stations' transmissions to be duplicated on both short and long waves, says *World Radio*, so as to give listeners who live beyond the normal range of the present 3-kw. transmitters a chance of using smaller and cheaper receivers than is at present possible. Such development may increase revenue sufficiently to permit of the erection of further normal-wave stations.

As the special correspondent of *The Times Engineering Supplement* stated when cabling from Calcutta at the early part of last month: "Broadcasting is making slow progress, and will reach its full development only when 'Empire broadcasting' becomes something more than a newspaper headline. Consequently the demand for wireless instruments remains on a limited scale, British suppliers commanding most of the trade. The main trouble of the Indian broadcasting company, which at present has stations only at Bombay and Calcutta, is the smallness of the area in this vast country which is open to reception on small and cheap sets.

"Plans, however," the company announce, "are proceeding for development on original lines, and should these prove practicable, there appears no reason why all India and countries beyond as well should not be able to receive one or other of the stations, and a large part of it both stations, on comparatively small, simple and cheap sets.'"

IRISH FREE STATE.—When members of the wireless trade dined together in Dublin recently, the speakers urged the removal of the duty on imported components and materials of the trade, the contention being that, as there was no industry to protect at home, the imposition of the tax was for revenue purposes only.

It is understood by the *Electrical Review* that it is contemplated to discontinue the direct telegraph line from London to Waterford, and that in future cross-Channel messages will be relayed via Limerick, Cork or Dublin. It is also understood to be a question of the upkeep of the cable between Rosslare (Wexford) and Fishguard (Wales); the direct line will only continue henceforth to and from Waterford up to 4 o'clock in the afternoon, and messages between London and Waterford after that hour will be sent by the longer indirect route.

NORWAY.—It is reported that the Bergen station will commence duplicating its transmission shortly, if it has not already done so by the time these lines are in print, on 30 metres, in addition to its normal wavelength of 370.4 metres.

In an endeavour to improve cable telegraph communication between Norway and London, says Reuter's Oslo agent, the Norwegian Government has decided to exchange with Great Britain two telegraph officials for a month, with a view to the mutual study of conditions in the two countries.

PHILIPPINE ISLANDS.—Day and week-end radio letter telegram services, via Marconi, were recently inaugurated to the Sandwich and Philippine Islands.

POLAND.—The new transmitting plant at Kattowitz, which has been recently tested nightly on 422 metres, should by this month be in full operation.

As a result of the development of communication by telephone, the use of the telegraph service is declining in Poland as in other countries. The Ministry of Posts and Telegraphs is consequently laying this year only an insignificant number of new telegraph lines; they will reinforce the present telegraph systems between Warsaw and Gdynia, Warsaw and Posnan (Posen) and Posnan and Cracow, via Katowice.

SOUTH AFRICA.—When the African Broadcasting Co. took over the services there were 11,000 licensed listeners. To-day the total is more than 14,000; "piracy," however, continues, and another attempt is shortly to be made to deal with it. Now that the African Co. is broadcasting throughout the whole of the Union, developments may be expected, says *World Radio*. A new station is to be erected in Johannesburg, and it will contain a 20-k.w. set, against the ½-kw. set now doing duty, and should be in operation about Mar. 6, 1928.

SPAIN.—A return relating to the activities of the Spanish Telegraph Department during 1925, which has lately been issued, shows that the number of telegraph offices in the country declined from 3,394 in 1924 to 2,944, and the length of the telegraph line in use from 35,272 to 31,780 miles. Although the number of messages dealt with increased from 14,608,369 to 15,737,479,

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there was a falling off in the receipts from 25,127,557 pesetas in 1924 to 19,507,087 pesetas in 1925. The service is apparently run at a loss, the return showing that the cost of operation and maintenance amounted to 44,493,324 pesetas, as against 48,833,512 pesetas in the earlier year.

SWITZERLAND.—The correspondent of the *Daily Telegraph* reported from Geneva that at one of the public meetings of the Council held last month a considerable time was occupied with the report on the Conference of Press Experts held in Geneva last August. On the report of the Cuban representative, the Council decided to draw the attention of the Governments to the resolutions of the Conference which called for official action. A letter from the International Association of Journalists accredited to the League of Nations was presented by the Secretary-General to the members of the Council regarding the question of direct telegraphic communications between Geneva and London, which for a long time have been under consideration and have recently become particularly acute, as communication between Geneva and London has been found distinctly inadequate, resulting frequently in delays of as much as six hours. It is pointed out how communications between London and Geneva are of widespread importance, London being not only a receiving point for information concerning the League, but also the retransmission station for the British Dominions, the Far East, and North and South America. The Association of Journalists asked whether it might not be possible for the Council to arrange that the organisation for communications and transit should study this problem and bring about a meeting of experts belonging to Switzerland, France and Great Britain. Sir A Chamberlain informed the Council that immediately he returned to London he would consult the Postmaster-General and, so far as Great Britain was concerned, they would do their utmost to bring about an improvement in communications, the necessity of which was endorsed by all the members of the Council.

It is also reported that the wireless apparatus required for a new wireless station is now being manufactured in the Marconi works at Chelmsford, and the masts and accessories are under construction in Switzerland. The Swiss Marconi Company will be in a position to open the new station near Geneva for traffic in the spring of 1928.

It is with the deepest regret that we learnt through Reuter's Berne agency on the 16th ult. of the unexpected death of Henri Etienne, director of the International Bureau of the Telegraphic Union. This most respected officer of the Union, whose signature is probably known in telegraphic circles all over the world, was returning to Europe from the International Radio Conference in Washington and actually died on board ship from *angina pectoris*.

U.S.A.—At least 22 American stations have installed short-wave transmitters (using different call signs to those of their parent stations) for the purpose of relaying programmes.

The value of exported radio apparatus from the United States during 1926 amounted to £1,758,890, according to the Department of Commerce. Over 50% was for North and South American countries. The total export value dropped £220,000, or 11%, in 1926, due largely to the decrease of exports to Canada. North America took 20% less in 1926 than in 1925, South America increased its purchases 21% in 1926 over 1925 and 39% in 1925 over the preceding year.

The National Broadcasting Company of America has notified the Federal Radio Commission that it intends to endeavour to establish systematic international broadcasting at the earliest possible date. The first interchange of programmes is planned between the United States and Great Britain, and in the United States it is intended to operate between the hours of 7 and 11 in the evening, e.s.t., throughout the year. Experience has shown that two short wavelengths at least will be required to enable British reception of American programmes. The transmitter will deliver approximately 20 kw. of power, modulated telephonically, and will be installed at Bound Brook, N.J., in the same building as the present broadcast transmitter of W.J.Z. The programmes will not be broadcast to the public, but addressed to the British Broadcasting Corporation's corresponding receiving station in England, and regarded as a point-to-point service. It is possible that commercial arrangements relative thereto will be worked out and, in any case, the programme will not be available for rebroadcasting purposes, except by those to whom it is addressed. According to *World Radio*, the purpose of this restriction is to make certain that rebroadcasting shall be conducted by responsible agents capable of giving good service to the public abroad, and in such efficient manner that a fair idea of the nature and quality of American programmes can be gained by the public in foreign countries. The two wavelengths desired for the purpose are 27.207 metres (11,020 kilocycles) and 18,715 metres (16,020 kilocycles). The first is within a band already assigned for relay broadcasting, and the second within a point-to-point service band. (See also under GREAT BRITAIN, *re* 5SW.)

The following items regarding the late Radio Conference held at Washington, are condensed from communications cabled by Reuter's special agency in that city :—

The International Radio Conference at Washington adjourned on Nov. 25 after ratifying the new Wireless Convention, which will come into force on Jan. 1, 1929, and will remain in force for a period of five years. The convention was signed by 79 nations and territories.

Some time must elapse before the recommendations of the Conference are published. The matters of chief interest have proved to be the allocation of waves to the various services and the regulations for the gradual supersession of spark sets at sea. As regards the former, we understand that the principal changes from the band for long-range c.w. work will extend from 1,875 to 3,000 metres, the part between 2,000 and 2,400 being reserved for the use of stations which work with ships. As regards the latter, we understand that i.c.w. sets are to be substituted for spark sets in ships as opportunity occurs, and that it is stipulated that no spark sets must be in commission by 1940. The policy already entered upon in this country of having auto-alarm receiving apparatus in ships as a substitute for watchers has been agreed to in general by the Conference.

The regulations laid down by the last International Conference, which was held as far back as 1912, are, of course, quite inadequate for present conditions, so that the Conference has had to deal with an enormous amount of work in framing up-to-date regulations. Various arrangements have, however, grown up internationally by mutual consent during the last few years, and it will be found that, in the main, the arrangements already in use have been made the basis of the new regulations. Point-to-point working, which was not dealt with by the 1912 Conference, has been catered for in accordance with present practice, the longer waves allocated for this service being from 2,725 to 30,000 metres. Broadcasting requirements are, of course, also new ; 1,340 to 1,550 metres will be available in Europe only for the longer-wave broadcasting stations, but they will be able to use also a band between 1,550 and 1,875. Both bands will also be available for other services. The shorter broadcast band will, we understand, be 200 to 545 metres, which is larger than that at present available in this country, but it includes the band of 200-330 metres which will be used for communication between small ships in place of the 300-metre wave of the 1912 Convention.

A distress call for use in radio-telephony, which will be the exact equivalent of the S.O.S. in telegraphy, has been adopted by the Conference and incorporated in the new International Wireless Convention. The new code is " Mayday," to be spoken through the broadcasting apparatus, and followed immediately by details. " Mayday " is the phonetic spelling of the French " M'aider " (help me).

The Conference has fallen into line with the British Air Force, which some time ago officially adopted the words " May Day " as a signal to be given by aircraft in distress.

The Belgian delegate stated that his Government had expressed its willingness to hold the Telegraph Conference in Brussels next year instead of in 1930.

With regard to short-wave developments, the *Electrical Review* has a lengthy and very interesting paragraph in their issue of the 16th ult. regarding the G.E.C. of America, thus : " In its pursuit of knowledge of short waves, the General Electric Co. of America has developed a 5-metre transmitter wherewith propagation tests will be conducted. Apparently the signal follows a straight unobstructed line : a receiver on a hill will pick up a strong signal, but the same receiver, when placed on the other side of the hill, so that it is not within the ' line of vision ' from the transmitter, will get a barely audible signal. Natural static was absent from the tests made, but man-made static, such as that from the ignition systems of automobiles, was very noticeable ; thus far the transmitter has been tested only thirty miles away. Extremely high frequencies are involved, a five-metre wave representing approximately 60,000,000 cycles per second, and the 1-kilowatt transmitter is constructed so that it can be elevated and swung from one of the 300-ft. masts at the transmitter laboratory at South Schenectady. Two new-type, four-element, air-cooled valves are used in the special oscillator circuit ; the antenna is about 8 ft. long, and consists of a half-wave radiator, voltage fed, connected directly to the oscillator. A meter in the middle of the antenna is used for measuring the antenna current, which is read by means of a surveyor's transit on the ground. Tuning the transmitter is made possible by a rope drive connected with a ' vernier ' control ; wires for supplying power and control are run to the transmitter from the ground. The portable five-metre receiver used consists of a regenerative detector and one audio amplifier ; the grid tuning coil consists of five turns of wire 0.5 in. in diameter ; the ' tickler ' coil is 0.25 in. long and 0.25 in. in diameter, and it is inside of the grid coil. Very small condensers located close together are used for tuning and regeneration control, and special low-capacity valves are used. Generally, it is unnecessary to use any antenna, the telephone cords picking up sufficient energy ; an antenna may, however, be used.

WEST INDIES.—The report of the Pacific Cable Board for the financial year ended Mar. 31, 1927, on the working of the submarine cable system and radio-telegraph stations in the West Indian Islands and British Guiana shows that the receipts amounted to £50,412. The Board reports that the business of the telegraph system showed a consistent growth throughout the year under review. The number of words handled during the year totalled 1,379,769 (including 57,310 words in telegrams exchanged with ships at sea), as compared with 1,085,178 (47,206 words in ships' telegrams) during the preceding year ; traffic receipts (£49,914) exceeded those of the

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previous year by £11,545. The net expenditure (£33,581) was £418 in excess of that of the preceding year, which was accounted for mainly by contributions to the staff provident fund which was instituted during the year under review. The surplus of receipts over net expenditure amounted to £16,831, as compared with £6,010 during the previous year; £10,831 was available towards meeting the annuity of £23,922 payable to the National Debt Commissioners in respect of interest on, and repayment of, advances of capital for laying the cables, installing the wireless stations and equipping the system; the deficiency to be made good by the contributing Governments was therefore £13,090. No interruptions occurred, with the exception of St. Vincent, where transmission was suspended from June 23 to 27 owing to a breakdown of plant.

As these lines are penned the year of 1927 is drawing fast to its close and the outstanding feature of the telegraph world is pre-eminently Beam *v.* Cable. As I write with the latest weekly review of cable and wireless stocks and shares before me this is what I read: "It cannot be said that the cable group is particularly happy, although the severity of the slump has been stayed, and there was a little bargain-hunting on the part of speculative investors. The Eastern Company, pressed to make a statement on the subject of cable and wireless, replied that it would be improper to do so in view of official assurance that the Post Office would be in a position to deal, before the end of the year, with the situation placed in front of them. Eastern ordinary stock is normally unchanged at the extremely wide price of 145-155 but has changed hands down to 143. Eastern Extensions have dropped 15*s.* to 14¾*s.*, Globes 10*s.* to 15*s.*, and the preference 7*s.* 6*d.* to 10½, while Westerns at 14 xd. are about the same as they were. Anglo-Americans are flat at 96 for the preferred and 24 for the deferred. Indo-Europeans maintain their position at 40, but Great Northerns weakened to 37¼. Marconis continue to be a firm market at 31*s.* 3*d.*; the price has been up to 32*s.* 6*d.* A boomlet occurred in Canadian Marconis, the price being run up to 11*s.* 3*d.* (comparing with 6*s.* 6*d.* at one time last month) before reaction lowered the quotation to 8*s.* 9*d.* on a statement from the chairman, at Toronto, that 'there is no prospect in sight warranting the trading in the shares.'"

Perusal of reports from many administrations abroad also tells a tale of reduced telegraph receipts against telephone competition, which might shake one's faith in the future of telegraphy altogether if it were not for the long view on such a subject. The day for very short-distance telegraphy has no doubt gone, but the longer distances should find the telegraph still well to the fore, despite the telephone, high-speed motors or aeronautics!

The French news, above, shows that there are still experts who have faith in cables, while the following abridged report of the Western Telegraph Co., Ltd., emphasises once again the feature of secrecy which is claimed for underground and submarine cables. One thing is certain, the last move on the chess-board of telegraphy is a long way off yet.

The annual meeting was held on Nov. 24. Sir John Denison-Pender, G.B.E. (chairman) presided, and in presenting the report said that there was a decrease of £208,422 in the revenue. The actual decrease of message receipts, the main source of revenue, however, was slightly more than that figure, namely, £216,669, but there was an increase in respect of sundry other items. On the other hand, there was a reduction of £11,377 in working expenses, and they looked forward to further reduction in expenses when the effects of a new system of working made themselves fully felt. In the circumstances the result of the year's working could not be considered unsatisfactory, as they had been able to maintain the dividend. They had purchased a site for new offices at Rio de Janeiro; the value of property in the capital of Brazil was now not far short of that in London.

They were half-owners with the Eastern Telegraph Co. of a subsidiary company, the working of which they both found could be more economically carried out by its being absorbed, and as that company lay in the Eastern Company's sphere, it took over the working. They divided the greater part of the liquid reserves, and the company's share was £206,500. The decrease in revenue was due to competition, depression in trade, and the fall in Brazilian exchange. Every opportunity had always been taken by the company to improve plant and the carrying capacity of cables, and this year had seen perhaps the most important advancement of recent years, the installation of the latest invention for rapid and accurate transmission at all the main line stations. By means of this new apparatus, not only was direct transmission from point to point achieved, but speed was accelerated, and accuracy was further assured. They now worked directly between all the principal centres such as London and Buenos Aires, London and Rio de Janeiro, and, in conjunction with the Western Union Telegraph Co., between New York and those South American cities. Last year he had made it clear that with the number of telegraph companies competing in South America, in bad times there might not be sufficient traffic to go round and give satisfactory returns to the shareholders of those companies not fortunate enough to have financial Government support. In addition to the cable companies they had as competitors two comparatively recently started wireless companies, the Transradio of Argentina and the Brazilian Company. Since the introduction of the beam system between England and the remote portions of the Empire a great deal had been written concerning the effect it might have upon the cable companies.

But there had been no sign of doubt as to the security of transmission given by cables. It was by means of tariffs that the radio became a competitor of cables. Since Aug. 1 last the rates had been the same for both means of communication. Three months had passed since their international traffic had been carried at the reduced rates, and there had been a marked improvement in words carried, and, so far, the tendency was for it to increase. The cash receipts at the lower rates now in operation could only be made up by increased activity in commerce. His opinion remained confirmed that the cables gave the most accurate, secret and speediest means of communication, and were absolutely essential in certain circumstances, but he had no hesitation in saying that the co-operation of the two means of communication should be brought about in the interests of the Governments, the public, and the communication companies themselves.

A quarterly dividend of 5*s.* per share, free of tax, has been declared in respect of the current year.

The eighteenth annual exhibition of Electrical, Optical and other Physical Apparatus is to be held by the above Societies on Jan. 10, 11 and 12, 1928, at the Imperial College of Science and Technology, South Kensington.

From the Post Office to the Bar!—During the hearing of a case at the Old Bailey Sessions the Recorder congratulated Mr. A. E. McCloskey, the prosecuting counsel, on the masterly way in which he had marshalled the facts of the case in his address. Before going to the Bar Mr. McCloskey was an electrical engineer for thirty years on the staff of the G.P.O., London, and his services were loaned by the P.M.G. to the Governments of India, Ceylon and the Irish Free State.

At an informal meeting of the I.E.E. on Monday, Nov. 21, with Mr. J. R. Bedford in the chair, Mr. W. Day opened a discussion on "Automatic Telephony." He said that the manual telephone was definitely limited by the bulk of its multiples, the increase in the number of exchanges with the consequent slowing down of working, less reliability, and dearer plant. Another difficulty was the recruiting of the right type of operator to meet the intensified conditions. He then briefly reviewed the alternative systems, and explained with charts and lantern slides the route and apparatus of the "director" or step-by-step system recently put into commission at the Holborn exchange. He said that the difficulties of the subscribers in this area would rapidly vanish, and that familiarity with the apparatus would ensure successful functioning.

Mr. Gerald Marcuse, the British amateur, whose station 2NM anticipated Chelmsford in Empire broadcasting, expressed qualified approval when the *Daily Telegraph* wireless correspondent read to him Washington's list of amateur wavelengths. Unless a special concession could be obtained from the British Post Office, he pointed out, it meant that the wave he had most successfully used for broadcasting to Australia (32.5 metres) would have to be relinquished. Another difficulty which he foresaw lay in the possible use of crude methods of transmission by some Continental amateurs. Two or three might conceivably blot out the whole of a narrow band in the coveted short-wave region.

It is announced that Messrs. Isaac Pitman & Co., Ltd., are publishing immediately the survey of "The Cable and Wireless Communications of the World," which has been written by Mr. F. J. Brown, C.B., C.B.E., late Asst. Secretary, G.P.O.

Broadcasting has, to some folk, already become an ancient recreation, and by such is possibly even ranked with the commonplace.

One wonders whether the statement made by Miss Mildred Cable, missionary, the author of "Through Jude Gate to Central Asia," before a gathering of the School of Oriental Studies, would give these same folk just one new thrill of this now every-day marvel! Said Miss Cable, who herself has crossed the Gobi desert by a Central Asia route never trodden by a white woman before: "The Kazaks, the wild Tartan people of to-day, informed me of the details of our coal strike and quoted the names and politics of our political leaders, having gained this knowledge by means of wireless, which now connects their remote land with the greater world."

In a letter from a relation resident in Montreal there appears these few words: "We listened in to your Armistice Concert at the Albert Hall and got it splendidly. The Prince's speech, too, was as clear as it was when we heard him here in Montreal." It is perhaps the personal touch that affects one in a case like this, but nevertheless the wonder of it seems to grow upon one. Shall I be believed if I say that the thrill of being in instant touch with the humanity at the other end of an ordinary telegraph circuit is still not entirely quenched—after, in round figures, four decades?

Congratulations to Mr. Cobley, Asst. Supt., Cable Room, who retired on Nov. 26 last, upon reaching the age-limit. "George" was always a popular supervisor and his geniality will no doubt be missed by many. With his many activities and interests in life our old colleague is not likely to suffer from ennui. That his retirement may be a long and happy one is the wish that surely follows him.

Hearty congratulations also to Messrs. B. F. Ward and Wall upon their promotion to the vacancy and sequent vacancy respectively.

Leisure.—The advantage of leisure is mainly that we may have the power of choosing our own work, not, certainly, that it confers any privilege of idleness.—"The Value of Time," Lubbock.

J. J. T.

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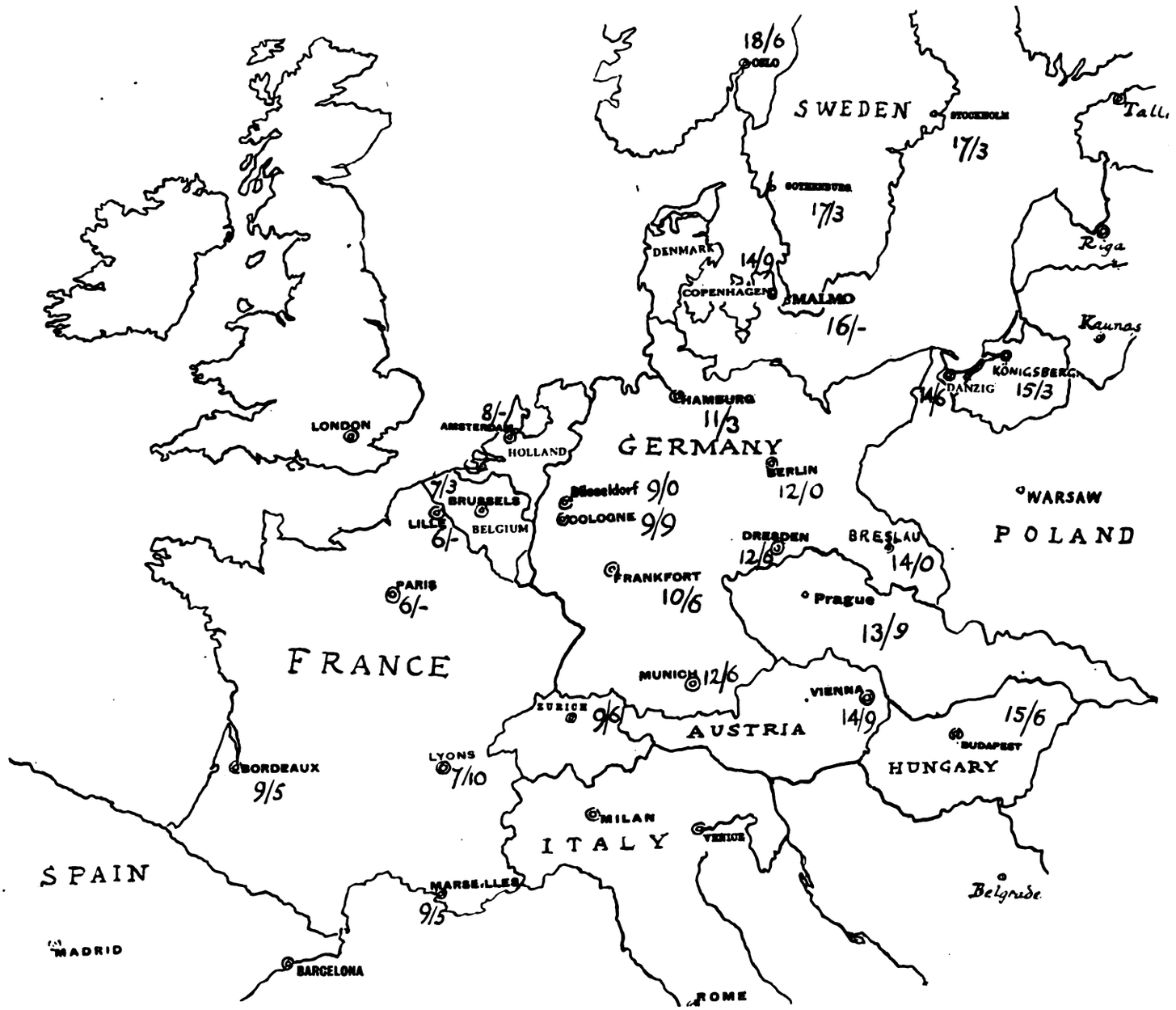

ANGLO-CONTINENTAL TELEPHONE SERVICES.

Map shewing the principal European countries which are in telephonic communication with Great Britain and the charges for a day call of 3 minutes from London to the principal towns in such countries. Those countries in which no figures are inserted are not yet in telephonic communication with any place in Great Britain.

PROGRESS OF OVERSEAS TELEPHONE SERVICES IN 1927.

Jan. 7 ... Transatlantic telephone service inaugurated between London telephone area and New York and its suburban area.

„ 15 ... Transatlantic service extended to whole of New York State.

„ 29 ... By this date transatlantic service had been extended to cover communication between any place in England and Wales and the States of New York, Maine, New Hampshire, Massachusetts, Vermont, Rhode Island, Connecticut, New Jersey, Pennsylvania, Maryland, Delaware and District of Columbia (1st American zone).

Feb. 15 ... Transatlantic service had been extended by this date to whole of Gt. Britain, and to Ohio, Indiana, Michigan, Illinois, Wisconsin, Virginia, West Virginia, Kentucky, Tennessee, North and South Carolina and Georgia (2nd American zone).

„ 19 ... Transatlantic service extended to Missouri, Kansas, Arkansas, Oklahoma, Louisiana, Mississippi, Alabama, Florida, Iowa, Nebraska, North and South Dakota and Minnesota (3rd American zone).

„ 21 ... Transatlantic service extended to Montana, Wyoming, Idaho, Colorado, Utah, New Mexico and Texas (4th American zone).

„ 26 ... Transatlantic service extended to Washington, Oregon, California, Nevada and Arizona (5th American zone).

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Mar. 11	...	Transatlantic service extended to Cuba.
May 5	...	Direct London—Geneva circuit formed, providing first through circuit to Switzerland. Converted to a London—Zurich circuit, May 25.
„ 7	...	New Anglo-Belgian submarine telephone cable brought into use and 5th Brussels circuit provided. 4th Antwerp circuit provided on May 18.
„ 15	...	Anglo-Belgian charges reduced and night rates and British zone system applied to this service.
June 22	...	Anglo-Swedish service from 3 p.m. to 8 a.m. inaugurated (confined to communication between London and Stockholm).
„ 24	...	Anglo-Swedish service made continuous.
„ 29	...	Service between London and Provinces and Free City of Danzig inaugurated.
July 15	...	Anglo-Danish service (confined to London and Copenhagen) inaugurated.
Aug. 10	...	Anglo-Swedish service extended to the Provinces in this country and to Gothenburg.
Sept. 5	...	London—Geneva circuit provided. Converted to a London—Basle circuit on Oct. 5, forming the 2nd Anglo-Swiss circuit.
Oct. 1	...	Anglo-Norwegian service (confined to London and Oslo) established.
„ 3	...	Transatlantic service extended to Dominion of Canada. Service confined to communication between London and Ottawa, Quebec, Montreal, Toronto and Hamilton.
„ 12	...	Anglo-Swedish service extended to various places near Stockholm and Gothenburg and also to Malmö and Helsingborg.
„ 27	...	Anglo-Swiss service extended to all principal towns both in this country and Switzerland.
Dec. 1	...	Anglo-Austrian service opened between London and Vienna.
		Anglo-Swedish service extended to whole of Sweden.
		Service to Denmark and Norway extended to the Provinces in this country.
		Anglo-Continental rates to Germany, Holland, Sweden, Norway, Denmark and Danzig reduced by about 20%-25%.

During December also arrangements were completed for opening an Anglo-Czecho-Slovakian service to Prague, and an Anglo-Hungarian service to Buda-Pest on Jan. 1, 1928.

REVIEWS.

"Wireless Direction Finding and Directional Reception." By R. Keen, B.Eng., A.M.I.E. (Second and enlarged edition. Published by Iliffe & Sons, Ltd., Dorset House, Tudor Street, E.C.4. 490 pp. Price 21s. net.)

The subject of wireless directional reception has in recent years become one of the most important sections of the practical application of Hertzian waves. Directional reception is used to enable unwanted electrical oscillations, emanating from another transmitting station or generated by natural means, to be prevented from interfering with the signals which it is desired to receive. It is also employed, and this is probably its more important use, to ascertain the direction in which a transmitting station, from which signals are being received, lies from the receiving station. This latter application of the subject has nowadays become practically indispensable to navigation, especially in narrow and crowded waters such as those round the British Isles. The first edition of the book under review, which appeared five years ago, was welcomed as supplying greatly needed information on this subject, but the developments which have taken place in the art since that time have caused much of the earlier edition to be out of date, and consequently a new and revised edition has become necessary.

Following a short historical survey of the subject, chapters are given on the directional properties of aerial systems; frame aerial reception; rotating frame D.F. installations and the Bellini-Tosi system. Many other important aspects of the subject are dealt with, such as suitable installations for work on shore, on ship, and in the air; night effect and other freak phenomena; fault clearing and maintenance; and notes on field and nautical astronomy.

The book is written in a very clear and interesting manner and is fully illustrated with diagrams, drawings and photographic reproductions. It should form part of the library of everyone interested in wireless communication.

"The Principles of Radio Communication." By John H. Morecroft, assisted by A. Pinto and W. A. Curry. Published by Chapman & Hall, 11, Henrietta Street, W.C.2. Second Edition, 1,001 pp. Price 37s. 6d. net.)

The first edition of this book was published in 1921, and at that time was the most up-to-date and authoritative work on the subject. During the last six years, however, the developments in radio communication have been so great that much of the matter in this edition has become obsolete, and a large amount of new matter which should be incorporated in a standard text book has accumulated. In the edition now under review the necessary modifications to meet these circumstances have been made. Certain portions which were out of date have been omitted, and a large amount of new material added. Among this new material may be specially mentioned field strength measurements, short-wave propagation with the phenomena of reflection, absorption and fading, voice analysis for radiotelephony, loud speakers, crystal control of frequency, and the various new arrangements for amplification.

For readers who are already familiar with the earlier edition it will only be necessary to say that the new edition takes the same rank in radio literature to-day as was occupied by the first edition when it appeared. For those, however, who may not have been acquainted with the earlier edition we give below a summary of the ground which is covered by the new one.

The first two chapters contain a résumé of general electrical theory, and the next deals with the phenomena in oscillatory circuits. The following chapter gives a general view of the methods of communication in which electromagnetic waves are employed.

Then follow chapters on spark telegraphy, the theory of electronic valves and their application to wireless telegraphy, continuous wave telegraphy, wireless telephony, the various types of aerials with the phenomena associated with them, and amplifiers.

The book concludes with a very full index.

The subject matter is dealt with in the same clear manner which distinguished the first edition and the general get-up of the book is excellent. It should be on the shelves of everyone interested in any way with the technical side of wireless telegraphy.

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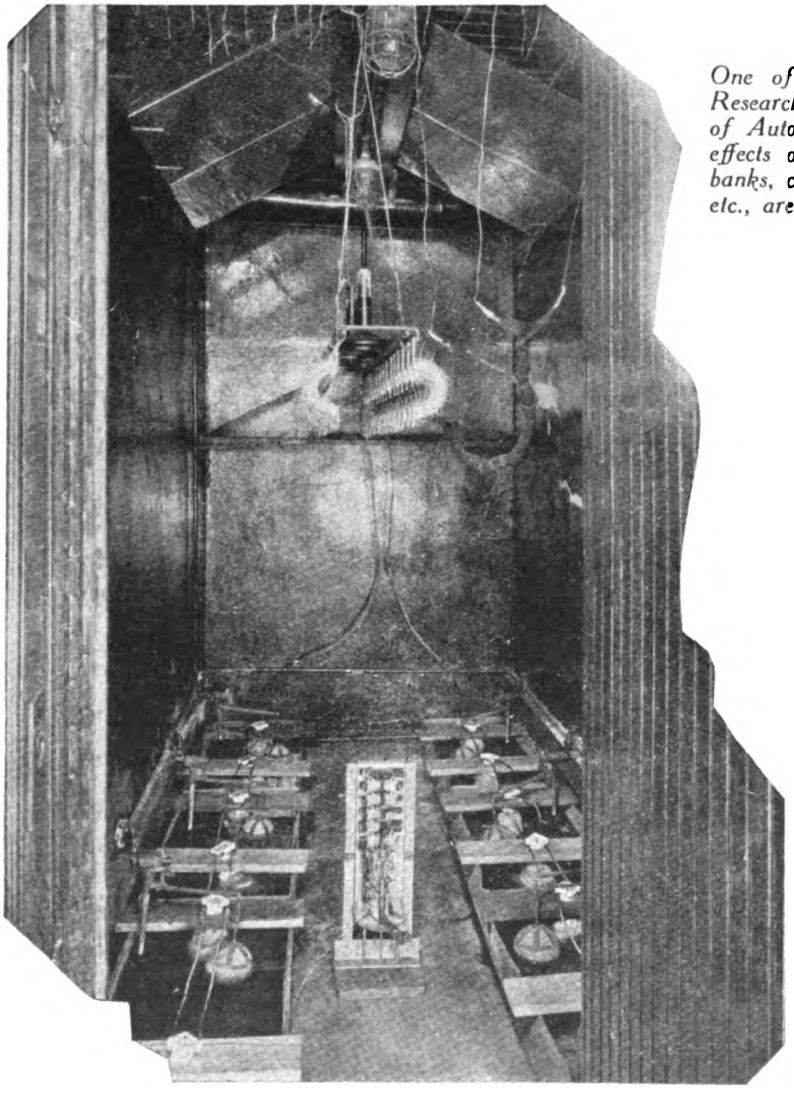

One of the humidity rooms in the Research and Development Department of Automatic Electric Inc. Here the effects of moisture on cables, switch banks, condensers, switch mechanisms, etc., are determined.

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The
Telegraph and Telephone Journal.

PUBLISHED MONTHLY IN THE INTERESTS OF THE TELEGRAPH AND TELEPHONE SERVICE, UNDER THE PATRONAGE OF THE POSTMASTER-GENERAL.

Editing and Organising Committee - - - J. STUART JONES. W. D. SHARP. J. F. STIRLING. W. A. VALENTINE. J. W. WISSENDEN.

Managing Editor - - - W. H. GUNSTON.

NOTICES.

As the object of the JOURNAL *is the interchange of information on all subjects affecting the Telegraph and Telephone Service, the Managing Editor will be glad to consider contributions, and all communications together with photographs, diagrams, or other illustrations, should be addressed to him at the G.P.O. North, London, E.C.*1. *The Managing Editor will not be responsible for any manuscripts which he finds himself unable to use, but he will take the utmost care to return such manuscripts as promptly as possible. Photographs illustrating accepted articles will be returned if desired.*

VOL. XIV. JANUARY, 1928. No. 154.

AN EVENTFUL YEAR.

THE year 1927 has been a remarkable one in the annals of the telegraph and telephone services of this country. The inauguration of transatlantic telephony, the extension of the "beam" telegraph services to Australia, South Africa, and India, the spread of automatic telephony at home, and the far-reaching development of the Anglo-Continental telephone services have all combined to leave their mark on the past year. Besides the establishment, by the aid of radio-telephony, of communication with the telephone exchange systems of the United States, Canada, and Cuba, telephone service has been extended within the last twelve months to Sweden, Norway, Denmark, Austria, and the Free City of Danzig, and during the same period much-needed direct circuits have been provided between Great Britain and Switzerland, affording an efficient service to all places in both countries. These developments are referred to in more detail elsewhere.

We have remarked before in these columns that although the Anglo-French service was opened as long ago as 1891, in 1921, thirty years later, the Anglo-Continental service was little used except between London and Paris, Lille, Brussels, and Antwerp. The important extensions of the service to Holland in 1922 and to Germany in 1926 brought the number of States with which communication could be obtained to five (including Switzerland, to which a service via Paris was opened in 1913). This year has seen them increased to ten, and preparations completed for an early extension to two more. With the telephone at his elbow, the London subscriber (in most cases, the British subscriber) can speak from his home not only across the Atlantic, not only to capital cities of the European countries mentioned, to commercial centres such as Lyons, Zurich, Antwerp, Cologne, Frankfurt, Hamburg, Leipzig, Gothenburg, &c., to Swiss mountain resorts and Belgian and German Spas, but also with Prussian towns on the Lithuanian border, and Swedish towns in the Arctic circle.

The development of the inland telephone system has brought the number of telephones in use up to about 1,635,000, as nearly as can be estimated at the time of writing. Of these about 1,600,000 are connected with the Post Office system, an increase of 124,000 for the year. There is now a ratio of about 27 inhabitants to every telephone in the country. The latest returns indicate that the number of exchanges in existence at Dec. 31 should be 4,270, an increase of 150 for the year.

An event of the year was the opening of the first public automatic exchange in London, viz., Holborn. During the year the manual systems of Halifax, Harrogate, Llandudno, Colwyn Bay, Gloucester, Brighton, Hove, &c., Sheffield and suburbs, the Potteries towns, Burnley, Southport and suburbs, Wakefield, and Exeter were converted to automatic working. The total number of Post Office telephone stations working on this principle is now upwards of 171,000.

Turning to radio-telegraphy, it may be recorded that the total number of wireless licenses at the end of October last was 2,338,078, representing an increase in twelve months of 240,760. There was a further gain of 18,000 in the month of November.

Perhaps the most significant event in telegraphy during the year was the inauguration of the beam services. The Canadian service was opened in 1926; but 1927 saw the opening of the Australian service in April, the South African service in July, and the Indian service in September, and each of the three services offered to the public rates that are lower than the present cable rates, and substantially lower than the cable-rates previously in force. The experience of any one of these Beam services proved to be no safe guide in making plans for the others; the South African service is very largely immune from fading, but each of the other services has its fading periods, which vary partly with the time of year and partly in a manner quite unpredictable. No one would be rash enough to claim that all these problems have yet been solved; but the Central Telegraph Office and the engineering staff are greatly to be congratulated on the progress that has been made to their solution, with the willing co-operation of the wireless companies at the other end of the circuits. There can be no doubt that the Beam has already proved more successful than even the greatest optimist among us would have dared to prophesy.

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THE TELEPHONES OF THE WORLD.

THE annual review of the development of the telephone systems of the world which we are again able to present to our readers, shows that development is proceeding on its usual lines, without surprises and without disappointments—except, indeed, the slight disappointment that Europe's total increased only by 518,000 as against 610,000 during the year 1925. As usual, rather more than one-and-a-half million telephones were added to the sum of those in operation in the world—which means that by the time they can be collected the total obtained is always one-and-a-half million behind the total of the moment; as usual, America's preponderance is well maintained; and, as usual, the best-developed States show the largest actual increases and generally the lowest percentage increase in stations. Europe is increasing, judged by 1926, at the rate of 7% and America by 5%. It is reasonable to assume that the former figure will be maintained for some years to come; it is equally reasonable to suppose that the latter figure will decrease, for the telephone in a continent with one station to every 8 inhabitants (including blacks) cannot increase indefinitely at the rate of 5%, whilst Europe, with several great civilised countries in a backward state of telephone development could well increase her rate of growth under favouring circumstances. Nevertheless, even with this assumption, Europe will be hard put to it to reach in 1935 one-half the total number of telephones America will possess in that year.

We fully expect, however, to find that Europe has increased by over 600,000 during the past year. Great Britain's growth goes forward each year; in 1925 it was 115,000; in 1926, 120,000; in 1927 (as nearly as we can estimate), 124,000. Germany, whose development was below the normal last year, will, we hope, have regained her former rate of increase. France's rate of increase has been steadily upward, and also has that of Belgium. These, with the countries hitherto backward in development but which are now showing marked signs of activity, such as Russia, Italy and Spain, will, we imagine, show figures for the year just closed which will result in a considerable improvement in the telephonic position of Europe.

At the time of writing there are probably 30,775,000 telephones in the world—a truly remarkable figure to be attained in forty-eight years!

HIC ET UBIQUE.

TELEPHONE service between this country and Czecho-Slovakia and Hungary was opened on Jan. 1, confined for the present to communication with Prague and Buda-Pest. The charge for a 3 minutes' day call is 13*s*. 9*d*. to Prague and 15*s*. 6*d*. to Buda-Pest.

The Press informs us that a regular wireless telephone service from Angora to London is expected to commence on Jan. 1 1928! As nothing is known of the matter in the Telephone Branch of the Post Office, we conclude that the Press conjurors have produced this particular Angora rabbit out of their own hats.

"The right of a telephone subscriber on a rural party line to talk German, even if it *does* deprive all the listeners-in of knowing what he is saying, drew the attention of the Kansas Public Service Commission recently." So *Telephony* reports, and informs us that the Commission ruled that he could speak German. He had been annoyed by neighbours who insisted that all his telephone conversations should be in English. The complaints were not made by those he was talking to, but by others!

The case throws a curious sidelight on the habits of the American rural telephone-subscriber. The objection to the subscribers' speaking German was not and could not be based on any "defence-of-the-realm" theories, but simply that other party line subscribers could not gratify their curiosity by overhearing their neighbour's conversation, or at least understanding what they heard.

The transatlantic telephone was last month brought into the service of a buyer in Philadelphia anxious to secure two of the gems from the late Lieutenant-Colonel Sir George Holford's library, which is now being dispersed by Messrs. Sotheby. The sale was due to begin at one o'clock. At five minutes to the hour (7.55 a.m. New York time) the telephone in Messrs. Sotheby's office rang, and Dr. Rosenbach, still in bed, was giving his agent, Mr. H. C. Rham, instructions to bid for lots 221 and 248. He secured the first lot, Columna's "Hypnerotomachia Poliphili," printed on vellum at the Aldine Press, 1499, at £3,000, but failed to obtain the second lot, Dante's "La Divina Commedia," 1481. This went to Mr. Dring, of Quaritch's, for £3,950.

According to the *Electrical Review*, plans for the conversion of the whole of the Commonwealth's city telephones from the manual to the automatic exchange system, and for an extension of trunk-line services in all States, have been completed. Within the next five years 53 new automatic exchanges, serving 111,782 subscribers, would be opened in the Commonwealth; most of them would be conversions of manual exchanges, but a few would be additional to the number of exchanges already in existence.

The transatlantic service carried a "record" traffic on Christmas day. There were 16 outward and 28 inward calls, or 44 in all. They were principally in the nature of Christmas greetings from family gathering to family gathering, and were by no means confined to London and New York. From a village in Gloucestershire to San Francisco is a far cry; but in addition seasonable messages were exchanged between places as far apart as Melton Mowbray, Cheltenham, and Oxford on the one side and Philadelphia, Washington, Baltimore and Boston on the other.

We have received the following Christmas card from Jerusalem:—

To the Telephonists of Great Britain
(via *T. & T. Journal*):

KIND REMEMBRANCES AND ALL GOOD WISHES FOR A MERRY CHRISTMAS
AND A HAPPY NEW YEAR.

We hope to talk to you soon!

SUPERVISORS AND STAFF,
Xmas 1927. JERUSALEM EXCHANGE.

On our own behalf and that of the Telephonists of Great Britain we cordially reciprocate the good wishes.

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TELEGRAPH AND TELEPHONE FINANCE.*

BY SIR HENRY N. BUNBURY, K.C.B.

THERE are several ways of approaching this subject. They range from the study of the "infinitely great" to the study of the "infinitely small." We can, for instance, look at the movement of revenue, working expenses, and above all capital in the aggregate, and observe what are the characteristics and tendencies of these factors at the present time: what is happening to the services as organic undertakings. Alternatively we can put them under the financial microscope, analyse their costs, and so observe the characteristics and tendencies of the numerous small expenses which go to make up a unit of telegraph or telephone service. Some three years ago Mr. Waldegrave and I presented a paper in which the average cost of an inland telegram was analysed into its components and the results exhibited for the Society's information. It would be interesting to do the same for telephone service; for the costs which were prepared for the Telephone Rates Committee of 1920 were not published in any detail and are in any case now somewhat out of date.

On this occasion I propose to approach the subject on the broader lines. In passing we will consider some resemblances between the current problems of the Telegraph and Telephone Services and those of other public utility services. It will be necessary from time to time to quote figures showing the movement of the various financial factors such as cost, revenue and capital expenditure; but I will try not to introduce more figures than are necessary for the purpose in hand.

Now it is important to remember that just as the telegraph and telephone services are to a large extent from the point of view of the public alternative methods of rapid communication and are therefore in some degree competitive, so from our own point of view they are closely interwoven both in their engineering, operating and financial aspects. For instance, one of the reasons why telephone development in rural districts in this country is relatively backward is that this country has long had the finest rural telegraph service in the world. To that extent the telegraph service is bearing some small part (but it is a very small part) of the financial burden which in a country with a less efficient telegraph service would fall on the telephones. Again, the use of telephony in telegraph operation is steadily increasing, especially in the Phonogram service; and there is no doubt that over long distances the development of the telephone has enabled a telegraph service to be provided, at telegraph rates, which is vastly better than anything which the general public could have expected 15 or 20 years ago. In the opposite direction, some countries use telegraphic operation in the preparation of long-distance trunk calls, on the ground that it is cheaper to do the preparatory work telegraphically than to occupy a costly trunk telephone circuit for this purpose: though whether things really work out in this way seems to be open to doubt. Again, the fact that the telegraph and telephone circuits are usually carried on the same poles or in the same underground cables not only gives rise to some troublesome accounting problems but materially affects the cost of providing plant for the two services. Sixteen years ago the Engineering Accounts Committee asked themselves the question whether it was not desirable or necessary to finance all new engineering works from a common fund and to throw the whole capital expenditure on engineering plant into a common capital account which should lease circuits to the telegraph and telephone services on a suitable rental basis. The Committee came to the conclusion that owing to the impending transfer to the Post Office of the National Telephone Company's system, the time was not opportune; but they clearly felt that sooner or later a common capital account and a common capital fund would be the logical and most convenient solution of the problem.

All these considerations show that telegraph and telephone finance are, to put it at its lowest, closely interdependent. It might, indeed, be argued that telegraph and telephone service should be regarded as elements of a single service of electrical communication, largely interchangeable, their interchangeability to be governed mainly by considerations of finance. Development is certainly in this direction. It is in this light that we have to regard the financial facts which will be put before you. We all know that telephone business is increasing and telegraph business, at any rate inland, is diminishing; and most of us know that telephone business is increasing faster than telegraph business is diminishing; that is to say that there is a net increase, by whatever standard you like to measure it, in the volume of business of the two services taken together. It is interesting also to observe that the rate of falling off in inland telegraph business is not diminishing, but rather, so far as can be judged over a comparatively short period, increasing; while, on the other hand, the steady growth of telephone business seems scarcely to have been affected by the industrial depression through which we have been passing. Curiously enough this has not appeared to be the case in Germany, where during the recent period of marked depression telephone business has actually fallen off. The explanation probably is that this country is so far undeveloped telephonically that any fluctuations due to the condition of industry are masked by the steady progress which is being made in overtaking arrears. It may be observed that although telephonic expansion in the United States is still proceeding, and there is no evidence that the saturation point has yet been reached, our rate of expansion is higher. The addition to capital equipment in the Bell System of America is, expressed in money value, about 10% or 11% per annum; in this country it is about 13% per annum.

Let us now look at the salient characteristics of the services separately over a period; and I will take as that period the last five years. By beginning with 1922-23 we eliminate the disturbances caused by the post-war boom, the disorganised condition of the manufacturing industry and the abnormal conditions which were due to the fact that until that year the service had not fully recovered from the dislocation created by the war. The period we are taking is a period in which trade has been on the whole severely depressed, prices have been falling, and the pressure to secure improvements in efficiency and consequently cheaper working has been very great. All industry, and all public services, have been going through one of those phases of economic depression which are invariably, and necessarily, accompanied by a continuous effort to improve efficiency, to eliminate waste and to reduce costs.

The period which we are taking is a post-war period: and I should like here to say a word about the use of a pre-war year as a standard of comparison, especially as I do not propose to quote any pre-war figures. The advantages of taking pre-war experience as a standard or measuring rod by which to judge post-war performance is that it represented a state of affairs in which conditions of relative stability existed and in which economic forces had, or were thought to have, full play. For instance, if we want to estimate the ultimate stabilised relation of retail to wholesale prices we go back to a pre-war period and observe what that relation was then. Similarly, if we want to estimate the future price of a commodity which at the moment seems, for temporary reasons, to be out of parity with other commodities we see how its price was related to the price of other commodities before the war. Economists are, however, coming more and more to believe that the idea of a pre-war normality or, in the terms of the American slogan, "Back to normalcy!" is fallacious. The economic world made in 1919 a fresh start. Many of the pre-war economic conditions will never be restored. We have to build on foundations which are to an important extent new, and the problem of reconstruction is coming to be regarded not as a problem of getting back to pre-war conditions but as a problem of attaining an ever increasing degree of productive and commercial efficiency under the conditions of the post-war world. Just as during the war the cry changed from "Business as usual!" to "Win the War!" so men are no longer saying "Back to pre-War!" but "Let us strive to win the Peace."

It is rather in this spirit that I want to consider our subject of this evening.

We will begin with the Telephone Service. Here are the figures:—

I.—*Telephone Service.*

	1922-23.	1923-24.	1924-25.	1925-26.	1926-27.
Average Cost of Living index	93	77½	77½	77½	75
	£	£	£	£	£
Expenditure ...	12,791,000	12,866,000	14,154,000	15,607,000	17,204,000
Revenue ...	14,035,000	14,584,000	15,006,000	16,163,000	17,488,000
Surplus ...	1,244,000	1,718,000	852,000	556,000	284,000

["Sutton" payments excluded.]

The most noticeable thing about this table is the diminishing surplus; and in order not to alarm you unnecessarily, let me say at once that the diminution is due entirely to the large reductions of rates which were made in July 1922, July 1923, and July 1924. You may be interested to know what the surpluses would have been had those reductions not been made, and assuming that there would have been the same amount of business at the higher rates as in fact there has been at the reduced rates. The surplus would have been—

In 1922-23	£1,800,000, instead of	£1,244,000
In 1923-24	£3,400,000, „ „	£1,718,000
In 1924-25	£4,100,000, „ „	£852,000

In point of fact, however, it is as certain as anything can be that if the old rates had been maintained the traffic would have been less; but even so, the most tenable view is that there would have been at any rate no reduction in the surplus if the reductions in rates had not been made.

The next question which the figures suggest is a more difficult one. You will observe that the surplus in 1926-27 was the smallest surplus in the whole period, and was indeed so small as to be almost insignificant, representing as it does only about ¼% on the capital of the telephone service. Can we assume that we have now touched bottom, and that there is no reason to fear a deficit in the coming years if the present rates of charge are maintained and the price level is stabilised at about its present figure? For you will realise that the price level exercises an important effect on the working expenses and therefore on the surplus. A rise or fall of five points in the average bonus figure for the year means, at present, an increase or decrease of about £190,000 in the working expenses of the telephone service.

This is one of the most important problems which can confront a telephone service. Every public utility, whether conducted by the State or by a private undertaking, depends largely for its success on the good will of the public (which is not quite the same thing as the Press). And increases of charges are a very good way of getting rid of some at any rate of that good will. All telephone managements seem to be engaged in a sort of race between the natural tendency of telephone costs to rise as the density of the system grows, and the natural tendency of human ingenuity to do things more efficiently and more cheaply as science makes progress and experience

* Paper read to the Post Office Telephone and Telegraph Society of London.

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increases. If we in Great Britain can hold our present position I am inclined to think that in the course of a few years we shall no longer have the reputation of providing one of the most expensive telephone services in the world. Comparisons are difficult to make exactly because of the great variety in the form of the tariffs of different countries; but I am inclined to think that the gap between our charges and those of the countries which, like Scandinavia, have the reputation of providing a very cheap as well as efficient telephone service has already narrowed a good deal and will continue to narrow still more; while, on the other hand the telephone service in the United States, which is now, I think, distinctly more expensive than ours, seems likely to increase in cost rather than to diminish. The problem is, can we hold our present position?

It is not possible to give a positive answer to this question. So far as the immediate future is concerned, it seems likely that with industry and trade slowly improving, we have touched bottom for the moment and the surplus may even show a tendency to increase, if business activity makes progress and people have more money to spend on one of the minor irritations of modern civilisation. If, however, we take the longer view, the situation is more complex and perhaps not quite so reassuring. For the factor which more than any other governs the cost of telephone service is the fixed plant charges—the annual charges for depreciation, interest and (though this is less important) maintenance of the telephone plant. As you know, something like three quarters or more of the cost of giving telephone service is represented by plant and accommodation charges. And here we are faced with a problem which confronts all public utility services which make use of large quantities of fixed plant acquired at pre-war prices, and renewable at some time or other at post-war prices. What will happen to the tariff when a return has to be earned on a capital which no longer consists of pre-war values because the pre-war plant has all been scrapped and replaced?

It would seem natural to say that the benefit of the pre-war plant should accrue to existing consumers as long as it lasts, and that when that benefit is exhausted the public must be prepared to pay more (that is to say to pay on a post-war price level) for service. The public must be prepared for a rise in charges. This is what has been happening in America and, so far as I can judge, is likely to happen in countries such as Denmark, Sweden, and any other country which became highly developed telephonically before the great rise in prices took place. Unfortunately, however, the public, while it is willing to accept without comment, and certainly without gratitude, a service which has been cheapened by the possession of pre-war plant, offers the strongest resistance when the stocking is empty and the time comes to charge what the service is really costing. And because we are a State service and not a service conducted by private enterprise, we are peculiarly vulnerable to resistance of this kind.

This way of dealing with the problem is, however, not sound economics. The temporary advantage which is given by the possession of pre-war assets in a period of depreciated currency arises entirely from that depreciation. If the depreciation were to become permanent and stabilised the benefit of the advantage could be given at any convenient time, or better still, could be distributed over the whole period during which the advantage lasts. But we cannot safely assume that the depreciation will be stabilised or permanent, and if that is so, there is a serious danger in giving the benefit to consumers at a time when the depreciation is severe and having to terminate it at a time when the currency has appreciated and the public are naturally looking not for increased charges but for reductions. It is like selling cigars at 6*d*. each in a period of high prices when money is plentiful, so long as the stock lasts, and then having to raise the price to 9*d*. at a time when prices generally are lower, money is less plentiful, and more is expected of it. The theoretical economic solution of the problem of pre-war assets, therefore, would be to regulate the charges in accordance with the movement of the general price level in such a way that when their life is exhausted, it will be possible to replace them at the prices then current, while at the same time keeping the percentage increase of charges at a point somewhat below the percentage increase in general prices.

The question is by no means an academic one. In the United States, for instance, it is being fought out in the Courts between the Railway Companies and the Federal Commission which regulates the railways. The issue turns on the valuation of the railway systems on which they are by law entitled to a certain percentage return before any question of rate reduction or surrender of surplus to the State Treasury arises. The Commission maintains that they are only entitled to that return on the capital (mainly pre-war) actually spent in providing the systems: the Companies that it should be on the "reproduction value" at current prices. Of those systems I would suggest, for the consideration of those interested in such problems, that the Companies are more nearly right than the Commission, subject to one essential condition, viz., that the additional income which they would obtain under their contention should, in the main, not be distributed or divided but used to reduce the cost of renewing at post-war prices, pre-war plant. By such use it would serve as a buffer to take the shock which such renewals would otherwise cause to the financial structure of the system, and which would otherwise have to be absorbed by an increase of rates.

These considerations have led public utility services wherever they can to build up reserves against what we call the excess cost of renewal; and, of course, such reserves can only be provided by one means, that is to say by charging the consumer more than it would actually cost to provide him with service at the time. We ourselves in 1920 made a mild effort in this direction, until two years later the wisdom of Parliament pronounced that it was unnecessary, and the £200,000 a year which we were setting aside against the excess cost of renewals was, at the instance of the Select Committee of that year, discontinued. We may live to regret it.

Can we get any light from the accounts as to the course which events are likely to take in this matter? If you will look at the following table you will observe a tendency which is rather disquieting:—

II.—*Telephone Service.*

	1922-23.	1923-24.	1924-25.	1925-26.	1926-27.
	£	£	£	£	£
Revenue ...	14,035,000	14,584,000	15,006,000	16,163,000	17,488,000
Fixed Plant Charges, Interest and Depreciation	4,725,000	5,128,000	5,879,000	6,886,000	7,914,000
Do. as a percentage of Revenue ...	% 33.7	% 35.2	% 39.2	% 42.6	% 45.3

The figures represent the movement of fixed plant charges (I exclude maintenance because it does not in fact move in the same way) in relation to revenue. You will notice that it is going up all the time: and, so far as this factor is concerned, it will continue to go up, other things remaining equal, until somewhere about 1936 when the amount of pre-war plant carrying pre-war depreciation and interest charges will probably have become insignificant. It should be mentioned that the increase of the percentage in the first two years of the series is, of course, also due, in part, to the reductions of rates.

We have, therefore, a very small margin of revenue, and fixed plant charges whose growth represents each year a new charge on the revenue, or round about 3%. Clearly, we can only hope to escape financial embarrassment in one or other of four ways:—

(*a*) By a fall in the cost of living.
(*b*) By a fall in the cost of plant.
(*c*) By savings in operating cost due to the substitution of automatic for manual equipment—a factor which probably is already, to some small extent, causing the disproportionate growth of fixed plant charges.
(*d*) By accelerated growth of revenue in relation to capital.

(To be continued.)

PRESS TELEGRAM WORK.

IT was good to see the veteran ex-Controller of the C.T.O. at the reading desk of the I.E.E. on the 12th ult., when Mr. John Newlands, C.B.E., C.I.E., I.S.O., read an interesting paper with the above title.

Despite the close proximity of the date to Christmastide there was a good attendance, and had it not been for the length of the paper the debate which followed would no doubt have lacked nothing in vivacity.

Much of the paper was historic, but interestingly so, and was livened by the humorous extempore remarks which will probably not appear on the printed page.

Then came a comparison of the conditions of the last century with those of the present day, with certain criticisms regarding the policies of the past and how they have hampered the policy of the present and the future, which is simply saying that what has happened in the smaller sphere of the Post Office Telegraphs has not infrequently occurred in the much wider areas of national history and that the nemesis of the economic and political sins of our sires and grandsires does visit the third and fourth generation.

Stage three of the lecture was especially interesting, giving an account of the inception and successful "Development of the Joint Wire System for News Associations," as organised by Mr. Newlands on behalf of the Press Association, and perhaps it may be added, the hearty co-operation of the Post Office with its excellent underground system of wires, its prompt removal of faults, its immediate replacement of faulty lengths, and its ability to provide extensions for special events to any remote part of the county when needed.

The final half-hour of the meeting was well filled by the Chairman, Mr. L. Simon, Sir Henry Bunbury, Messrs. Sellars and Upcott, and Mr. Newlands, who replied to all the criticisms and questions—except one, and that was a query posed by Sir Henry, and was quite naturally of a financial nature. Had a pin been dropped it would surely have been heard while we waited for the vital answer, but the canny Sphinx would not! We therefore wended our way homeward, if not sadder, certainly not wiser on the £ *s*. *d*. situation as regards this particular private enterprise. The P.A. has a loyal servant, and the audience appreciated the reticence.

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THE WASHINGTON CONFERENCE.

III.

THE Washington Radiotelegraph Conference which met on Oct. 4 came to an end on Nov. 25. It was declared to be the largest International Treaty Conference ever held; but it does not follow that the value of its work was proportionate to its size. Its output of minutes and reports was enormous: sometimes the printed and typed documents distributed reached a total of 70,000 sheets a day, and the grand total throughout the Conference amounted to 1¾ million sheets. But the only thing that really matters—the actual Convention and Regulations which emerged from this welter of documents—is a modest little booklet containing about 80 articles.

The Conference made no very startling changes. Its two main tasks were to bring the detailed regulations of the radiotelegraph service up-to-date and to allocate wavelengths. It decided that wavelengths could not be allocated internationally to individual countries or to individual stations, but only to classes of services. It succeeded after a prolonged struggle in parcelling out the whole of the wave-bands from 5 to 30,000 metres among the various classes of services. It made a move—though not a violent one—in the direction of reducing spark working for ship and shore traffic. The Technical Committee (a very learned body of eminent professors and technicians) decided that to continue to talk about wavelengths expressed in metres was making things too simple and that we ought to talk about "frequencies in kilocycles per second."

The Conference introduced into the Convention a provision for compulsory arbitration of disputes concerning the interpretation or execution of the regulations. The only question which it tackled and failed to settle was that of votes. Delegations went to Washington with votes and came away without them. The new Convention contains no voting clause; and this thorny problem has been left over for the next Conference to settle.

The Washington Conference established a precedent by permitting the Press to attend. Newspaper men used to wander from one Committee room to another trying to pick up some crumbs of interesting information among masses of dry matter. It was, however, very difficult for them to understand what was going on: indeed, many of the delegates themselves had only the haziest impression of what was really happening. It is not surprising, therefore, that the Press reports which appeared from time to time showed more imagination than accuracy.

The total cost of the Conference, if account be taken of delegates' salaries, allowances and travelling expenses, must have reached an enormous figure. A mathematical delegate calculated that every time a speaker paused or coughed—bang went £1. This was a terrifying thought, more alarming even than the Transatlantic Telephone Service, the cost of which is reported to have cured several Scotchmen of stammering. The Radiotelegraph Service cannot afford the luxury of frequent meetings on the scale of the Washington Conference; and a proposal to reduce the interval between Conferences from five to four years was opposed by the British Delegation and defeated.

The choice of the meeting place for the next Conference presented unusual difficulty as Madrid, The Hague and Cairo were all offered. The prospect of writing Radiotelegraph Regulations under the shadow of the Pyramids was alluring; but delegates resisted the temptation, and a vote by ballot resulted in favour of Madrid, where the next Conference will accordingly be held in 1932.

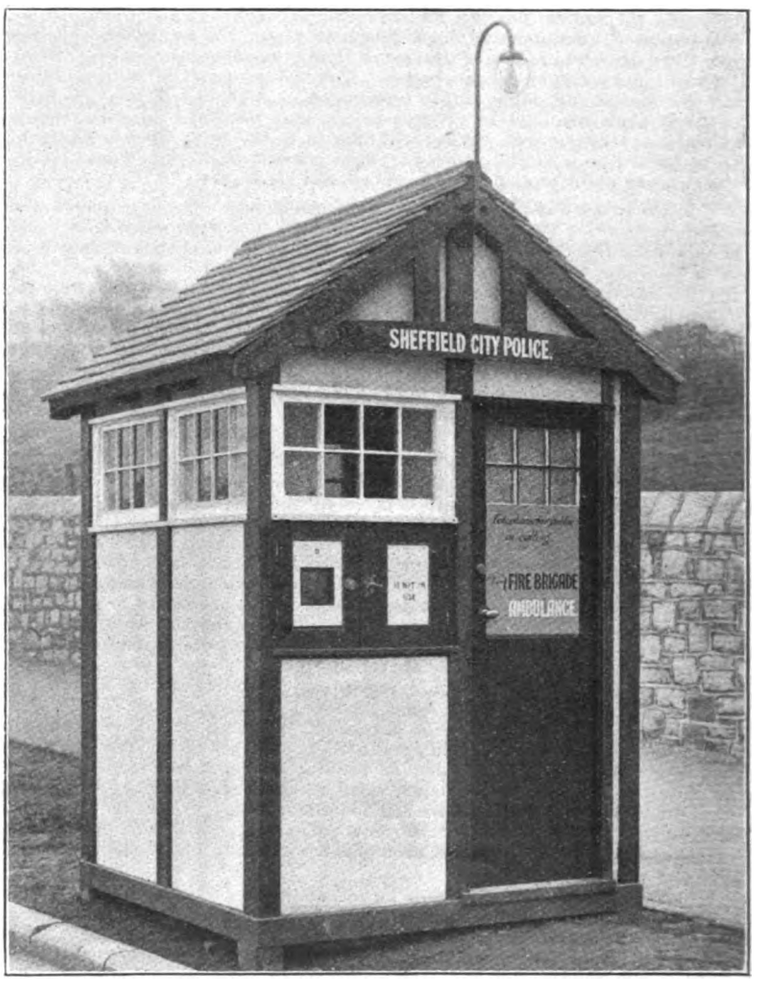
F. W. P.

SHEFFIELD POLICE BOXES.

THE illustration shows one of the police boxes now being provided in the streets of Sheffield.

About 150 boxes will be installed in various parts of the city and these will be in 4 groups, the boxes in each group being connected telephonically with a divisional police-station.

The telephone is so arranged that it may be used from the outside by the public for making police, fire and ambulance calls and from the inside



by the police officer, and duplicate indicators on the police-station switchboard will show whether a call is being made by the public or by the police.

A blue lamp is fitted over the roof of the box, which can be operated from the police station, and by its means the attention of the constable on the beat can be called when he is near the box.

Each box, which measures 5 ft. square, is provided with a water supply and wash-hand basin, electric light, an electric radiator (where possible) which is automatically switched off when the officer vacates the box, and the necessary furniture.

A complete set of first-aid appliances, packed in a small portable case, is kept in a locked cupboard which opens from the outside and is accessible to the public by breaking the glass to obtain the key.

It is believed that Sheffield is the first city in this country to install a system of this sort on so extensive a scale.

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PROGRESS OF THE TELEPHONE SYSTEM.

The total number of telephone stations working at Oct. 31, 1927, was 1,575,760. New stations added during October numbered 23,378 and ceased stations 14,578, resulting in a net increase of 8,800 on the total at the end of September.

The growth for the month is summarised below :—

Telephone Stations—	London.	Provinces.
Total at Oct. 31	556,707	1,019,053
Net increase for month	3,443	5,357
Residence Rate Subscribers—		
Total	124,413	200,885
Net increase	1,648	1,931
Call Office Stations—		
Total	5,007	18,147
Net increase	51	143
Kiosks—		
Total	698	3,228
Net increase	45	110
Rural Party Line Stations—		
Total	—	10,090
Net increase	—	2
Rural Railway Stations connected with Exchange System—		
Total	—	831
Net increase	—	14

The number of inland trunk calls dealt with during September—the latest statistics available—was 8,589,586, an average of 330,369 calls per day. During the six months ended Sept. 30, 50,980,883 calls were dealt with, representing an increase of 3,200,513 or 6.7% over the corresponding period of 1926.

Calls made to the Continent during September numbered 26,620 and from the Continent 28,852. For the six months ended September, the totals were—outgoing calls 154,668 and incoming calls 165,534, representing increases of 17.6% and 11.4% respectively over the half-year ended September, 1926.

Further progress was made during the month of November with the development of the local exchange system. New exchanges opened included the following :—

LONDON—Holborn (automatic).

PROVINCES—Brighton (automatic) Hove, Portslade, Preston, Rottingdean, Hanley (automatic), Burslem, Stoke-on-Trent, Chesterton, Longton, Newcastle (Staffs), Trentham, Exeter (automatic),

and among the more important exchanges extended were :—

LONDON—Lee Green, Putney, Seven Kings, Sutton.

PROVINCES—Bury, Lincoln, Linthorpe, Morecambe, Roundhay (automatic), Sale, Upton, Westbury-on-Tyne.

During the month the following additions to the main underground system were completed and brought into use :—

Newbridge—Aberbeeg.

London—Purley—Redhill—Reigate.

Newcastle-on-Tyne—Sunderland.

while 78 new overhead trunk circuits were completed, and 101 additional circuits were provided by means of spare wires in underground cables.

PRESS TELEGRAM WORK.*

BY J. NEWLANDS, C.B.E., C.I.E.

INTRODUCTION.

IT is somewhat difficult to realise that over fourteen momentous years have elapsed since I last had the opportunity and the privilege of delivering an address before the members of the Post Office Telephone and Telegraph Society, London. On that occasion, Nov. 24, 1913, the subject was "The Telegraph Service : Methods and Results." In that particular paper the principal methods of dealing with ordinary public messages under the Postal Telegraph System were faithfully recorded, covering a period of nearly 44 years' actual experiences. Much useful information was compiled indicating the progress which had been made and, at the same time, the carrying capacity of practically all the various telegraph instruments, old and new, was clearly demonstrated. The rapid growth of traffic in the telegraphic system under State control was indicated by statistics prepared in periods of five years. This showed that while the total number of telegrams dealt with during 1869—which was the last year of the old Telegraph Companies amounted to less than seven millions, the number had risen during the first year after the transfer of the telegraphs to the State, on Feb. 5, 1870, to 9,850,177. By 1910-11 the yearly total had reached 89,200,000. The high-water mark, however, had already been attained in 1899, when the number was 90,415,123. Since that date there has unfortunately been a steady and even marked decline which has apparently not even yet spent its force. This declension may be attributed in large measure to the rapid development of the telephone system and to some extent to the neglect to develop the telegraphs along somewhat similar lines after the "peak load" period.

During the period which has elapsed since 1913 many sessions of this Society have been held, and it may be safely conjectured that those who have carefully prepared and read papers before you have been in the main practical officers of the Department who were thoroughly imbued with a desire not only to trace out, marshal, and chronicle essential facts for your information but also to submit in their respective papers their quota of suggestions for the good of the Service generally. I begin this address by wondering whether or not the Post Office authorities have made any full or adequate use of the valuable material thus contributed during the past 14 or 15 years. My reason for asking this particular question is due to the fact that both while I was within the Department and also since retiring from the Postal Telegraph Service I have heard of the appointment of one Committee after another, each and all of them engaged upon the work of scrupulously probing into matters of daily routine and practice, all of which ought long ere now to have been well within the knowledge of those responsible for the supreme control or management of the Telegraph Department and also within their capacity to deal with if they had desired to make any real practical use of such information.

The foregoing, however, is merely stated as a preliminary to the address for this evening.

The subject for treatment to-night is "Press Telegram Work."

It will be useful if all of us can have in mind a clear definition of what is meant by the words "Press work."

The messages in all cases must contain only news to be used solely for publication in the newspapers to which they are addressed.

When one passes from such a complicated subject as "The Telegraph Service : Methods and Results,"—which appears to embrace practically every conceivable item within the service—and when one drops down to the single subject of the treatment of Press work it would seem at first sight as if it might be a very simple job indeed, but, as a matter of fact, it has been and still is one of the thorniest and most difficult subjects which the Postal Telegraph Department has ever had to cope with. It may well be asked by anyone here present, "Why has Press work been such a thorny and difficult matter ?"

In order to obtain an effective answer to this query we must go back a bit and trace out the history of the matter under the first stages.

Prior to the transfer of the telegraphs to the State in 1870 the transmission of news was in the hands of an "Intelligence Department," worked by the Electric and International Telegraph Company under an agreement with the Magnetic Telegraph Company and the United Kingdom Telegraph Company. This Intelligence Department had its own reporters, one was in the House of Lords and one in the House of Commons, while others were employed elsewhere. They collected and edited their own news supply including stocks, shipping and markets, with a very brief summary of Parliament. Only speeches by prominent politicians were undertaken.

The average length of the Parliamentary reports on Monday, Tuesday, Thursday and Friday ranged from one-and-a-half to two columns, say from 2,700 to 3,600 words (both Houses included), according to the importance of the debates. On Wednesday—which was evidently an "off" day—only a quarter to one-third of a column of news was supplied. In order

* Before the Post Office Telephone and Telegraph Society of London.

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to equalise matters over the different systems all the three companies undertook the distribution of a proportion of the "News" messages.

In addition to the above services certain short Sporting items giving "the results of great races" were furnished during the day, while arrangements were made for supplying special and more detailed racing reports at an additional annual charge to certain subscribing newspapers in London, Birmingham, Leeds, Liverpool, Manchester, Newcastle and Sheffield. *At 10 p.m.* reports giving details of the day's racing were transmitted to newspapers in the above-mentioned cities and the average quantity was estimated at one-eighth of a column for each paper.

Before leaving the subject of Racing one interesting item may be chronicled for your information and amusement. During Goodwood races 40 carrier pigeons were employed by the Intelligence Department to convey the "Results" from Goodwood Racecourse to Chichester because the Duke of Richmond would not allow telegraph posts to be erected in his park. Good old Duke! It should be understood that the Telegraph Companies' staff in the Intelligence Department were the judges of what kind and quantity of news should be telegraphed to the newspapers, and they sent on to provincial papers regular "expresses" or services each containing not more than 200 words per message at an annual charge which ranged from £150 to £250, the average being about £200.

Only those newspapers which entered into a definite contract for a complete year received these specified services at the reduced or Press rate of 30 words for 1*s.* up to 7 p.m., or 40 words for 1*s.* after 7 p.m., and a "copy" rate at 25%.

Messages to all other provincial papers must be prepaid at the ordinary or public rate of 20 words for 1*s.* with no "copy" rate.

There was a general understanding that the daily supply to those who had yearly contracts would be about 4,000 words, but it varied according to circumstances, being increased in volume to some extent when Parliament was in session. These charges, on an average, work out to a word rate of about 4*d.* per hundred. The newspapers have claimed that out of this 4*d.* 1½*d.* was spent in collecting and editing each 100 words, while 2½*d.* was spent in telegraphing the same 100 words. It is to be feared they lost sight altogether of the cost incurred in effecting delivery, which amounted to 1*d.* per message. Such a claim would not bear even a cursory examination.

According to the evidence given in 1868 before the Select Committee on the Telegraph Bill it was made perfectly evident that the newspapers generally *were by no means satisfied* with the regular daily "Expresses," and whenever there was anything really important "on" if it fell outside the scope of the news contracted for, then, whether it was a political speech of great importance or a report of some other highly interesting event, they had to pay a fee for reporting and extra charges for all such "specials" at the full Press rates. The amount of "special" news so taken was absolutely insignificant. Moreover, the quality of the news supplied under the contract system was frequently found to be unsuitable for publication in many of the papers. It was not what they wanted.

The general Press rates before the transfer were as follows:—

30 words, between 7 a.m. and 7 p.m.	1*s.* up to 100 miles. 1*s* 6*d.* up to 200 miles. 2*s.* above 200 miles.
40 words, between 7 p.m. and 7 a.m.	3*s.* to 6*s.* between Great Britain and Ireland.

For each additional newspaper *in the same town* a "copy" rate was charged of one-fourth of these rates, with a minimum of 1*s.* to each newspaper.

It will be observed that the Press "day rate" extended up to 7 p.m., and that the still cheaper "night rate" only commenced at 7 p.m., while the "copy" rate for each additional address after the first was only applicable to any other newspapers *within the same town*. Of course, in these early days there were but few places comparatively where there was more than one "morning" newspaper published daily. They would only be found in the larger cities. Nevertheless, it is obvious that the Telegraph Companies, when operating through their Intelligence Department, were cute enough to frame a thoroughly businesslike tariff, both for contract news and also for a suitable "copy" rate for any additional addresses *within the same town*.

Further, they provided "special wires" for *eight hours* in the night at an annual charge of £750. These circuits, seven in all, were appropriated to newspapers from 7 p.m. to 3 a.m. in Scotland and from 8 p.m. to 4 a.m. in the case of Ireland. The papers concerned were as under:—

Scotsman	Edinburgh.
Courant	"
Review	"
Herald	Glasgow.
N.B. Daily Mail	"
Irish Times	Dublin.
Freeman's Journal and *Saunder's News Letter* (Jointly at a rental of £937 10*s.*)	"

Of the above, only two had their special wires led direct into rooms within their own publishing offices. These were the *Scotsman*, Edinburgh, and the *Herald*, Glasgow. All the others terminated in the Telegraph Company's offices and delivery of "copy" was effected by means of messengers.

It is noteworthy that private telegraph companies were not in any way bound to observe "code time" when dealing with either fully-paid public telegrams or with news messages. Their Intelligence Department accordingly gave special priority over all ordinary public telegrams to the noon and closing quotations from the London Stock Exchange at 12.15 and 3.15 p.m. This was a great advantage to newspapers.

Any messages containing sporting prophecies, or having the appearance of an advertisement, or containing any matter not intended for publication must be charged at *ordinary* public rates, that is, 20 words for 1*s.* If any message exceeded the 200 words limit it ceased to be considered as entitled to the reduced Press rate and ordinary public rates had to be charged *for the whole quantity*.

On the *Times* Press Pass Book the following words were printed, viz.: "The Companies will not be responsible for errors, omissions or delays." A very wise precaution.

The high rates which were charged to each subscribing newspaper for special reports were practically prohibitive, and in all probability the only speech reported verbatim and telegraphed to the provincial daily press was the Queen's Speech at the opening of Parliament. In order to give this important speech the promptest possible dispatch it was telegraphed, so far as the Electric & International Telegraph Company was concerned, by means of their double needle apparatus. A very rapid signaller was placed at the sending end, while two men undertook the receiving at the different offices in circuit. One read out what was signalled while the other acted as a fast writer. It had to be passed on through several re-transmissions in order to reach all the newspapers entitled to receive it. The same procedure was adopted whenever lengthy "specials" were being transmitted.

Up to 1870 there were very few "evening" newspapers, only three or four, it is believed. In addition there were eight fly sheets containing a few brief telegrams. Moreover, the great bulk of the Press traffic was keyed or signalled by hand on simplex circuits. There was no duplex in these early days. . . . The so-called fast speed Wheatstone automatic apparatus was just coming slowly into use at from 60 to 80 words a minute. It was in use from London to Newcastle, Manchester, Glasgow and Edinburgh. Those were the days of low wages and high results. The work was always in arrears, congestion was rife everywhere, consequently the telegraph clerks of those days were at all times working against time. There were then practically no minor circuits because it was the rule only to cater for the larger towns where it would pay to open up telegraph communications. On the other hand there were omnibus circuits carrying as many as 20 separate railway or small town offices. Mr. Weaver, when asked by the Select Committee (Q 2778) about the desirability of opening new offices, said: "Of course, it would be very desirable to open one for the public good, but it would not be desirable for us, because it simply would not pay." A moment later he said (Q. 2794): "We always look first to profits, and then to the public interest."

You may possibly arrive at the conclusion that somehow or other the current had become reversed as soon as the Government got possession of the telegraphs, but the outlook towards the public was then, and necessarily, taken from quite a different angle. The general public interests had to be considered as a matter of course.

Q. 2802. He (Mr. Weaver) said: "I am a company's officer entirely."

Q. 2803 reads as follows: "And you give your evidence with reference to the company's interest?—Yes, I give my evidence with reference to the company's interest and with reference to paying a dividend, that is my business." Q. 2804. "And as large a dividend as possible?—Quite so.

It is worthy of being specially mentioned concerning the Electric Company's system, Mr. Weaver stated that taking the gross receipts of his company, 76% was received at 18 stations, these being offices in the largest cities in the United Kingdom. At 81 other offices the receipts were 15%, thus leaving only 9% at all their remaining offices. Clearly telegraphy was quite imperfectly developed.

The highest wages paid in London up to the transfer were 35*s.* per week for men and 18*s.* for women. These figures give an impressive idea of the advances made to the staff during the last 57 years. Of course, the times have altered to an enormous extent.

The premier company, the Electric and International, was incorporated in 1846. That company originally used Cook and Wheatstone's double needle instrument, then the single needle, and later on the printing system of Bain, which merged into that of the Morse and Wheatstone systems. Bain was an Edinburgh clockmaker.

The principal towns were connected by means of wires led along the route of a main line of railway.

Prior to 1870 many important towns had no direct communication with London, consequently transmissions and retransmissions led to excessive delay and telegrams for many large places had perforce to be passed from one company to another in order to reach their destination.

In 1866 the time occupied in sending a telegram between London and Bournemouth was two hours, and, worse still, between Manchester and Bolton, only a few miles away, the time occupied was two hours and a quarter.

The Telegraph Companies had added very little to their respective systems for five years before the transfer to the State. Moreover, their systems were incomplete because, for financial reasons, they restricted their operations as far as possible to the principal cities, avoiding the smaller towns villages and remote country districts. In the majority of towns provided with telegraphic communications, the office was situated at the railway station, whilst, in the larger cities, each company had an office at the business centre

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of the town, the outlying suburbs being almost entirely neglected. Nevertheless, they had succeeded in making telegraphy a paying concern. Mr. Frank Ives Scudamore, who was then one of the Assistant Secretaries of the Post Office, stated as part of his 125 pages of evidence before the Select Committee on the Electric Telegraphs Bill, that: "With regard to the land Companies, I think that the total paid-up capital is somewhere about two-and-a-half millions." Further: "The highest dividend paid by the largest company is 10%, and that is on all their shares. The second company has paid 8% on all its shares." Mr. Rodwell also said that the telegraph poles and all the plant were maintained out of revenue every year before the 10% dividend was declared.

Mr. Scudamore selected Mr. R. W. Johnston to be his assistant in arranging for the transfer of the telegraphs. Mr. Johnston had been a telegraph clerk in the Electric Telegraph Co.'s service in Edinburgh, but on passing a Civil Service Examination he had been appointed to the Secretary's Office, G.P.O., London. He was utilised to form a Corps of Instructors in Telegraphy and also to organise the "Special Staff" which moved about the United Kingdom attending race meetings, political demonstrations, &c., and this staff dealt on the spot with the large volume of Press traffic incidental to such gatherings.

It was clearly proved to the Select Committee that the trade of the Telegraph Companies was increasing at a rate of more than 10% per annum.

It was shown that the Electric and International Telegraph Company had a very large and gradually increasing reserve fund and this made the dividend payable by that company as secure as if it were a Government stock.

It should be understood that the telegraph system up to 1870 was almost entirely used by the commercial community and the daily newspapers. Therefore it is not to be wondered at that the demand for the State purchase of the telegraphs should have been organised and pressed forward by them. Practically all the Chambers of Commerce throughout the United Kingdom had petitioned in favour of State purchase with cheaper telegrams and they finally secured that great boon. Of course, as usual, all the petitioners emphasised the fact that the public generally would be the gainers, and, as the result proved, they were greatly benefited, but their gain was bought at a price and the taxpayers have had to foot the bill and cover the inevitable loss which ensued. The Select Committee finally agreed with the principal telegraph companies that the price to be paid for their respective undertakings should be on the basis of 20 years purchase of their present profits for the year ending on June 30, 1868, subject, of course, to the approval of Parliament. The Telegraph Act of 1868 was finally passed on July 31, 1868.

It had already been agreed between the Post Office and the representatives of the newspaper press that the postal telegraph system would act only as the transmitter of news and not in any sense as collectors of it. The newspapers undertook to form an association of their own in London for the collection and editing of all the services they would require and their "copy" would be handed over to the Post Office Telegraph Department for transmission.

Reuters was established in 1865.

The Press Association was established in 1868.

The Central News was established in 1870.

The Exchange Telegraph Co. was established in 1872.

Mr. Scudamore had prepared two estimates, one a minimum and the other a maximum forecast. On the mean of those two estimates he thought he should get a net revenue of £280,000 per annum, after paying all working expenses. With that sum the Government could, at 3½%, raise eight millions of money.

It was repeatedly urged, and confidently believed by the Post Office, and Treasury representatives, that the total cost of buying out the telegraph companies would be less than £6,000,000, but, as a matter of fact, it ultimately cost about £11,000,000, or nearly double the estimate. That fact alone was enough to imperil all the ordinary chances of making the scheme the huge success it might otherwise have been.

There is one other interesting point which it seems desirable to comment upon. The Select Committee sat on 9 days in July, 1868. They examined in all 21 witnesses. Only three of these witnesses were directly connected with the telegraph companies, and their entire evidence covers only 24 pages out of a total of 253.

The examination was very thorough, but one cannot help feeling that a good deal of useful and most beneficial information might well have been elicited from the three telegraph experts, who were Mr. R. S. Culley (Engineer-in-Chief of the Electric Co.), Mr. Henry Weaver (Secretary of the Electric Co.) and Mr. E. B. Bright (Secretary of the British and Irish Magnetic Co.). These trained and experienced men should have been well able to forecast the future under the projected Bill and to express a reliable opinion concerning the proposed "copy" rate of *2d.* for newspapers all over the United Kingdom, but as they belonged to the Telegraph Companies who were selling out no doubt the Select Committee knew best precisely what kind of information they wanted to obtain from them.

(To be continued.)

A BRIEF CHRONOLOGY FOR STUDENTS OF TELEGRAPHS, TELEPHONES AND POSTS.

BY HARRY G. SELLARS.

(Continued from page 65.)

1779 ... ... Coulomb established the fact that the intensity of an electric charge varied with the surface over which it was distributed, and proved that the force exerted between two electrified bodies varies inversely as the square of the distance between them.

John Palmer, of Bath, started an agitation for the use of coaches to carry the mails.

1780 ... ... George Adams, in an essay on electricity, showed the influence which a disturbance in the electrical condition of a given body produces on other bodies in the vicinity.

1781 ... ... d'Elhujar discovered tungsten.

1782 ... ... Volta devised a condenser.

1783 ... ... Dr. Milner invented an electrometer.

William Sturgeon born.

Net Post Office revenue, £160,000.

1784, July 16 ... Irish and British Post Offices separated. James, Viscount Clifden, and William Brabazon Ponsonby appointed joint Postmasters-General.

1784, Aug. 2 ... First mail coach ran from Bristol to London.

Postage raised on certain letters, in place of a tax on coal.

1785 ... ... Van Marum, of Haarlem, constructed a powerful electrical machine, and carried out experiments in heating wire by means of electrical discharges.

1786 ... ... Luigi Galvani, of Bologna, accidentally discovered electric currents when experimenting with two dissimilar metals and a frog's leg. He was unaware of Swammerdam's experiment in 1678.

Volta, of Pavia, obtained electricity from a "pile" made up of layers of copper and zinc discs separated by flannel moistened with brine. He also devised a "Couronne de Tasses," or "Crown of Cups," consisting of a number of vessels filled with brine, each containing a strip of zinc and copper, the copper of one cup being joined to the zinc of the next, and so on.

Saussure conducted experiments in electricity.

1787, Mar. 16 ... Georg Simon Ohm born at Erlangen.

Betancourt devised a telegraph system.

Mr. Lomond, of Paris, devised a telegraph system in which the letters of the alphabet were indicated by the movements of a pithball connected with the line, which was brought into contact with a charged conductor at the distant end.

1788 ... ... Commissioners of Fees and Gratuities found that Secretary to the Post Office had received about £50,000 privately, in 17 years, from the Packet Service. Persons employed in the Post Office prohibited from being concerned, directly or indirectly, in the Packets, or as agents for the owners.

1789 ... ... A. Bennet produced a battery made up of iron and zinc in caustic soda. He also invented the Gold Leaf electroscope with two leaves, and the "Doubler," a continuous electrophorous.

Nicholson introduced a revolving "Doubler."

Galvani made various electrical experiments. Galvanism is named after him.

1790, Mar. 12 ... John Frederick Daniell born.

1790, April 17 ... Benjamin Franklin died.

Net Post Office revenue, £330,000.

Chappè invented the semaphore, or optico-mechanical telegraph. He also devised a system of communication consisting of two clocks regulated so that the hands moved in unison and pointed to figures marked on the dials. The figure to be read was indicated by a signal sent by discharging a Leyden jar.

1791 ... ... Gosnell, accountant, of London, proposed two schemes for transferring money through the Post by order. After taking legal advice, the Post Office decided against its adoption.

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1791, April 27 ... Samuel Finley Breese Morse born in Charlestown, Massachusetts.

1791, Sept. 22 ... Michael Faraday born at Newington Butts, London.

1792 ... ... Claude Chappè designed the first signalling system to function regularly and called it the "tachygraphe."

1792, Oct. 1 ... With capital provided by the "Clerks of the Roads," a "Money Letter" (Money Order) system came into operation. Limit of an Order, £5 5*s*., and commission 6*d*. in the £ (payee paid half). Advices "franked" by the Post Office.

Fabroni suggested that the prime cause of difference of potential was chemical action. (This view was supported by Faraday, Wollaston, and Davy.)

1793, Jan. 1 ... Commission on Money Orders reduced to 4*d*. for London orders, but remained at 6*d*. for orders between country towns. Whole commission paid by remitter.

A suggestion made to raise the limit to £20 was not adopted.

1793, Dec. 2 ... "Atalanta" (French flag) attacked the Packet Boat "Antelope," but was beaten and captured. Pensions allowed to certain members of the crew.

1794 ... ... Communication opened between Paris and Lille by means of Chappè's apparatus.

1795 ... ... Semaphore with three pairs of movable arms adopted by the British Government.

Cavallo suggested cloth and pitch as insulating materials.

Don Francisco Salva, at the Academy of Sciences in Barcelona, suggested communicating by means of six or eight wires each charged by a Leyden jar, and the combinations of which could be arranged to indicate the various letters of the alphabet. He proposed that the wires should be separately insulated and rolled into a single cable, and described experiments in which the wires were covered with pitch-coated paper and tied together, the whole being bound round with paper.

Salva also suggested that such cables could be laid in tubes underground or beneath the sea.

Cavallo, in London, transmitted signals through wires by means of discharges from Leyden jars.

Commission on Money Orders raised to 8*d*. in the £.

1796, April 20 ... B. R. Gleig born.

Aldini, on passing electrical currents through dead animals, noticed contraction of the muscles.

Zanotti, on sending a current through a dead grasshopper, caused it to chirp.

1797, Dec. 17 ... Joseph Henry born in U.S.A.

Rates of postage increased.

1798, April 1 ... French Minister of War ordered the apparatus of Chappè to be called the "télégraphe."

1798, April 5 ... "Clerks of the Roads," having lost over £300, gave up the Money Order scheme. Messrs. Barnes (Senior Clerk of the Roads), Daniel Stow (Superintending President of the Inland Office), and Slater, continued the Money Order Office as a private speculation, and other partners joined from time to time.

Mr. Bourne, Assistant Inspector of Dead Letters, suggested establishment of a Ship Letter Office.

1798, Dec. 4 ... Luigi Galvani died.

1799, Sept. 10 ... Ship Letter Office established.

Profits of the Bye-Letter Office reached £200,000 per annum.

Net revenue of Post Office, £720,982.

1800 ... ... Fabroni originated the chemical theory of voltaic electricity.

Volta constructed first absolute electrometer and a condensing electroscope, and introduced the electric battery. (Volt = Unit of electric-motive force.)

He measured the difference of potential between two metals and was of opinion that difference of potential originated from the contact of two dissimilar metals. This theory was supported by Ritter, Pfaff, Ohm, Biot and others.

Carlisle and Nicholson discovered that an electric current passed through water decomposed the liquid into its constituent gases.

Marie and Davy devised a battery with zinc in water and carbon in bisulphate of mercury.

Laplace stated that the electric tension at a given point is proportional to the square of the electric density.

1800, May 14 ... Don Francisco Salva, before the Barcelona Academy of Sciences, described experiments which indicated that voltaic currents could be used for transmitting signals.

Humphry Davy observed that an electric flame and a brilliant light were produced if two pieces of wood charcoal joined to the terminals of a battery were brought into contact and then drawn apart for a short distance.

Number of Money Orders issued in London—11,880.

Post Office Directory commenced publication.

1801 ... ... Wollaston discovered that, if a piece of silver connected with a more positive metal were immersed in a solution of copper, the silver became coated with a thin layer of copper. He proposed diminishing the resistance in batteries by doubling the size of the copper plate and bending it round the zinc.

Gautherot noticed that silver, platinum and gold, placed in acidulated water, could return a secondary current after a connecting battery had been removed.

Postmaster-General authorised to collect and convey letters from places, other than "post towns," and to make arrangements with the inhabitants as regards fees. As the fifth clause of the authorising Act gave this permission, the posts instituted were called "fifth clause posts."

Renè Just Hauy found that certain crystals, when pressed, became electrical.

London penny post changed to a twopenny post. Penny posts continued in provincial towns.

1802 ... ... Ramagnosi, of Trente, found that a voltaic pile adjacent to a magnetic needle caused it to be deflected.

1802, Feb. ... Charles Wheatstone born at Gloucester.

Hatchett discovered tantalum.

1803, June 28 ... Collision in the Atlantic between H.M. Packet "Lady Hobart" and an iceberg.

Ritter devised a secondary battery in which the electrodes were made of platinum. He discovered that certain flowers closed when electrified.

Cruikshank observed that, when a current was passed through solutions of lead, copper, or silver, deposits of the metals appeared at the wire connected to the zinc end of the battery. He also suggested making up batteries in trough form.

1804, Oct. 24 ... Wilhelm Eduard Weber born.

Richard Lovell Edgeworth set up telegraphs between Dublin and Galway.

1805 ... ... Brugnatelli, pursuing Wollaston's discovery, gilded two silver medals by attaching them to the negative pole of a battery and suspending them in a solution of salt of gold.

Admiral Sir Home Riggs Popham introduced a system of flag signalling, consisting of 26 flags and pennants, which formed the foundation of the present international code.

Grotthuss put forward a molecular theory to explain the transfer of electricity and matter through the liquid of a volta cell.

Don Francisco Salva used a voltaic pile for sending signals, their presence being indicated at the receiving end by the liberation of bubbles of gas in water.

Rates of postage increased.

1806 ... ... William Fothergill Cooke born at Hastings.

Eduard Friedrich Weber, brother of W. E. Weber, born.

1806, Aug. 23 ... Charles Augustin de Coulomb died.

1807, Feb. 19 ... Mr. Whitbread, in the House of Commons, proposed the establishment of a "national institution in the nature of a bank, for the use and advantage of the labouring classes alone." The suggestion was not pursued.

1808 ... ... Soemmering, at Petersburg, using submerged conductors, exploded gunpowder by means of electric current.

Sir Humphry Davy produced a primitive electric arc.

Postmaster-General decided that penny posts should be granted to villages.

1809 ... ... Post Office admitted it could not prevent the collection and dispatch of letters to places abroad by private agencies.

Soemmering described to the Munich Academy of Sciences a telegraph apparatus in which, at the receiving end, 27 lines, each allotted to a letter or symbol, terminated

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in a receptacle containing water. At the sending station a key, which brought a battery into circuit, was connected as required to each of the line wires. The passage of a current caused chemical decomposition of the water and the message was read by observing at which of the terminals the bubbles of gas appeared.

Zamboni constructed a dry battery composed of paper discs coated with zinc foil on one side and with binoxide of manganese on the other.

1810, Feb. 24 ... Henry Cavendish died.

Morse graduated at Yale University.

Schilling produced a telegraph apparatus.

Singer improved Bennet's electrometer.

1811, Mar. 31 ... Robert Wilhelm Bunsen born.

1812 ... ... Postage ranged from 4*d.* to 13*d.* according to mileage.

1813 ... ... Morse exhibited his first picture at the Royal Academy.

Firm of Reid Brothers, who constructed most of the early telegraphic apparatus, founded.

1814 ... ... Morichini demonstrated the magnetic effects of violet rays of light.

(Elster and Geitel also carried out experiments in connexion with the effect of ultra violet rays.

Bichat, Hoor and Blondict studied the effect of daylight and sun on metals.)

1814, May 1 ... Action between H.M. Packet "Hinchinbrook" and the American privateer "Grand Turk."

(*To be continued.*)

CHIEF OF THE CANADIAN PACIFIC TELEGRAPH SYSTEM.

STORY OF MR. MCMILLAN'S CAREER.

HARD work, blended with the characteristic Scottish ambition, is the secret of Mr. McMillan's success. Entering the service of the Canadian Pacific on June 6, 1883, he constructed the first permanent telegraph line between Winnepeg and Fort William. Transferring from the section east of Fort William to Medicine Hat, following the laying of the steel line from Medicine Hat to the summit of the Rocky Mountains, now known as Stephen Station, he continued in charge of the Telegraph Construction Department until early in 1885, when he was placed in charge of building the Dominion Government telegraph line from Dunmore to Medicine Hat, Lothbridge, and Fort McLeod. In those days there was not a single building in Lethbridge above the river bank, and only a few along the river bottom where coal mines were being developed.

Mr. McMillan connected the first instrument in the Government service at Lethbridge and Fort McLeod; and has many stirring stories to tell of his experiences at that time. The second Riel rebellion had broken out, and one day, when the line was nearing Lethbridge, a detachment of the Royal North-west Mounted Police stopped to enquire if any despatches from the scene of fighting had been received. The instruments were connected and the operator enquired if any information was available. Shortly afterwards the reply came: "General Middleton completely annihilated." The instrument then stopped working. The Mounted Police officers were thunderstruck, but their consternation was turned to joy when the message was completed: "General Middleton completely annihilated the rebels." The only cloud to their rejoicing was the knowledge that some of their splendid men had made the supreme sacrifice.

Mr. McMillan was in charge of construction of the Government telegraph line from Moose Jaw to Wood Mountain under Mr. F. N. Gisborne, General Superintendent in charge of Dominion Government Telegraphs, and later, his son, Mr. Hartley Gisborne To Mr. F. N. Gisborne belongs the honour of having laid the first deep-sea cable on the Canadian side of the Atlantic. The first section of the deep-sea cable was laid between Prince Edward Island and the coast of New Brunswick, and Mr. McMillan looks back with a great deal of pleasure to having been associated with a man of outstanding ability and a man who, in his time, added greatly to the record of British achievement.

Mr. McMillan continued in the Government service till after the execution of Riel, returning to the Canadian Pacific service, in 1886, in charge of the maintenance of lines on the British Columbia division. When the first through train made the journey from ocean to ocean during the earlier years of railway operation through the Canadian Rockies, there was much to contend with. Some of the seasons were extremely trying, and much of the heavy timbered section of the Rockies was exposed to very serious fires. These, in the earlier years, were followed by periods of extreme high water, and great difficulty was experienced in maintaining railway and telegraph operations.

After four years of service in the construction and maintenance of lines, Mr. McMillan was placed on special electrical work, followed by an assignment to the operation of lines. In this capacity he worked as operator, repeater chief, and inspector till 1905, when he was appointed Assistant Superintendent at Winnipeg. Twelve months later he removed to Calgary as Superintendent, and, in 1912, was promoted to the position of Superintendent at Winnipeg, and during the succeeding year, of General Superintendent at Winnipeg in charge of lines west of Fort William. In 1915 he was appointed General Manager of Telegraphs, with headquarters at Montreal, in executive control of a system which embraces over 120,000 miles of telegraph line and which is a potent link in the Empire chain of communication.

It is a great story, a story of success gained by hard work and all-round efficiency. Mr. McMillan has worked in every single capacity—from the first service in the building of telegraph lines to the equipment, supervision, operation, and general supervision of every department in the Canadian Pacific telegraph service. He knows all about the Canadian West, and the strenuous life of the early pioneer, and is an enthusiast in his belief of the future of the great Dominion.

He has one theory of service—"Work in the job you are on. Make the best of that."

KEITH MORRIS.

RETIREMENT OF MR. ALLAN MACLEAN.

MR. ALLAN MACLEAN, District Manager of the Post Office telephones in Northern Ireland, with headquarters at Queen's Buildings, Royal Avenue, who is retiring on superannuation at the end of the present year, has had a lengthened, varied, and intimate experience of telephony dating back for almost forty-five years. His duties in Ulster began in April, 1918, when he was transferred, several months before the Armistice, on promotion from Canterbury, in which important area he had, from 1916, a very busy and arduous experience, particularly during the intensive air raids period.

It was in May, 1883, that Mr. Maclean—who is a native of the Western Highlands, though his accent would scarce disclose the fact, commenced at Glasgow his connexion with the telephone service when in its infancy in Great Britain, for it was only in 1880 that the United Telephone Co., Ltd., was constituted, as the result of the amalgamation of the Bell and Edison Companies.

Following Glasgow, Mr. Maclean served, in connexion with the progressing telephonic system, in such important commercial and industrial centres as Edinburgh, Dundee, and Manchester, and in 1891 he was appointed local manager in Bolton. In Lancashire, as elsewhere, he made many friends amongst the business community, as well as socially.

An important stage in the career of Mr. Maclean was marked by his appointment in 1895 to be assistant district manager of the telephone service in Liverpool, which was at that time—as in the case of practically all the principal towns in the United Kingdom, including Belfast—under the jurisdiction of the National Telephone Co., the transfer of the system to the Post Office taking place on Jan. 1, 1912. It is an interesting coincidence that Mr. Maclean's friend, Mr. John Lee, C.B.E., who was Postmaster of Belfast 1917-19, was at this period engaged in the Post Office service at Liverpool headquarters, and became superintendent of the Birkenhead G.P.O. until his transfer to London in 1908. On a separate district being formed on the Cheshire side of the Mersey in 1898, Mr. Maclean was appointed District Manager, with headquarters at Birkenhead.

From Birkenhead he was transferred in 1909 to be District Manager of the Thames Valley area, with headquarters at Reading; and there he remained until shortly before the outbreak of the Great War in 1914, when he was appointed to the control of the Plymouth district.

During 1916, in consequence of the special war conditions prevailing, Mr. Maclean was placed in charge of the Canterbury district, where he was located during the greater part of the intensive air raids period until about six months before the Armistice, when he was, in April, 1918, promoted to be District Manager Post Office telephones for Northern Ireland, the area including Donegal until the establishment of the Parliament for the Six Counties. It is well within the recollection of the public of Ulster the tremendous difficulties under which the telephonic system was carried on during the troubled times of 1921 and 1922, when an organised system of dislocation was continuously being carried on by enemies of the Crown, with widespread risk to life and property. The efficient manner in which breakdowns were traced to their source and the necessary repairs—often on a very extensive scale and in remote parts, difficult, and indeed dangerous of access—and the practically normal conditions under which the telephone service generally was carried on, evidenced the skilled organisation directed by Mr. Maclean and the splendid co-operation of the staffs in the different branches in all emergencies.

Mr. Maclean will, in all certainty, carry with him in his well-earned retirement from the public service, the best wishes and gratitude of all who have had the privilege of being associated with him whether officially or in private life. He will also be greatly missed by the large staff of which he was so long the genial, courteous, and ever-thoughtful chief. It is his intention to take up residence in Edinburgh early in the New Year.

(Abridged from *Belfast Telegraph.*)

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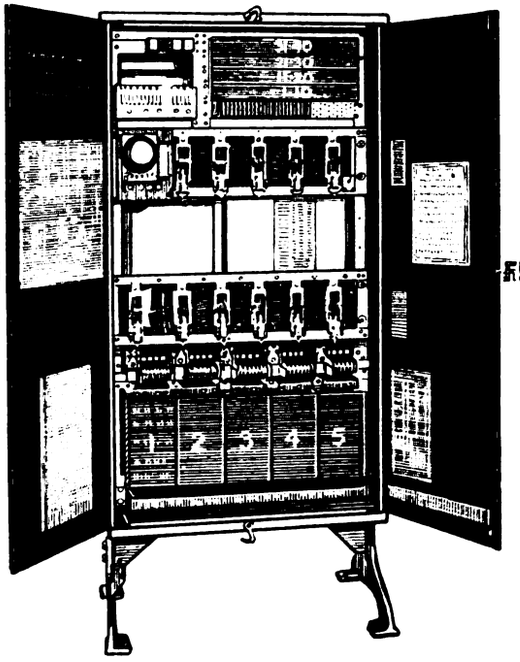

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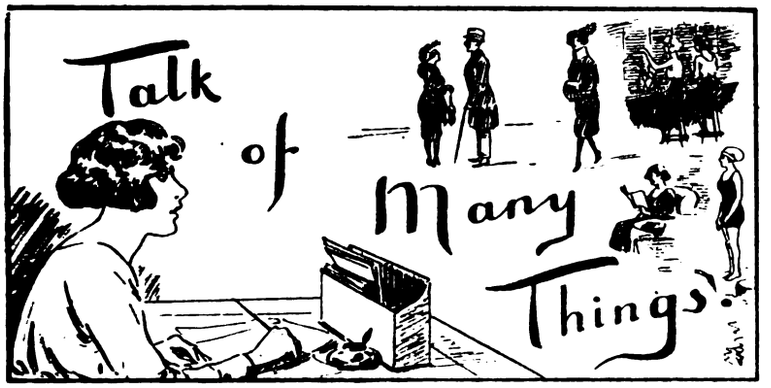

A Worm's-Eye View.

THE other morning I went out into the garden early—well, if you must know, it was 9 o'clock, and if you don't think that's early for a Sunday morning you clearly don't know much about me—don't interrupt with foolish remarks—and as I sauntered in a leisurely manner to and fro over the length and breadth of my demesne—or domain, as you please, but do be quiet—I heard a voice. It was a low voice, by which I mean that it was low down, by which I mean that it came from near the off-side toe of my carpet slipper—lord! what a lot of precise information you want: yes, yes, the left-hand foot. It said: "Hi! are you the fellow who feeds the birds in this garden every morning?" I stooped down and beheld that it was a worm who addressed me. "Yes," I said, "I am; what about it?" "You needn't shout," he said, "I may be only a worm, but I've got my feelings, same as you." "Ah," I said, as sympathetically as possible, and I sat me down upon the garden roller. "It's a dog's life being a worm," he continued, "Heaven knows I work hard enough turning over the mould in your blessed garden, and me with the rheumatism so bad owing to the wet weather that I can't turn, let alone make ends meet. If I try a simple S the lumbago gets me and it's positive agony to make an 8." "Tut, tut," I murmured. "Ah," he said, "I know how much to value your sympathy; you and your bird-feeding. Luckily you're not much of a hand with that roller. Your neighbour next door is a perfect terror. That's why I moved into your garden—but bless you, if it's not one thing it's another. Life's just a long-drawn-out wriggle. Things were not always so," he went on, with a sigh; "I come of an ancient lineage—quite a long line, in fact, and," he added, drawing himself up proudly, "we've had books written about us." "Ah," I said again, for to tell the truth I was not quite at my ease and the roller was hard, cold and wet. "Why don't you keep a cat," resumed his wormship, "I like cats—gentle, harmless creatures." "Why?" I said, "I don't keep a cat because I prefer to have the birds." "Huh, what a strange outlook on life," said the worm. "Just like you humans, a most inconsiderate and irrational lot—cruel, too. A week ago come Tuesday, you ran a spade through Uncle George. Last Saturday you sliced Sister Alice with your lawn-mower and she's still in a state about the loss of her head—calls it her better half: sheer vanity on her part, of course. Yesterday your neighbour flattened Brother Bill with a roller, and then on the top of all these affiictions you must feed the birds!" "Well," I said, "what about that?" "Why," he said, "can't you see—I don't like birds, the spiteful, vicious things, because they like me." "Oh, ah, um," I said, reflectively. "And another thing," the worm went on—and I never saw a worm in such a passion or looking so cross—"I suppose you believe in cremation."

But just then a thrush intervened, so I never really knew the purport of the worm's last remark. I suspect, however, that the thrush knew, for I swear he cocked his head at me and winked one eye as he flew off with his beak full. Of a truth it is the early worm that getteth the bird.

PERCY FLAGE.

A Telephone Romance.

(Continued.)

The next day they settled down to "Routine," which was a "Test" of the bride's affection, but she felt no "depression."

Most of the "Day time" she spent in the garden and in the evening she would walk across "Bushey Heath" to "meter" husband, where he would often "finder" half way. When unable to do this she listened to the "Traffic return."

On Saturday, as soon as he was "off duty," the bridegroom changed into a pair of "frayed cord" breeches and a "check" cap and with "hand set" to the plough he commenced to "Harrow." He soon removed the first "covering" of "earth" and then set some "miscellaneous plant," later they began to "exchange plant" with the neighbours who turned out to be a "rural party" and seemed very friendly.

As they both continued to "concentrate," the garden soon looked "effective," one corner was reserved for "pink routes" and a "Victoria" plum tree stood in an "end position" near the sun "dial." In the "extension" stood a row of "current" bushes and in an "adjacent position" a little "Redhill" of geraniums. From "local observations" they found that the next-door creeper was "over-lapping" the "dividing line" causing "congestion" among their "plants"; this they "adjusted," and later the bridegroom noticed a hint in the "green book" which he promptly "brought into use," namely, to fit "wire cages" over the "plants" to prevent the cats from "breaking in." The bride who left her head "uncovered," had recently had her hair "cut off" but now wore the "coils" connected into a "switch"; this suited her "outstanding features."

She would often call to the bridegroom in her "bell-like tone," but although he answered her in a "busy tone," there was always a "guarding tone" in his voice. On reaching the "City" on Monday morning the bridegroom endeavoured to purchase a certain "plant" and was "advised" "unobtainable," but when this was "disputed" it was "obtained" via another source. During the morning a "noisy" buzzer alighted on a "plant," causing the bride to feel "faint," but she soon "recovered" when it was in "safe custody."

Every "plant" was marked with a "designation label," but as there was a "Hayes" over the garden, these were difficult to see.

D. D.

[For further and last adventures, see our next issue.]

Gerrard.

The festal season at Gerrard began on Friday, Dec. 9, with a Christmas Party arranged by the Swimming Club, which proved a greater success than ever. Fancy costumes were the vogue of the evening, and from a visitor's point of view required a larger hall than the Dining Room to display the costumes to their full effect.

The first prize was awarded to "Mr. Wu," impersonated by Miss Greggain, whose mannerisms were so perfect one wondered if she had relatives in Chinatown.

The second prize went to "Aloma," represented by Miss Latimer, whose creation of poppies and beads immediately recalled "Nuitani" of the South Sea Isles.

The third prize was awarded to "Carmen" as impersonated by Miss Carmen, this creation being perfect even to the name.

Our old friend Mr. Keatley, at the piano, assisted by a saxophonist and jazz drummer, enticed many to their feet to enjoy the latest waltzes and fox-trots.

We were pleased to welcome so many old friends and colleagues from other exchanges.

E. L. E. S.

The Central Social.

And once again has Central helped,
The cause of charity;
For on the 6th we gave a dance,
To aid the children's tea.

The band composed of engineers,
Had just one hour's delay:
So many faults on C.C.I.
They could not get away.

The Misses Smith and Morris played,
Until the band could come,
Duets and many lively tunes,
And "T. A. B." the drum.

Miss Longman's comic numbers both
Caused merriment and stir.
We all enjoyed "The Movies,"
And doubled at "Oo'er."

Then everyone besieged Miss Brown,
Who told, with manner thrilling,
In mystic tones and hollow groans,
Our fortunes for a shilling.

Refreshments all the evening.
Were served by maidens sweet;
Who nimbly took your money,
And gave you lots to eat.

Then there was great excitement,
And everyone grew hot;
Miss Fordham held the lucky card,
And Miss Blake won the spot.

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And all the other artistes
In merry song and skit,
Made us all hope for encores—
Which time did not permit.

We thank Miss Buckwell and her staff,
And all those who attended.
And our best thanks to "T.A.B.,"
Who as M.C. was splendid.

D. D.

London Telephonists' Society.

Since last we wrote within this space, two more events have taken place.

The Whist Drive, held at Tothill Street, whereto we turned with eager feet; and Mr. Camp's, with graphs so rare, an "International" affair. Each one afforded joy, in parts, for some liked cards and some liked charts. We went to both—enjoyed them too, as many others seemed to do. We won no prize, nor have we yet, and who succeeded, we forget; excepting two, forget who could! Miss James and Mr. Hinshelwood.

With modest mien each winner took a prize, and then with terror shook. Loud cries of joy assailed their ears, and hardly anyone shed tears.

Held at the dear old Bishopsgate on January twenty eight, the Annual Dance we next will hymn, where we may glide on supple limb, and dance just anything we choose—the yale, a jazz, or latest blues. And all who for this column care we hope to meet and welcome there.

We wish you all a glad New Year and trust new writers will appear. May each one feel Good Luck's caress—your very grateful Editress.

Contributions to this column should be addressed: THE EDITRESS, "Talk of Many Things," *Telegraph and Telephone Journal*, Secretary's Office, G.P.O. (North), London, E.C.1.

LONDON TELEPHONE SERVICE NOTES.

Contract Branch.

THE amount of business done by the Contract Branch during the month of November, whilst not maintaining the high level reached in the previous month, showed an increase of over 500 stations as compared with the figures in the corresponding month of last year. The figures for November were:—

	Stations.
New business obtained	8,408
Ceasements	3,389
Net gain ...	5,019

The telephone habit is growing, and it is quite the fashion now for celebrities to have their photographs taken for publicity purposes whilst apparently earnestly talking into a telephone transmitter, with, however, no doubt in order to prevent complications, their finger negligently holding down the switch-hook. It is all to the good that these misshapen monstrosities of the newspaper artist, which were supposed to be telephones, seem to have disappeared in favour of more correctly drawn, and certainly more easily recognisable, instruments which do not require the letterpress underneath, as of old, to enable one to guess what they are intended to represent.

It is gratifying to learn that at a recent meeting of the Finsbury Borough Council a Labour Member, speaking in support of permission being granted for the erection of a public telephone kiosk in Rosebery Avenue, declared that the kiosks beautified the streets. A somewhat different view, however, is taken in another case in which it was found that a kiosk had not been erected exactly in the position agreed, resulting in the lighting being defective. On this being pointed out to the owner of the property, she wrote as follows: "My late husband arranged for the present position of the kiosk. In the circumstances, the kiosk to me stands there as long as you wish as a memorial." Whilst this is the first suggestion that has come under notice of kiosks being so used, the idea seems capable of expansion. Many owners of private property might like a telephone kiosk erected in their front gardens as a memorial to departed friends, and with this object in view some eminent architect might be requested to design a suitable memorial kiosk. The idea, of course, might be carried still further, and kiosks designed to commemorate some joyful event, although presumably the present standard colouring is bright enough for any joyous occasion.

In these days, when journalists attempt to sharpen their wit at the expense of the Telephone Service, it is refreshing to receive unsolicited such a letter as the following:—

"In reply to your favour of the 16th instant, for which I thank you, I desire to express my appreciation of the efficient manner in which I have been connected with the telephone service, of the expeditious way in which the necessary work has been done, and of the refreshing courtesy with which I have been treated from start to finish.

"For more years than I care to contemplate I have had very frequent occasion to use the 'phone in all parts of the country, and I cannot recall a single instance in which I have had any cause to complain. I certainly think the responsible officials have every reason to be proud of the service, which appears to be an ever improving one, and I congratulate you on its efficiency."

* * * *

Football.

Since the last notes appeared under this heading, four league games have been played, three of which have been won, and two of the victories were gained on our opponents' grounds. Thus, 6 points have been collected out of a possible 8, and 12 goals scored against 8.

The progress of the club so far has on the whole been satisfactory, the record since the beginning of the season being:—

				Goals.		
Played.	Won.	Lost.	Drawn.	For.	Against.	Points.
8	4	2	2	33	20	10

Recent games have included a home and away fixture with the Board of Education, and in the first match played at Chiswick we had to fight very hard to win by the odd goal in three. We met them again the following Saturday in the return match, at Raynes Park, and suffered our second defeat of the season by 3 goals to 2. It was naturally a disappointing result after the splendid win of the previous week, but there is no doubt the Board of Education adapted themselves to the wretched ground conditions far better than our people, who seemed unable to realise that it is impossible on a waterlogged pitch to make much headway by keeping the ball close and attempting to play a tip-tap game in mud and water. As this was only the first defeat since the opening game of the season, it perhaps seems unkind to criticise the result too severely, but there have been matches when a defeat would not have been altogether unexpected; but this was not one of them.

The War Office were comfortably defeated by 5 goals to 2, but it was rather late in the second half before our superiority was reflected in the scoring of goals. The game with the Ministry of Health at Chiswick was a hectic affair, and the result, a win of 3-2, was perhaps the team's finest achievement of the season. It was a hard battle, and one was glad to see the close of the contest with all the players on the field.

In the Challenge Shield Competition we secured a bye on the 1st round, and meet Taxes 1st eleven in the 2nd round, at Raynes Park on Jan. 7, 1928.

The following is a list of other games during January:—

Jan. 14	...	Colonial Office	Home.
„ 21	...	Ministry of Health	„
„ 28	...	Dollis Hill	Away.

* * * *

London Telephonists' Society.

On Friday, Dec. 2, the London Telephonists' Society held the third meeting of the session, at the City of London Y.M.C.A., Aldersgate Street, E.C.4.

Preceding the lecture, a concert was given by members of the Avenue Exchange. Sincere thanks are due to the ladies who gave so generously of their time, and the pleasure of a very appreciative audience was cordially expressed.

Mr. Camp's lecture on International Telephone Services was of great value.

We were able to survey the development of Anglo-Continental telephony during the last 36 years. During the first 12 years of this service, communication was limited to London-Paris. In 1903 cables between London and Brussels were brought into use. The following year the Anglo-French system was extended, and certain provincial towns in England and France were able to obtain communication one with another. In 1913 a service to Switzerland was inaugurated, but communication was obtained via Paris, and a direct route was not available until 1924.

The war was responsible for an increase of circuits between London and Paris, and as the result of experiences gained by the engineers during that period, a great deal was done to perfect transmission, and so to open out the possibilities of long-distance telephony. Development since the war has proceeded at a greater pace, and communication can now be obtained with practically all the important cities of Europe.

Mr. Camp spoke of the method of charging which obtains; and explained that a proportion of the fees were allocated to each country concerned. The operating procedure was then dealt with, and in mentioning the high standard by which telephonists with language qualifications are judged, Mr. Camp compared the staff of the Foreign Section very favourably with other branches of the Civil Service where foreign languages are required.

The meeting concluded with a very hearty vote of thanks to Mr. Camp for his interesting lecture.

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THE

Telegraph and Telephone Journal.

VOL. XIV. FEBRUARY, 1928. No. 155.

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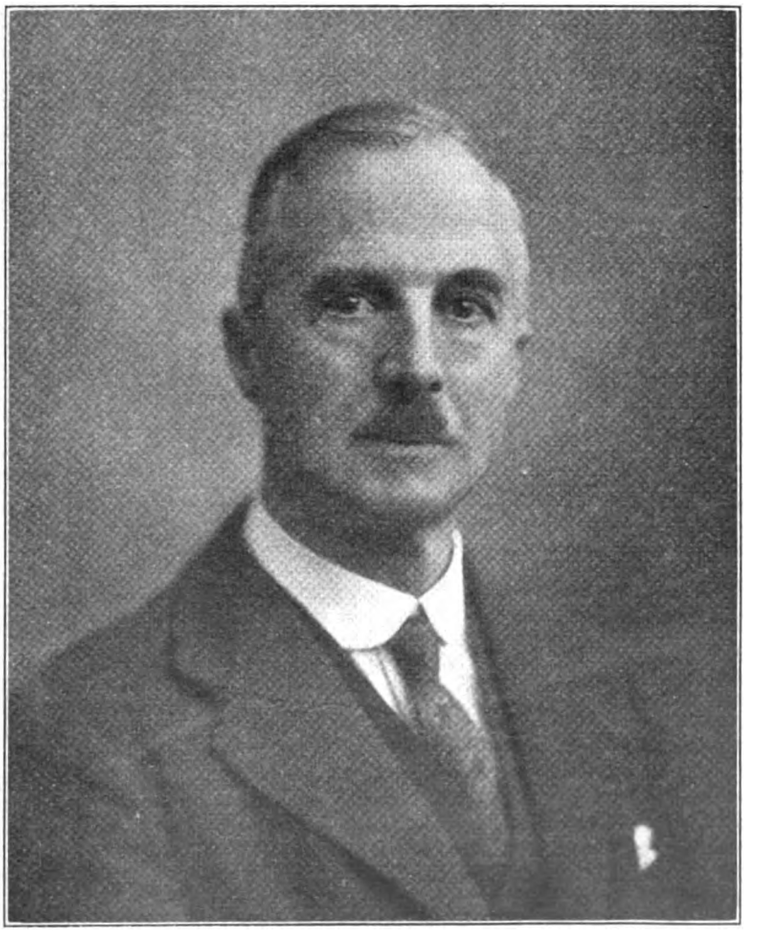
TELEGRAPH AND TELEPHONE MEN AND WOMEN.

XLIX.

MR. P. F. CURRALL.



MR. P. F. CURRALL, whose portrait we offer to our readers, was born in 1870, and entered the service of one of the companies amalgamated with the National Telephone Company in 1886. At the time of the transfer of the Company's system to the Post Office at the end of 1911 he was District Manager at Dublin, a position which he occupied until 1916, when he was transferred to Brighton to act in a similar capacity. There he remained for five years, seeing the Brighton system expand in that period from 10,000 to 23,000 stations. He was promoted in November, 1921, to the important District Managership of Birmingham, where he still remains. During his period of office, the telephones in the Birmingham district have grown from about 34,000 to upwards of 57,000.

A sufficient testimony to Mr. Currall's sound business ability will be found in the important posts which Mr. Currall has occupied.

He takes great interest in the various Staff social events and holds the opinion that these play an important part in the welfare and happiness of the Staff.

He does a considerable amount of reading. His outdoor recreations are motoring and, of course, golf.

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"WHAT'S IN AN EXCHANGE NAME?"

THE subject of the naming of exchanges was dealt with very fully by Mr. Maycock in the December 1920 issue of this Journal. It is certainly a little startling to realise that so long ago as seven years we were preparing in such detail for the coming of automatics, but our inquiries on the subject had then gone little beyond the theoretical stage and perhaps a few notes on the practical application of the principles enunciated in that article may be not without interest.

In case the reader has not by him the article referred to I will repeat here, with some alteration, the conditions which govern the selection of exchange names. They are as follows:—

(*a*) The name must not have the same numerical equivalent as any existing or recommended name of an exchange within the 10-mile circle from Oxford Circus (i.e., the London Automatic Area).

(*b*) It must be phonetically satisfactory—not likely to be confused with an existing name.

These are the two essential conditions *sine qua non*. Others, to conform with which is highly desirable, are:—

(*c*) It should possess some topographical significance.

(*d*) It should be euphonious and free from unpleasant associations.

To these must be added two conditions, the observance of which experience recommends.

(*e*) It should not possess the same numerical equivalent as the name of any exchange which the London subscriber may believe to lie within the 10-mile radius.

(*f*) It should not offend local susceptibilities.

In regard to the last point, there is more feeling than would have been expected on the subject. We should hardly suppose, judging from what we are allowed to know of the attitude of the subscriber towards his telephone and his exchange, that he would attach any aesthetic or associational value to the name of the latter. But so it is. Gerrard and Avenue have already gathered round them a tradition and confer a certain cachet upon the subscribers privileged to put those names on their note-paper headings. It is different with others. The National Telephone Company once had an exchange called Deptford, and the subscribers on this exchange, most of whom were in the New Cross area, thought the name of that ancient and historic borough too plebeian for the inhabitants of the genteel suburb of New Cross, so they petitioned and had it changed. Quite recently a new exchange was opened at Fulham; the area covered almost precisely the area of the Metropolitan Borough of Fulham. It is surprising how many people who live in Fulham think or wish it to be thought that they live in Kensington; but in this case the Department had more courage than its predecessor and insisted upon the proper topographical appellation.

These, of course, are minor complications. The great difficulty in searching for a name is when the natural local name does not fulfil the conditions (*a*) and (*b*) above.

The names ruled out by condition (*a*) are quite definite, but the second condition is by no means so clear-cut or sharply defined as the first. It is known that some names are easily confused with others in transmission over a subscriber's circuit and even more so over an order wire, but it is not always clear what are the real causes of the confusion, and it cannot be accurately determined what combinations of vowels and consonants are most likely to be mistaken for other combinations. Thus, observations extending over a prolonged period gave the following list of cases where errors due to phonetic similarity were most frequent:—

Exchange Name.	Confused with:—
Bank	Park.
Brixton	Western, Richmond.
Bromley	Wembley.
Chancery	Hornsey.
Chiswick	City.
Dalston	Merstham, North.
East Ham	Merstham.
Eltham	Elstree.
Hampstead	Wanstead.
Hop	Park.
Hornsey	Molesey.
Kensington	Kingston, Paddington.
Kingston	Kingsbury, Kensington.
Kingsbury	Kingston.
Malden	Molesey.
Merstham	Dalston, East Ham, Western.
Mitcham	Richmond.
Molesey	Hornsey, Malden.
North	Park, Dalston.
Paddington	Kensington.
Park	Bank, Hop, North.
Richmond	Brixton, Mitcham.
Romford	Wanstead.
Sidcup	Sydenham.
Streatham	Sutton, Sydenham.
Sutton	Streatham.
Sydenham	Sidcup, Streatham, Tottenham.
Tottenham	Sydenham.
Wanstead	Hampstead, Romford, Woodford, Watford.
Western	Merstham, Willesden.
Willesden	Western.

N.B.—Some of these names have now disappeared, but they illustrate the difficulty.

It appears clear from this table that it is the vowel sounds which are most to blame for the mistakes made. The confusion is aided by the careless way in which those sounds are usually produced in English as compared with most other languages, with the result that several distinct sounds are represented by the same symbol while different symbols have precisely similar sounds (e.g., the "i," the "e," and the "u," in the words "sir," "serpent," and "surname," have identical sound values which I believe could not happen in any other language). Referring to the list above, the *i*, *o* and *a* in "Brixton," "Bromley" and "Chancery" are so near in sound to the *e* and *o* in "Western" and "Hornsey" that the close similarity of the respective consonants makes confusion easy. The second point that strikes one is that amongst the consonants that form the framework for the vowel sounds the labials are much less useful in creating a distinctive pronunciation than the dentals.

Another point brought out is that two syllable names are better than one and three than two. In the above list 67% of our one-syllable names, 52% of our two-syllable names and only 22% of our three-syllable names are confused with others. (For this purpose Sydenham, Tottenham and Willesden are treated as two-syllable names which, for all practical purposes, they are, as the current pronunciations are "Syd-n'm," "Tot-n'm" and "Will's-den.")

As, therefore, we have no definite rules which will enable us to avoid names liable to misunderstanding, every name proposed is subjected to the series of careful tests which were described in Mr. Maycock's article.

If no local names can be found to meet the essential conditions, an arbitrary name must be selected. This should preferably be a word indicating some abstract quality which may be applied to or suggests some aspect of the service which will be given (e.g., Progress, Reliance). If such a word cannot be found the only remaining qualification which can be applied is euphony.

An exhaustive search has been made of dictionaries and encyclopædias and by this means a vast collection of names was found which fulfil condition (*a*). The next step was to withdraw

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all those names which, though otherwise admissible, were unsuitable for a London Exchange, e.g., for different but perhaps obvious reasons, such names as Inability, Hoang-ho and Trotzky are not looked upon as possible names. These processes of elimination left a few thousand words, most of which, however, though possible, were decidedly unattractive. Further elimination left a few hundreds and as a final result, after the testing process, we have about 32 arbitrary names which have passed satisfactorily the phonetic tests and which can be drawn on when none of those having any associational value is admissible.

These preliminary considerations being disposed of, some account of the progress since the research method was introduced will perhaps be interesting. During that time names have been found for 74 new exchanges, while 7 existing exchange names have been changed (to meet the automatic conditions). Forty-one names have been chosen for exchanges projected but not yet opened, and as far as can be seen at present about 33 more will be needed for exchanges still in the stage of being planned.

Of the success of the system, the 48 selected names which are already in use (including two, Latchmere and Broadway, which have disappeared) may give some indication, little difficulty having arisen in connexion with any of them. It may be interesting to examine these a little more closely. Twelve of the names (Addiscombe, Wallington, Upper Warlingham, Upminster, Elstree, Eltham, Chislehurst, Fulham, Hayes, Hendon and Malden) are those of the borough or urban or rural district, or of the ancient village, now a suburb, which they serve. Eight (Albert Dock, Harold Wood, Havering, Mill Hill, Seven Kings, Primrose Hill, Clerkenwell and Colindale) are place names well known in the district. Sixteen (Bishopsgate, Chancery, Fitzroy, Waterloo, Broadway, Latchmere, Grosvenor, Langham, Maryland, Maida Vale, Popesgrove, Rodney, Sloane, Ravensbourne, Clissold, Buckhurst) are the names, frequently derived from the original manors, of streets, squares, rivers, &c., in the district. Two (Toll and Tandem) have been chosen for us by the Americans and the remaining 10 (Ambassador, Frobisher, Franklin, Kelvin, Royal, Reliance, Speedwell, Riverside, Grangewood and Mountview) are quite arbitrary. Of these names, Speedwell is perhaps a model of what an arbitrary name should be. It is phonetically good. The name itself is a pleasing one, with charming associations and yet not vulgarised by too copious use as the name of a suburban villa, and in addition, it contains within itself a suggestion of the kind of service which is to be expected from the exchange. Reliance has somewhat similar advantages. It is comfortable and optimistic. Ambassador is attached to what, if any, diplomatic quarter existed in London, would carry that title. Kelvin commemorates the name of our great man of science in what is pre-eminently the scientific quarter of London, South Kensington.

Grangewood and Mountview please the local authorities of East Ham and Hornsey respectively (as far as they could be pleased when losing their proper names) while Frobisher, Franklin and Royal are arbitrarily selected. If it be asked, "Why Franklin and Frobisher?" the answer must be that the names of such great Londoners as Shakespeare, Chaucer, Jonson, Dickens, Thackeray, Browning, Milton, Carlyle, Addison, Sheridan, Goldsmith, Siddons, Kemble, Rossetti and many others, clash numerically with existing names, and so do Tennyson, Coleridge, Shelley, Ruskin and Raleigh.

A list of the Exchanges already planned and named, but not yet opened, will further illuminate the subject, and will no doubt be of interest for other reasons.

Area.	Name Agreed.
Bayswater	Bayswater.
Beckenham	Beckenham.
Bermondsey	Bermondsey.
Castlebar	Perivale.
Chingford	Silverthorn.
Cricklewood	Gladstone.
Croydon Relief	Fairfield.
Ditton	Emberbrook.
East Finchley	Tudor.
Euston	Euston.
S. Kensington	Exhibition.
Hackney	Amherst.
Harold Wood	Ingrebourne.
Holloway	Archway.
Ilford Relief	Valentine.
Kentish Town	Gulliver.
King's Cross	Terminus.
Leyton	Leytonstone.
Maida Vale (Relief)	Abercorn.
Mansion House	Mansion House.
Merton	Merton Abbey.
Monument	Monument.
Norbury	Pollards.
Norwood	Livingstone.
Shepherd's Bush	Shepherd's Bush.
Stamford Hill	Stamford Hill.
Strand	Temple Bar.
Wandsworth Road	Macaulay.
Whitehall	Whitehall.
Woodside Park	Hillside.
Wood Street	Metropolitan, National, Empire.

Croydon once had a Fairfield and the road which led to it still bears that name. It will be remembered that Mr. Gladstone spent many week-ends at Dollis Hill, in the neighbourhood of Cricklewood. Ditton has running through its meadows a tributary of the Thames, known in its upper reaches as the Mole, but here as the Ember. Hackney was largely built upon the ancestral estates of the Amherst family, and the new suburb of Harold Wood is watered by a little brook bearing the romantic name of Ingrebourne. In the immediate vicinity of Ilford is an ancient manor and a beautiful public park known as Valentines. In Wandsworth Road, the area covered by which includes a large part of Clapham, occurs the one happy case where we are able to commemorate the name of its most famous resident. (It will, however, be impossible to commemorate Carlyle or Rossetti in Chelsea; Ruskin or Browning in Camberwell or Coleridge in Highgate.) Part of the great estates of the Duke of Abercorn fall within the district of the Maida Vale Relief Exchange. Leyton has been given the name of its junior suburb, Leytonstone, on account of the poor transmission value of its proper name, and it is, perhaps, fitting that the great exchanges rising on the immense site at Wood Street, in the heart of the City, should bear the resounding names of Metropolitan, National and Empire.

Silverthorn, Tudor, Gulliver, Hillside and Livingstone are purely arbitrary, while the remaining names explain themselves.

H. C. CORNER.

THE G.P.O. PLAYERS' DRAMATIC SOCIETY.

THIS Society encourages a high standard in Dramatic Art. Following on its successful production last October of "R.U.R.," pronounced by a dramatic critic to be one of the three outstanding service productions of the year, it has now selected for presentation "The Chinese Puzzle" (by Marian Bower and Leon M. Lion), a drama of diplomacy and Oriental mystery.

Dr. Neville Whymant, preeminent as an authority on Asiatic languages, and but recently returned from many years in the Far East, is very kindly lending his services to ensure accuracy of detail and of local colour.

The production, under the direction of Major Hodgson-Bentley, Founder and Director of the Southend Repertory Theatre, will take place at King George's Hall, Caroline Street, Gt. Russell Street, W.C. (two minutes from Tottenham Court Road Tube Station), on Friday and Saturday, Feb. 17 and 18, commencing at 7.30 p.m. Tickets, 5*s.* 9*d.*, 3*s.* 6*d.*, 2*s.* 4*d.* (all reserved), may be obtained from the Hon. Treasurer, Mr. J. Scott (Room 12, 3rd Floor), G.P.O. North, E.C.1.

THE numerous friends of Mr. John Macfee, late Telephone Superintendent for Scotland and District Manager, Edinburgh, and who is now resident in Harrogate, will be glad to hear that he is making a satisfactory recovery after undergoing a serious surgical operation. The recovery has been so well maintained that a few weeks should see a complete restoration to health.

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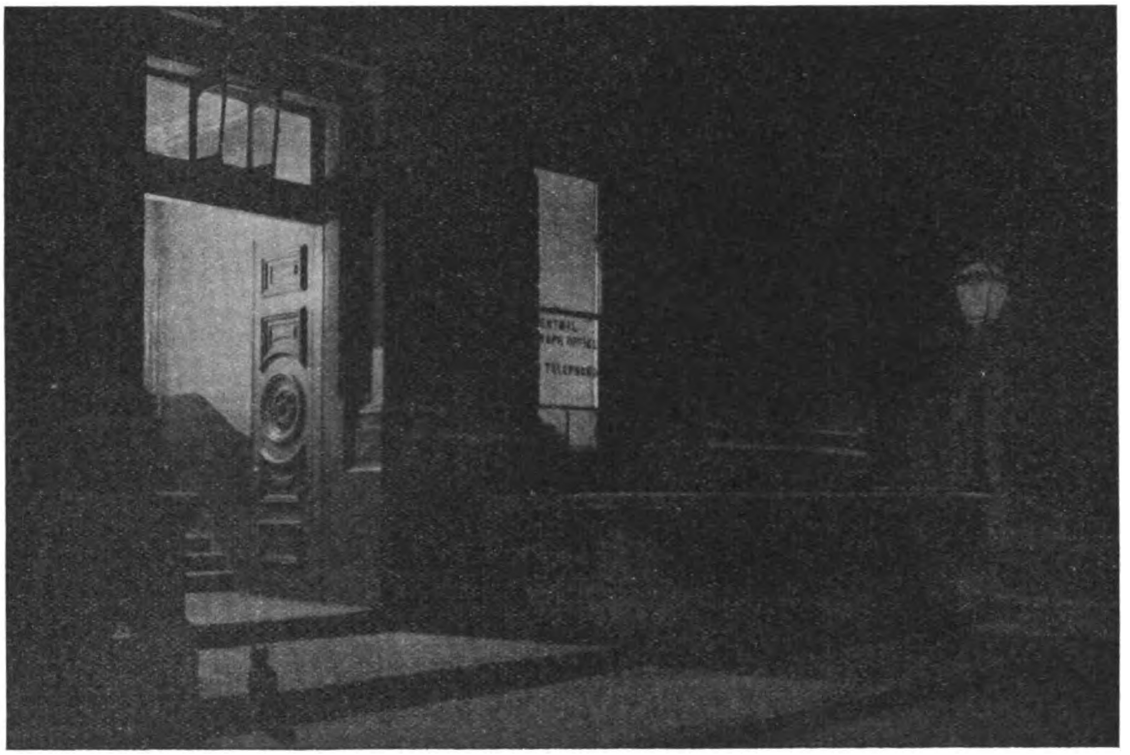
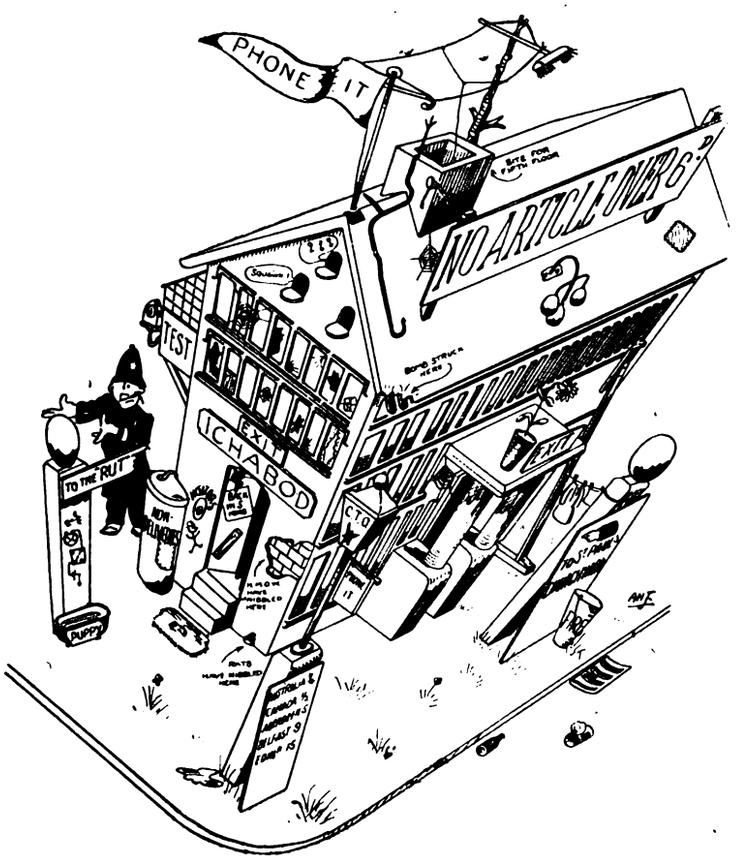


[*Reproduced by the courtesy of "St. Martins-le-Grand."*

"THE EVER OPEN DOOR." BY F.A.C.

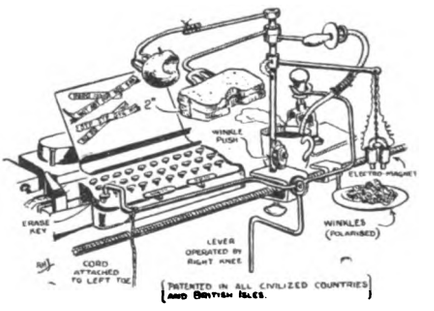


WORMS-EYE VIEW OF THE C.T.O. OR AS SEEN BY AN OFFICER SUFFERING FROM RULE 60.

A STEREOSCOPIC VIEW CAN BE OBTAINED IF THE PICTURE IS HELD HORIZONTALLY IN A GOOD LIGHT, THE LEFT EYE BEING PLACED AT BOTTOM LEFT-HAND CORNER. THEN SEE AN OCULIST. YOU HAVE ASTIGMATISM.

ARTISTS GAY AND GRAVE IN THE C.T.O.

PROPHETS, with dispositions of the gloomiest, may prognosticate the early decease of Telegraphy as a craft, and committees may sit on it—in more ways than one—but the sturdy good-humour and the versatile talent of the telegraphists of the C.T.O. remain very potent factors in giving practical evidence of the vitality of the present as of the past generations of telegraphists. As witness of this, the Christmas and New Year's greetings from the Supervising Officers and Staff of the "F" Division is again to the fore, and is again from the pen of the inimitable Mr. A. H. Johnson. The "card" this year contains eight pages of humorously descriptive matter and sketches descriptive of the C.T.O. present and future. Thanks to the



kindness of the artist who has loaned the blocks, we are able to publish two —No. 1, A worm's-eye view of the C.T.O.; No. 2, A peep into the future of mechanised telegraphy, when provision will be made for the automatic feeding of the operators during their non-stop eight hours duty!

Of a somewhat graver type of art, and one which reflects a very definite faith in the future, as in the present—need for a telegraph service of twenty-four hours per day 365 days of the year—is No. 3, a night-effect photograph entitled, "The Ever Open Door," by Mr. F. A. Christopher, of the Overseas Telegraph Room, C.T.O.

The reproduction of this work of art which we have obtained has been made possible by the courtesy of the Editor of *St. Martin's-le-Grand* and the artist who, it may be recalled, was awarded a bronze medal by the G.P.O. Arts Club.

It is recorded that a lady shed tears at the sight of the cat, but was reassured when she heard that the photo was taken on a warm summer night.

J. J. T.

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TELEGRAPHIC MEMORABILIA.

AUSTRALIA.—Reuter's Sydney correspondent cabled that, "after a remarkable week of relaying through the Sydney station (2FC) every night between 10.30 and 11.30 p.m., when people throughout the State listened and danced to music from London, Christmas morning's re-broadcast was disappointing owing to the unsuitable hour—1.15 to 2 a.m."

The *Daily Guardian* (Sydney) reports that Australian manufacturers are becoming alarmed at the dumping of American sets upon the Commonwealth market at considerably under cost price. A meeting of Sydney radio manufacturers was held recently, and steps are being taken to form an Australian Radio Manufacturers' Association, with the main idea of protecting the home radio industry.

AUSTRIA.—The revival of Austria, now happily another factor towards the world's post-war recovery, is further evidenced by the inauguration, on Dec. 21 last, of the new wireless-telegraph service between Vienna and Constantinople.

To this may be added the fact that radio "taxpayers" numbered 287,197 on Dec. 1, 1927, of whom 200,428 were in Vienna; the latter figure includes 282 dealers. According to *World Radio*, over 97% of the city subscribers paid only 2 schilling per month, about 3*d*. per week.

Most of the Berlin newspapers on Dec. 1 published photographs telegraphed from Vienna. It was the first day of the new public service, and Prof. Carolus, the inventor of the process, states that "we can now telegraph a picture post-card size, in 10 minutes." The cost is 8*s*. for this size.

BELGIUM.—By arrangement with the Belgian Telegraph Administration the Western Union Telegraph Company has now been permitted to open offices of its own in both Antwerp and Brussels, where it receives and delivers transatlantic messages direct from and to the public. The service, it is understood, is exclusively for the Company's transatlantic traffic, and for use in connexion with their direct Americo-Belgian communication extended via the British land lines, the Anglo-Belgian cables and the Belgian land lines.

It is understood that teletype working on the direct London and Brussels telegraph circuit has passed beyond the experimental stage.

CANADA.—*World Radio* states that there are approximately 200,000 receiving licences in force. The radio branch of the Department of Marine and Fisheries has instructed radio inspectors to call upon all operators of receiving sets and to prosecute those who do not possess licences. A similar Dominion-wide "drive" was made last year.

CORSICA.—The Chamber of Commerce of Ajaccio considers that the two existing cables between Corsica and France have become insufficient, and is urging the French Government to lay another combined telegraph and telephone cable between the island and the mainland.

DENMARK.—While Prof. William Rung, of the Polytechnic Academy, Copenhagen, was seeking with his wireless set at night to tune in the Copenhagen broadcasting station, he unexpectedly heard an unknown station with a wavelength evidently near 350 metres, and heard a lecture in Danish, giving the impression of being well-considered propaganda. The Danish Government's Radio Council has started a search for the station, which is believed to be either on the Baltic coast or on board a vessel.

It is stated in London that the directors of the Great Northern Telegraph Company propose to issue new shares to an amount of £500,000, which will be ceded to a trust company. The latter will issue to the shareholders of the Great Northern Co. its shares to the extent of £450,000—equivalent to one £3 share for each £10 share of the Great Northern Co. now held. The scheme will come before a meeting of shareholders shortly.

EGYPT.—Early last month the Anglo-Egyptian wireless service was transferred to the Marconi Company in London and to the Marconi Radio Telegraph Company of Egypt in Cairo. The Abu Zabal wireless station, near Cairo, has been acquired by the latter company, and will in future be used only as a transmitting station, while a new wireless receiving station has been constructed at Meadi, a few miles to the South of Cairo, to provide a high-speed duplex service, enabling messages to be sent in both directions simultaneously.

Both the transmitting and receiving stations in Egypt are connected by special land lines to a new central telegraph office in the city of Cairo, where all operating processes will be carried out by remote control. The transmitting equipment at the Abu Zabal station now comprises a long-wave and a short-wave transmitter, and two additional transmitters for use with beam aerials are in course of erection. At the English end the Marconi Company is providing two additional beam transmitters to the equipment at the Dorchester beam station specially for the London-Cairo wireless service.

FRANCE.—It seems that the shelving by the Chamber of the proposed duty of 10 francs on wireless sets will affect the service much more than appeared at first sight. M. Bokanowski, who, as Minister of Posts and Telegraphs, is responsible for the control of broadcasting, lets it be understood, says *The Times*, that, unless the Chamber takes up the duty again at the second reading of the Finance Bill, the greater part of the musical and theatrical programmes of the French stations must be suppressed. Hitherto, it appears, the stations, most of which belong to the Government, have been able, in the absence of any law protecting authors' copyright, to transmit musical and theatrical performances without paying any royalties. A Decree issued last December put a stop to this state of affairs, and the new *régime* is to come into force at the end of this year. The new tax was to provide the Government with funds with which to pay the royalties.

Some of the private stations cannot survive the New Year, as the high taxes the Government propose to levy on them are exorbitant, states the Paris technical Press. The proposal was to raise the tax to ten francs. The decision to tax private transmitters and receivers was the principal recommendation of the Departmental Commission set up in Paris under the broadcasting reorganisation decree of Dec. 26, 1926.

According to *World Radio*, "Radio-Paris will blossom where other stations fade." This high-power station is going to have a new studio in a few days' time, and the power is going up to 20 kw.

Commenting on this condition of affairs, the Paris correspondent of the *Daily Telegraph* writes: "There are few of the principal countries in Europe where broadcasting is so backward as in France. The trouble is due to the difficulty of reaching a decision on the character of broadcasting—whether it should be a State monopoly or whether it should have a sort of controlled liberty." In order to effect improvements in the service a clause was inserted in the Budget imposing new taxes, but the Opposition tried to force a debate on the matter, with the result that the Wireless Clause was separated from the Finance Bill. This appears to have sent the Wireless Clause adrift and the present situation appears to be that the Wireless Telephony Act passed in 1926 is nullified by this non-ratification by Parliament. No resources are available, and in view of this precarious situation the Government has decided not to give authority for establishing private posts, but to submit to Parliament a bill for raising the necessary funds. As matters now stand, the existing private broadcasting stations may disappear before July 1 next.

The situation is further complicated by the action of authors and composers, whose works were broadcast without royalties being paid.

Broadcasting in France, adds the *Telegraph's* correspondent, requires to be completely overhauled, and much curiosity is felt as to the ultimate decisions of Parliament.

Reuter's Trade Service informs us from Paris that the manufacturers and traders in the radio-electrical industries in Strasburg have decided to form a syndicate of the radio-electrical industries to group manufacturers, traders, and Strasburg radio representatives. This body will extend its activity to the departments of the Upper and Lower Rhine.

A statue of the late M. Emile Baudot, the inventor of the well-known telegraph instrument bearing his name, was recently unveiled in the courtyard of the French General Post Office in Paris, Rue Grenelle.

GERMANY.—The *Deutsche Bergwerks Zeitung* says that producers of radio material in Germany are at present very busy. Orders from the trade, which were not very large in the autumn months, are now increasing. Difficulties are already beginning to arise at some factories in completing orders in the specified time, especially as supplies of raw material are sometimes not so quickly obtainable. It is generally estimated that Christmas business this year will exceed that of last year. Cheap simple sets and expensive luxury sets are especially required; medium quality sets are not much in demand.

The number of German receiving licences issued reached 2,000,000 on Dec. 15, 1927, an increase of 250,000 on the September figure.

Stations under construction and those projected are to be fitted with wooden aerial masts instead of the usual steel ones, says *World Radio*, as a result of the Munich station's success with this type of aerial support. The previous aerial system radiated only about 20% of the energy fed into it. When the steel masts were replaced by wooden ones, by way of less height, the percentage rose to 63%.

On the other hand, as will be seen from the following paragraph, the very latest German station still employs steel.

What is described as the most powerful station in Western Europe, was opened on Dec. 20 by the Minister of Posts. It is at Zeesen, 20 miles south of Berlin, and will be used in place of the present Königswüsterhausen. Its transmitting power is 40 kw., and its wavelength 1,250 metres. The aerial is carried by two 700-ft. high steel masts.

GREAT BRITAIN.—Among the developments in connexion with the new London Air Port at Croydon, officially opened on Jan. 9, is the provision of an entirely new wireless station, which is being erected for the Air Ministry by Marconi's Wireless Telegraph Co., Ltd., to replace the one that has done duty there for the last seven years. The new station will consist of a group of four 3-kw. transmitters, operated in conjunction with a direction-finding receiver. The transmitters will be capable of serving for telephony and continuous-wave and interrupted-continuous-wave telegraphy, the wave range being from 800 to 2,000 metres, and independent drive circuits will be incorporated to maintain constancy of frequency and wavelength. Energy for the transmitters is to be supplied by a common motor-alternator group, the power from which may be switched on to any of the transmitters. The new direction-finding receiver has selective characteristics, and incorporates filtering and amplifying devices; it will be arranged so that, if required, two or more circuits can be operated on different wavelengths for the reception of telephony and telegraphy on the same aerials. In order to keep the neighbourhood of the aerodrome as free as possible from obstruction, the

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wireless masts and transmitters are being erected two or three miles from the air port and operated on the remote control system.

The B.B.C. has issued an interim report on the tests which have been carried out at the Daventry experimental station (5GB) during the past four months of working; it is as follows: When the station replaced the local Birmingham transmitter in August, 1927, a single low aerial was installed, but after a short trial it was found that the fulfilment of one of the main objects of the new station, namely, the provision of an adequate signal for Birmingham, could not be guaranteed. The reason was that shielding occurred from the masts of the long-range Daventry station (5XX), and therefore a second low aerial was erected in parallel to the first, designed to radiate in the Birmingham direction, considerable improvement being effected in the signal strength from the double aerial over the Birmingham area.

Having in mind the provision of data in connexion with the scheme of regional stations, the B.B.C. proceeded to erect masts, 300 ft. high, which it was thought might ultimately replace the low double masts; experiments have recently been carried out with the new masts, but it appears that the shielding effect in the Birmingham direction is likely to be accentuated by their use. The next step, therefore, will be to rearrange the 300-ft. masts in such a way as to maintain the present signal strength in Birmingham, while giving greater all-round strength to that portion of the rest of the country which is within range of 5GB. Until it is possible to guarantee that the field strength in Birmingham from the higher aerial is on its lowest terms as great as it is to-day, the 300-ft. masts will not be brought into regular service. The general efficiency of the new aerial has been definitely proved to be greater than that of the twin aerial at present functioning, and the experiments for which it is adapted will be of ultimate value in connexion with the regional scheme.

Statistics published in the *Wireless Trader* show that during October the total value of radio apparatus exported from this country was £93,476, including valves £15,760. Australia was the principal customer, taking goods to the value of £11,746 (valves £5,220); Poland was a close second with a total of £11,142 (valves £1,232). Other important customers were the Netherlands, £7,448 (valves £364); Japan, £6,383 (valves £1,069); Canada, £4,922 (valves £473); and the Irish Free State £4,402 (valves £944).

The Royal Meteorological Society is to be congratulated, remarks the *Electrical Review*, on having appointed a committee of experts to investigate the problem of atmospherics, more especially with reference to forecasting the weather. The popular theory that they are the result of electrical disturbance caused by thunderstorms seems to be open to doubt, and it may be that the real origin of certain atmospherics is as yet utterly unsuspected. The investigation is to continue.

The number of broadcast radio-telephone receiving licences in force in Great Britain at the end of December, 1927, was 2,383,726, plus 11,448 issued free to blind listeners. The increase for the month of December was nearly 30,000 and the total increase for 1927 was 216,915 new listeners.

The Marconi International Marine Communication Co., Ltd., and the Radio Communication Co., Ltd., have come to an agreement to amalgamate their operating and inspection services, says *The Times*. A joint service department of the two Companies has been organised under the name of the British Wireless Marine Service, which will in future deal with all matters relating to the appointment of operators to ships, the organisation of marine telegraph traffic, the fitting, maintenance, and repair of ships' wireless installations, and the provision of wireless service depots for ships in all parts of the world.

An "Exide" Research Scholarship has been established at Manchester University, available for fourth-year students willing to undertake original research work at the Physical Laboratories of the University, under Professor W. L. Bragg, F.R.S. The scholarship this year has been awarded to Mr. J. A. Darbyshire, who is carrying out, for the Exide Battery Company, some original research on lead oxides.

The Wireless Telegraphy Board has issued specification No. K201 for Neon Lamps (H.M. Stationery Office, price 2*d*. net) which has been prepared to meet the requirements common to the Royal Navy, Army, and Air Force. It covers technical requirements and tests, such matters as packing, marking, delivery, &c., which are not common to the services, not being specified. *Inter alia*, writes *The Electrical Review*, the current passed through the lamp as soon as the striking voltage causes a visible discharge must not exceed 4 mA under any condition; the capacity when measured at a frequency of 2,000,000 cycles per second must be between 2.5 and 3 micro-microfarads, and a life of 2,000 working hours is expected. The lamp is intended to be suitable for use as a high-frequency voltage indicator in wavemeters.

HOLLAND.—I understand, says the wireless correspondent of the London *Daily Telegraph*, that PCJJ, the well-known Dutch short-wave station formerly at Eindhoven, is now again transmitting from its new site at Hilversum. It will be recalled that the station was closed for six weeks to permit the transfer of plant and re-erection at Hilversum. It will transmit regularly on Tuesdays and Thursdays on the old wavelength, namely, 30.2 metres, from 6 p.m. to 9 p.m. Greenwich time.

INDIA.—The report of the Indian Institute of Science, Mysore, shows that one of the subjects of active research at the Institute during the past year was that of wireless telegraphy, the investigations being conducted under the direction of Prof. J. K. Catterson Smith. Continuous measurement of radio-signal strength has been made and new apparatus is under construction for extending the scope of three experiments as part of a general study of wireless transmitters; portable apparatus for measuring the modulation of radiation from a telephone transmitter has been constructed, short-wave circuits have been examined, and experiments on the damping of shock-excited radio circuits have been conducted. Anti-atmospheric properties displayed by a combination of frame-coil receivers have been investigated and distortion in audio-frequency transformers has been analysed by the cathode-ray oscillograph.

A special correspondent of the *T. & T. Journal* in India informs us that it has been decided to work the wireless telegraph circuit between Madras and Rangoon by means of Wheatstone in future, thus replacing the ordinary Baudot system which it is considered could be improved upon. It should however be noted that only an ordinary Baudot installation has been tried and not the Baudot-Verdan system recently described in this *Journal*, the latter not being available outside Europe.

ITALY.—The Department of Overseas Trade learns from a reliable source that Royal Decree Law No. 2,539,2,207, dated Nov. 17, 1927, published in the Rome *Gazetta Ufficiale*, No. 287, of Dec. 13, contains new regulations for the purpose of improving and developing broadcasting services in Italy. The measure provides for the institution of a higher committee of control at the Ministry of Communications, amends the conditions under which concessionary rights are granted, revises the charges for licences, and provides for special subscription rates for communes, organisations, and private individuals.

The Rome correspondent of the *Westminster Gazette* states that under a new decree, the subscription to the Italian National Broadcasting becomes obligatory for hotels and social clubs, tax ranging from £1 to £15 a year, according to their category.

All communes with over 1,000 inhabitants must also contribute to the National Radio Union, a contribution ranging from 10*s*. a year to £200 for large cities.

A fund of $25,000 (the income from which will be applied each year to post-graduate work in an American university of an electrical engineer from Italy) has been established by individuals, associations and corporations in the United States who are interested in electrical development, it has been announced by the Italy American Society. The fund has been raised to mark the one hundredth anniversary of the death of Alessandro Volta, and the student who will go to the United States will be selected competitively by the Associazione Elettrotecnica Italiana. In the United States the administration of the fellowship is in the hands of the Italy American Society.

MAURITIUS.—Reports from Port Louis state that the Christmas greetings from the British Broadcasting Corporation were easily heard in Mauritius at 10 p.m. on Dec. 25. Listeners also heard Australia on the same night.

NEW ZEALAND.—"New Zealanders," cabled a correspondent of the *Westminster Gazette* on the 4th ult., "danced to the music of 2 LO re-broadcast from Sydney last night."

PALESTINE.—There are thirty-two telegraph offices in Palestine. The length of telegraph wire on Jan. 1, 1926, was 1,429 miles; during 1925, a total of 307,165 messages were sent, and the gross revenue for that year was $143,515. The investment in the telegraph plant is given as $117,755 by an American technical journal.

PHILIPPINE ISLANDS.—The *T. & T. Age* informs us that the Philippine Government telegraph cable lines were recently repaired, a shipment of some 25 miles of submarine cable having been received by the insular Bureau of Posts from London, England. The greater portion of the new cables will be used to replace the old ones between Manila and Iloilo and Cobu in the Visayan Islands.

PORTUGAL.—Experts have arrived at Lisbon to arrange for the linking-up by radio-telephony of Madrid and Lisbon with North America, *via* London, reports Reuter's Lisbon agency.

RUSSIA.—Reuter's Trade Service, Moscow, informs us that crystals for wireless sets are now all imported into the Soviet Union. The radio-technical laboratory of the Institute of Applied Mineralogy and Metallurgy, however, after many experiments, has invented a crystal approaching imported crystals in effectiveness. The experiments are being continued, and the laboratory hopes to be able ultimately to produce a crystal that will do away with the necessity for importations.

SCOTLAND.—A new type of fire alarm has been installed by the Edinburgh Fire Brigade at six outside centres as an experiment. The alarm is contained in a box erected at a street corner, and is connected with telephone instruments at the central fire station, says *The Times*. Anyone wishing to report a fire must break a small pane of glass in the box; that causes a door to open automatically, exposing to view two apertures. Above one are printed the words, "Wait; fireman will speak," and above the other, "Reply here." With the smashing of the glass there is given simultaneously an alarm ring at the fire station, and the fireman on duty replies through the ordinary telephone transmitter, his voice being amplified in the street box, and can be heard 12 ft. away. The person reporting the fire then gives the necessary information through the other aperture. It does not appear to simplify matters so far as a dull Southerner can understand the arrangement!

SOUTH AMERICA.—Marconi short-wave "beam" services are now in operation from England to New York and South America, i.e., Rio de Janeiro

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and Buenos Aires, the New York service supplementing the long-wave services which have been operated from the Marconi main telegraph office at Radio House, London, for some years. The South American services are entirely new, and place Brazil and the Argentine in direct wireless communication with London for the first time. The "beam" service operates both to and from Rio de Janeiro, but at present Buenos Aires has no "beam" aerials, so that while messages are sent from London by "beam" to Buenos Aires, there is no "beam" in the reverse direction. The services are operated from Radio House by remote control, the transmitting stations for the North and South American services being situated at Dorchester, and the receiving station at Somerton, about 30 miles from Dorchester. They are normally worked at between 100 and 200 words a minute, although over 300 words a minute have been worked quite satisfactorily during tests. The transmitting aerials at Rio de Janeiro have been so constructed that London, Paris, and Berlin will be within the "beam" when it reaches Europe, and the Rio stations can handle traffic for all three capitals. "Beam" receiving aerials are now being built near Paris for receiving from America, but none are yet in existence in Germany.

SWEDEN.—The Swedish Government Telegraph and Telephone Department estimates the revenue for 1927 at 86,360,000 kronor, which means an increase of 4% compared with the previous year. The surplus of income over expenses will amount to 19,100,000 kronor, thus representing an interest of 6.3% on the capital invested, which amounts to 310,000,000 kronor.

Reuter's New York agency reports that telephone conversation between New York and Stockholm, Sweden, was inaugurated on Nov. 29 by Count Adolf Hamiltonm, delegate to the recent Radio Conference, and is expected to be the beginning of a regular telephone service to Sweden. Similar services have been established to Antwerp and Brussels, but *calls to Paris have been difficult owing to the poor land wires.* [The italics are mine.]

Swedish registered listeners on Dec. 31, 1927, numbered 330,000, or 54.43 licences per 1,000 of the population.

According to *World Radio*, the Swedish Telegraph Board intends to increase the power of the Malmö and Göteborg stations from 1 to 10 kilowatts and to build a new medium-power station in the southern part of Sweden. Experiments for working more stations on the same wavelength continue; two small relay stations, one in the north and the other in the south, are already worked in this way.

SWITZERLAND.—A committee of experts has been summoned to meet early in 1928, to finish the technical examination of the question of the establishment of a League of Nations wireless station. In December, 1926, the Council asked the Committee on Communications and Transit to undertake immediately the necessary studies in order that the League might have at its disposal a sufficiently powerful wireless station to enable it to communicate by its own means with the greatest possible number of member States of the League, and to present a report to the Council so soon as possible on the subject. The Committee of Experts now summoned will determine in particular the essential features of a station to meet the League's requirements, the expenditure on building and upkeep, and general conditions of operation from technical and administrative points of view. On receiving the report the Transit Committee intends to establish a draft budget for the equipment of the station, to invite tenders from firms which, if necessary, might undertake the construction, calculate the possible extent of the traffic, and lay down the terms of the agreement necessary with various public or private wireless undertakings as regards the conditions of the exchange of traffic. It will be possible to submit the final report of the Transit Committee to the Council in 1928. The Committee of Experts is composed as follows:—Mr. Einthoven, wireless engineer at The Hague; General Ferrie, director of the military wireless organisation in the French War Ministry, president of the International Committee for Wireless Telegraphy; Dr. Jaegers, adviser in the German Postal Ministry; Colonel Lee, of the British General Post Office; and Prof. Vallauri, of the Royal Naval Academy, Livorno.

The Geneva correspondent of the London *Times Engineering Supplement* on the matter of general telegraphic communication between Geneva and London, in its issue of Dec. 31, writes as follows:—"The Council of the League of Nations has just been asked to report on the question of telegraphic communications between Geneva and London. Messages destined for the British Empire, the United States, Latin-America, and the Far East are all transmitted through London whither journalists accredited to Geneva direct their telegrams in order that they may be re-transmitted to their final destinations. In recent months and particularly during the naval conference the inadequacy of means of communication became very evident and brought about delays in the transmission of news generally. The channels at present are the Marconi Wireless Telegraphic Station at Berne, which is frequently affected by atmospherics, and the Geneva-Paris lines with automatic re-transmission to London in Paris. The establishment of a new line consisting of a direct wire between Geneva and London would constitute a real remedy for the present inconvenience. Arrangements would have to be made between the postal authorities of the three countries interested, namely Great Britain, France, and Switzerland. Sir Austen Chamberlain has promised to set negotiations on foot for this purpose." It should be noted that this does not refer to and must not be confused with the League's desire, mentioned above, to have a world-wide range wireless installation in order to be in a position at any time to communicate with all or any one of the League member States. The matter mentioned by *The Times* is that of better public telegraphic communication between London and Geneva.

The *Electrical Review* mentions that a demonstration took place at Geneva on Dec. 8 of the reception of broadcast photographs, drawings and manuscripts by means of new apparatus stated to cost less than the average three-valve receiver. This system, which has not yet been shown publicly in England, is an ingenious adaptation by Captain Fulton to the technique of broadcasting of a process invented by Mr. Thorne Baker, and used 15 years ago for the transmission of pictures by telephone wire between London and Manchester. The feature of the new system, which employs an electromagnetic method of synchronisation and records the images by electrochemical action, is that it can be manipulated by the average listener and thus differs from the more complex systems which, so far, have been used only for point-to-point transmission. Captain Fulton, says *The Times*, had both the transmitting and receiving apparatus in full view of his audience. The electrical impulses from the transmitter were relayed by telephone lines to the Geneva broadcasting station, some five miles distant, and the signals from that station were received in the demonstration hall on an indoor aerial. Under their influence the receiver traced with striking fidelity a counterpart of the original photograph. A portrait of postcard size was broadcast and received in four minutes, the middle tones being surprisingly well reproduced.

TURKEY.—It is reported by the *Financial Times* that the new radiotelegraph station at Angora has been carrying out tests with London recently and that it is hoped to establish regular communication in January, 1928. Has anyone heard it yet in Great Britain? Or is Constantinople intended?

A high-speed direct duplex wireless service was inaugurated by the Marconi Company between London and Constantinople on New Year's day.

U.S.A.—The recent statement in the House of Commons with regard to the losses incurred by the British Post Office on the transatlantic telephone service was read with much interest in New York. The American Telephone & Telegraph Company has also found the service not a paying proposition, but has announced that the service will be continued in spite of the fact that the loss incurred by it is relatively larger than that sustained by the G.P.O.

Mr. L. D. Batson, of the U.S. Department of Commerce, points out that telephone broadcasting services are now provided by 431 stations in 57 foreign countries, in addition to the 685 operating in the United States and its non-contiguous territories: Europe has 196; North America outside the United States, 128; South America, 52; Asia, 18; Oceania, 28; and Africa 9. The division of stations by countries gives Canada 59; Cuba, 47; Russia, 38; Sweden, 30; Australia and Germany each, 24; Argentina, 22; United Kingdom, 20; France and Mexico each, 18; Spain, 15; Brazil, 12; Chile, 9; Finland, 7; Switzerland, 6; and Austria, 5. There are four each in Belgium, Czecho-Slovakia, Uruguay, India, Netherlands East Indies and New Zealand; three each in Italy, Poland, China, Japan and South Africa; two each in Denmark, Estonia, Hungary, Irish Free State, Norway, Portugal, Bolivia and Algeria; and one each in Iceland, Latvia, Lithuania, Luxemburg, Netherlands, Turkey, Yugo-Slavia, Costa Rica, Haiti, Paraguay, Peru, Venezuela, Ceylon, Chosen, Kwangtung, Straits Settlements, Canary Islands, Egypt, Morocco and Tunisia.

Despite the pressure upon space—as usual!—one cannot refrain from quoting the experience of the *Daily Telegraph* wireless correspondent on the afternoon of Jan. 16 in connexion with the opening of the Pan-American Conference.

"I heard," said he, "upon picking up the receiver at Savoy Hill, orchestral music from Havana, Cuba, for Keston the listening post of the B.B.C. had picked up a short-wave broadcast from Schenectady and had transferred it to London by a telephone trunk line."

"Afterwards the reception was reproduced on a loudspeaker and we were able to hear part of President Coolidge's speech and the Cuban President's speech."

This was indeed an historic occasion for broadcasting whatever it may prove to be in other directions. The distance covered must have approached 5,000 miles, for the route was Havana to Key West; Key West to Schenectady by trunk land line; Schenectady to Keston by short-wave transmission and trunk underground line Keston to Savoy Hill.

The short-wave broadcast was made by 2XAD on 21.7 metres, with, of course, daylight reception.

Since our last issue there has been enough written in the Press on Beam *v.* Cables to fill quite a few numbers of the *T. & T. Journal*. As was to have been expected, all that was written was not well-informed, and extraneous matter, such as the dividing of all code words into groups of five instead of ten letters as is at present the international rule, has been introduced as though this were fundamental to the relative values of radio and cable telegraphy.

The *Electrical Review*, writing on electrical progress in 1927, in its New Year's Eve issue, said: "One of the most notable events in the history of telegraphy was the opening of commercial wireless communication between Great Britain and Australia on the 'beam' system, early in the year, followed by further developments, which have brought wireless and cable telegraphy into acute competition. Both types are essential to the national and Imperial welfare, and the controversial questions which have arisen are now receiving serious consideration on the part of the Government and the companies concerned."

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In their financial columns this same periodical gave a table showing the position of cable and wireless stocks in December, 1927, as compared with the same month in 1926, thus :—

Company.	Dec., 1928.	Dec., 1927.
Anglo-American Pref.	101	93½
Eastern Extension	17⅞	15
„ Telegraph	177½	145
Globe Ordy.	18½	14⅜
Great Northern	27	38¼
Indo-European	47½	40
Marconi	13/9	37/6
Western Telegraph	17¼	14

However, since that date the Eastern and Associated Telegraph Companies and Marconi's Wireless Telegraph Co., Ltd., have made the following announcement :—

"Sir William Plender, on behalf of the Eastern & Associated Telegraph Companies, and Sir Gilbert Garnsey, on behalf of Marconi's Wireless Telegraph Co., Ltd., have been asked to co-operate with a view to making a joint report for submission to their respective boards as to a possible arrangement in the joint interests of the respective companies."

As these lines go off to the printer the definite announcement appears that "an Empire conference on cable and wireless communication has been summoned" and that "Sir John Gilmour, Secretary for Scotland, will preside over the conference and will be assisted by Mr. A. M. Samuel, Financial Secretary to the Treasury. Canada, Australia, New Zealand, South Africa and the Colonies will also be represented."

Having placed on record just a few particulars of a situation which may well turn out to be a most important juncture in the history of long-distance telegraphy in general and British Empire telegraphy communication in particular, there for the present, *sub judice*, the matter rests.

From Imperial to matters of more local interest and note that, on Jan. 10 at a meeting of the Institute of Post Office Electrical Engineers was an unusual, possibly an unprecedented, presentation to the Institute by Mr. F. A. B. Lord, of Messrs. W. F. Dennis & Co., of a number of films showing the manufacture of telephone and power cables at the works of Messrs. Felten & Guilleaume, and the laying of the Anglo-Dutch submarine cable from Domburg to Aldeburgh in 1926 by the cable ship *Neptune*. The total weight of the cable is 1,700 tons, is of the 4-quad type with a centre core.

It is extremely sad to have to record the tragic death of the much respected Mr. Docwra, late Asst.-Supt. of the C.T.O., who had only retired from active service about eighteen months. It appears that while attending to a faulty pipe in the roof of his house he fell into the cistern, was unable to extricate himself and was thus accidentally drowned.

Of the passing of Miss J. Anderson, an ex-Supervisor who retired in 1896, there is a fast-diminishing number in the service who would be likely to recall one who was of the old Electric Telegraph Company of 1861. Yet another link with the early days of T.S. Mrs. Paffard, wife of Mr. A. C. Paffard, who survives her, has also gone over to the great majority. The deceased lady left the service nearly 50 years ago upon her marriage.

To those who may read these three notifications and be in a position to communicate with any of the respective relatives, I have been commissioned to broadcast the very real sympathy and affection from the members of the C.T.O. Retired Supervising Officers' Society.

The additional post of one Superintendent, Higher Grade, for the Cable Room and Wireless Floor of the C.T.O. has been a welcome step. To this post Commander E. L. C. Grattan, D.S.O., R.N., late Asst. Inspector, Class I, Wireless Telegraph Establishment Secretary's Office, has been appointed, as from Jan. 1, 1928. The Commander is to be congratulated, for he has youth on his side !

To Mr. F. S. J. O'Shaughnessy, whose provisional appointment as an additional Superintendent to the Cable Room has now been confirmed as from Dec. 15 last, heartiest congratulations to one who has undoubtedly laboured hard and earnestly through the many difficulties of the past year or two.

Yet further hearty congratulations, and these to Mr. R. L. McLachlan and Mr. G. W. S. Austin, who take up the posts respectively of Asst. Superintendent and Overseer, Cable Room.

To Messrs. E. M. Draper, promoted to Superintendent, Lower Grade, Inland Telegraphs, C.T.O., and the sequential promotees Messrs. W. M. Knight and H. Young, Asst. Supt. and Overseer, also sincere felicitations.

Now comes the writer's penitential note, for to nothing but the fault of the writer can I ascribe the postponement of any reference to the retirement of Mr. G. F. Mansbridge, O.B.E., who, entering the C.T.O. as a telegraphist in 1886, soon became engrossed in the technical side of telegraphy and himself became teacher and lecturer in Electricity, Telegraphy, Mathematics, &c., passed into the Stores Department in 1895, and steadily rising, eventually became Vice-Controller of that department, which high post he held till his retirement last year. That he may have a lengthy and peaceful retirement, in the garden he loves so well and in company with those roses for which he has so great an affection, always presuming that the lure of Condensers and Inductance Standards will not intrude too heavily upon his spare (?) time is the sincerest wish of all his old C.T.O. associates.

Then again, there was the retirement of friend Farrar from the chargeship of North Walsham Repeater Office, where the co-operation of himself and staff with the Overseas Telegraphs has been a continuously happy feature for years. To Mr. Farrar a happy and lengthy retirement, and to his successor, Mr. T. Parker, whose excellent reputation has preceded him, a hearty welcome.

The January number of *St. Martin's-le-Grand* contains an excellent reproduction of a watercolour drawing, by the much respected Arthur G. Ferard, formerly of the Secretary's Office, of a "Courtyard at Palma de Mallorca." Also an article entitled "Side-Lights on the Washington Radio-telegraph Conference," over the well-known initials of F. W. P., through which the kindly humour of that personality cannot help but shine, as, for example, "Used Ford's from 30 dollars up ! Even a civil servant might be able to afford £6."

Transition.—In an age of transition it is the *direction* of the thoughts and aims of men which constitutes the radical difference or agreement between them rather than the exact *distance* that each may have travelled on the same road.—Seebohm on More.

J. J. T.

A BRIEF CHRONOLOGY FOR STUDENTS OF TELEGRAPHS, TELEPHONES AND POSTS.

By HARRY G. SELLARS.

(*Continued from page* 93.)

1815	Soemmering, at Paris, exploded gunpowder by means of electric current passing through a cable laid at the bottom of the River Seine.
1816	Semaphore invented by Sir Home Popham erected on the roof of the Admiralty Office, London.
	Steam communication established between Holyhead and Howth by means of the "Hibernia."
	Ronalds laid, at Hammersmith, an experimental underground telegraph line composed of a copper wire enclosed in glass tubes encased in wooden troughs, and devised a telegraph system.
	Andrew Crosse, electrician, said, "I prophesy that, by means of the electric agency, we shall be enabled to communicate our thoughts instantaneously with the uttermost ends of the earth."
	Compass needles in London pointed 24 deg. 27 min. *west* of the true north.
1816, Oct. 28 ...	Earl of Chichester and the Marquis of Salisbury appointed joint holders of the office of Postmaster-General.
1816, Dec. 13 ...	Ernst Werner von Siemens born at Lenthe, Hanover.
1818, Jan. 6 ...	Post Office opened in Dublin.
1818	Post Office took action against the keeper of the "New England" Coffee House for illegally collecting letters. Offender paid a penalty of £5 and expressed regret and action was withdrawn.
	Compass needle pointed 24 deg. 41 min. west of the true north pole.
1818, Dec. 24 ...	James Prescott Joule born at Salford.
1819	Oersted discovered that a needle could be deflected by the current passing through an adjacent coil, or conductor. (Oersted = Unit of reluctance or magnetic resistance.)
1819, Sept. 18 ...	Jean Barnard Leon Foucault born.
1819, Nov. 30 ...	Cyrus West Field born.
1820	Ampère, or Lyons, developed electro-dynamics and demonstrated the relation between magnetism and electricity. (Ampère = Unit of electric current.) Before the Paris Academy of Sciences, he described a telegraph system in which signals would be indicated by a small magneto placed under wires corresponding to the alphabet. He also devised a galvanometer.
	Ampère, Arago and Davy, working independently, discovered how to magnetise iron and steel by circulating currents of electricity round them in spiral wire coils.
	Dyer introduced a telegraph system.
	Letters for East Indies, Cape of Good Hope, Ceylon and Mauritius allowed to be sent otherwise than through the Post.

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Arago found that iron filings are attracted to a wire carrying a current.

Dr. Ure, of Glasgow, caused muscular movements in executed criminals by passing electric currents through the bodies.

1821 ... ... Pearson, of Boston, U.S.A., invented the "Domestic Telegraph," an apparatus with two dials and needles.

J. S. C. Schweigger, following Oersted's experiment, produced a "multiplier" composed of many turns of wire which increased the effect of the current on the needle.

Peter Barlow improved the mariners' compass and fixed the magnetic susceptibility of iron at 32.8 units.

1821, Aug. 31 ... Hermann Ludwig Ferdinand von Helmholtz born.

Ampère, prompted by Laplace, and following Oersted's discovery in 1819, suggested that a telegraph apparatus might be constructed composed of needles which, deflected in certain directions, would indicate different letters of the alphabet. He discovered that conductors carrying electric currents repelled or attracted each other, according to the direction of the currents.

Faraday showed how a magnet could be rotated by means of an electric current.

Seebeck produced electricity by heating pieces of copper and bismuth which had been soldered together.

First steamship used in the Mail Service—the "Lightning"—ran between Holyhead and Dublin.

1822 ... ... Seebeck discovered that a current can be produced in a closed circuit made up of two dissimilar metals, if the point of contact is heated.

Poisson stated that the powers of magnetic crystals would vary according to their positions.

Uncollected revenue due from certain postmasters, and other officers "cleared off by a warrant under the Royal Sign Manual."

1823 ... ... British Government declined an electrical telegraph system, preferring to rely on the semaphore.

Sir Francis Ronalds set up a telegraph system in which the transmitting and receiving apparatus consisted of circular brass plates on which were inscribed letters, figures and instructional words for the operators. In front of each plate was a disc with an aperture which allowed one letter and its corresponding figure or sign to be visible. The plates rotated by clockwork at the rate of one revolution per minute, the same letter being displayed simultaneously at both ends. A cylinder electrical machine charged the line as desired and the divergence of a pair of pith balls in front of the disc indicated to the receiving operator that the letter or sign visible at that moment has to be recorded. Ronalds made valuable suggestions as regards laying underground wires, and was the first to foresee difficulties arising from "capacity."

Lord Salisbury died and Lord Chichester became sole Postmaster-General. Only one person at a time has held the office since that date.

Karl Wilhelm Siemens born.

Sturgeon, of Whittington, Lancashire, published his work on electro-magnetism.

1824, June 26 ... William Thomson (afterwards Lord Kelvin) born at Belfast.

Gustave Robert Kirchhoff born at Königsberg.

1825 ... ... Sturgeon invented and named the electro-magnet.

An Act of Parliament allowed newspapers to pass free of charge through the post.

Mrs. Somerville demonstrated the polarity of a needle magnetised by violet rays.

1826 ... ... Quetelet, at Brussels, showed variations in atmospheric electricity in varying climatic conditions.

Matteucci showed experimentally the possibility of producing inductive effects by sudden discharges of static charges.

Matteucci and Nobili demonstrated that muscular contractions of human beings produce discharges of electricity.

1826, Feb. 16 ... Lindley Murray died.

Nobili discovered that peroxide of lead was deposited upon the anode during the electrolysation of a solution of lead.

1827 ... ... Action taken against Coffee Houses illegally collecting letters, but withdrawn on payment of the penalty.

Money Orders for Ireland printed on large forms so that a letter could be written thereon and postage reduced.

Le Baillif and Becquerel noticed that repulsion took place between antimony and the pole of a magnet.

1827, Mar. 5 ... Count Alessandro Volta died.

Snow Harris was the first to construct an electrometer for measuring the attraction between an electrified and a non-electrified disc. He also introduced a Unit Jar for measuring the charge of a battery.

Ohm defined the electrical law that the strength of a current in a circuit varies directly as the electro-motive force and inversely as the resistance. (Ohm = Unit of electrical resistance. Mho = Unit of electrical conductivity.)

1828 Sir Humphrey Davy invented an "Electrical Renewer," or relay, for strengthening current on line wires.

Joseph Wilson Swan born.

Joseph Henry improved Sturgeon's electro-magnet by using many turns of insulated wire.

Lord Crawford devised an electro-magnet.

De Haldat discovered that iron filings adhered to those portions of a steel plate which had been "written on" with the pole of a magnet.

Bidwell calculated the attractive power of an electro-magnet and the magnetic permeability of various metals.

Mitchell introduced the "double touch" method of producing bar magnets.

Tommasi claimed to have magnetised steel bars by passing hot steam round them in a spiral tube.

Cromwell Fleetwood Varley born.

1828 Dec. 22 ... William Hyde Wollaston, died.

1829 ... ... Bohnenberger introduced a Gold Leaf Electroscope with one leaf.

Fechner of Leipzig modified the electroscope of Bohnenberger.

Gaugain invented a discharging gold leaf electroscope.

Terquem proved that gold leaves in an electrified cage did not diverge.

Fechner proposed a telegraph system in which 24 needles and 48 wires were required to transmit the alphabet. He suggested that the effect at the receiving station might be increased by enclosing the needles of the needle telegraph apparatus in coils. (Schweigger had already done this in his galvanometer.)

There were 564 postmen in London and the "villages" of Islington, Camden Town, Kensington, Brompton, &c.

Committee of Revenue inquiry found Money Order Office being carried on as a private business by Messrs. Stow and Watts, and recommended that the Post Office should take control and any revenue which accrued.

1829, Sept. 4 ... Thomas Waghorn conveyed letters to India via Paris, Trieste, Alexandria and Suez.

1829, Sept. 23 ... General Post Office transferred to a new building in St. Martin's-le-Grand designed by R. Smirke.

1830 ... ... Wohler devised a battery with two plates of aluminium dipping into nitric acid and caustic soda, respectively.

Humboldt caused the muscles of fish to contract by passing currents through them, and drew attention to the fact that magnetic storms influence the compass needle.

Pouillet supervised the construction of an electro-magnet in Paris.

Professor Ritchie, of the Royal Institution of London, exhibited a telegraph system composed of 26 wires with 26 suspended magnetic needles, each surrounded by a coil of wire.

1830, Nov. 11 ... Mails carried by rail for the first time (between Liverpool and Manchester).

1830, Dec. 14 ... Duke of Richmond became Postmaster-General of Great Britain, and on April 14, 1831, was appointed Postmaster-General of Great Britain and Ireland.

1831 ... ... H. Pixii produced a machine for generating alternating electric current by the rotation of a horseshoe magnet with its poles near the core of a fixed electro-magnet.

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Faraday introduced the "molecular" hypothesis of electricity and established the theory that induction is the result of polarisation of the particles of the medium separating the inducing body from the body on which it acts. He discovered that currents can be induced in a closed circuit by bringing a magnet near to it, and that a current of changing strength may induce a secondary current in an adjacent circuit.

Joseph Henry found that variations in the strength of an induced current could induce currents in a third closed circuit, that variations in the induced current in this third closed circuit could induce currents in a fourth, and so on.

Melloni made a thermo-electric pile composed of antimony and bismuth.

Nobili devised an astatic galvanometer using Schweigger's "multiplier" and two magnetised needles of equal strength fixed in parallel positions with opposite poles adjacent.

1831, April 28 ... Guthrie Tate born.

1831, June 13 ... James Clark Maxwell born.

1831, July 3 ... Edmund Yates born.

David Edward Hughes born.

Henry introduced a telegraph system in which the received current actuated the armature of an apparatus producing audible sounds arranged according to a code. He also built an electro-magnetic engine.

Melloni and Nobili constructed a thermo-multiplier.

Sir J. C. Ross found the magnetic north pole in Boothia Felix.

Separate Irish Post Office and Postmaster-General abolished.

Deputy Postmaster-Generalship of Scotland abolished.

Money Order Office in Ireland given to Mr. Lees in exchange for a Clerkship of the Munster Road.

1831, Nov. 24 ... Faraday's discovery of magneto-electricity announced to Royal Society.

1831, Feb. 13 ... Last man executed for stealing letters.

Professor Jackson experimented in electrical signalling.

1832, June 17 ... William Crookes born.

Charles Tilston Bright born at Wanstead, Essex.

James Wimshurst born in London.

1832, Oct. ... Morse, on a voyage from Europe to America, conceived the idea of an electro-chemical telegraph. Dr. Jackson, of Boston, gave him considerable assistance.

(In first Morse printer signals were recorded by chemical decomposition caused by current passing from platinum points which came into contact with paper moistened with acetate or carbonate of lead, or impregnated with turmeric and moistened with sulphate of soda.)

Pixii, following Faraday's discovery, constructed a magneto-electric machine, and included a commutator so that direct currents could be produced.

1833 ... ... Gauss and W. E. Weber erected a magnetic observatory at Göttingen and inaugurated a Magnetic Association. (Gauss = Unit of magnetic intensity.)

Gauss published the theory and method of measuring the intensity of terrestrial magnetism, and the strength of a magnetic pole.

Pixii, Clarke and Saxton generated alternating electric currents by revolving bobbins of insulated wire rapidly in front of steel magnets, a commutator rotating with the bobbins so that the generated currents passed in one direction.

Ritchie produced an electro-magnetic engine.

William Sturgeon introduced a galvanic motor.

S. Hunter Christie invented the instrument for comparing electrical resistances, now called the "Wheatstone Bridge."

Gauss and Weber, at Göttingen, devised a mirror galvanometer.

Gauss and Weber used an unequal telegraph alphabet in which the number of signals transmitted to represent any letter or figure did not exceed four. The alphabet introduced by Morse bears a strong resemblance to that of Gauss and Weber.

1834, Feb. 15 ... Sir William Preece born.

Peltier found that a current of electricity passed through a junction of dissimilar metals heated or cooled the junction, according to the direction of the current. He devised an electroscope and an electrometer.

Mrs. Mary Somerville published "The Connexion of the Physical Sciences."

Anthony Trollope entered the service of the Post Office.

Eduard Friedrich Weber devoted himself to magnetism and electro-dynamics.

Sir Charles Wheatstone determined experimentally the velocity of electricity.

Lenz thought the magnetism of an electro-magnet was proportional to the current and the number of turns in the coil. He concluded that, in all cases of electro-magnetic induction, the induced currents have such a direction that their reaction tends to retard the motion which produces them. Poggendorff introduced the "Bichromate" cell consisting of plates of carbon and zinc immersed in a solution of bichromate of potash and sulphuric acid.

1835 ... ... E. M. Clarke produced an electric gas lighter which was really a miniature electrical machine. He also invented a direct current magneto-electric machine.

(To be continued.)

RETIREMENT OF MR. F. H. HUGGINS: SOUTHAMPTON TELEPHONE DEPARTMENT.

A LARGE number of his colleagues met together on Jan. 4, to bid farewell to Mr. F. H. Huggins, Higher Clerical Officer, who is retiring on age limit after 39 years' service.

The District Manager, Mr. O. G. Lee, presented Mr. Huggins with a handsome cheque—a token of the high regard in which Mr. Huggins was held by the staff. Mr. Lee, in the course of a short speech, commented on the valuable assistance that Mr. Huggins had given him and said that he had found him to be a sincere and honest worker. The District Manager also mentioned Mr. Huggins' splendid sick record, and, in concluding, wished Mr. Huggins and his wife the best of good luck and future happiness and health.

Mr. C. S. Weston, Staff Clerk, followed and briefly outlined the many changes which have taken place in the telephone service during Mr. Huggins' long career. A point of particular local interest was that Mr. Huggins had witnessed the growth of the Southampton Telephone District from about 3,000 to 37,500 stations. Mr. Weston expressed thanks for the great help Mr. Huggins had given him and wished him long life and health.

Mr. A. L. May, Traffic Superintendent, offered his very best wishes.

Mr. Huggins, in replying, thanked the staff for their tangible expression of esteem and said how much he appreciated the kind words which had been spoken. He said he would always look back with pleasure to his association with the Southampton Telephone Staff.

The presentation closed with three hearty cheers for Mr. Huggins.

NOT A "FEATHER BED" PIRATE.

". . . . , who was fined £5 at . . . for maintaining a wireless set and evading the requisite fee, was stated to have dismantled his aerial and attached a crystal set in the bedroom to a wire mattress. The signals were stated to be exceptionally clear."

The foregoing extract from one of our contemporaries shows some of the subterfuges adopted to avoid the payment of wireless licensing fees and, indirectly, the difficulties of detecting "pirates." It is a strange world where people will go to all this trouble to avoid paying one-third of a penny for an evening's entertainment and an unrelenting fate which finally increases the cost tenfold.

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REVIEWS.

"The Elements of Telephone Transmission." By H. H. Harrison, M.I.E.E., M.I.R.S.E. (Published by Longmans, Green & Co. Ltd., London. vii + 147 pp. Price 5s., net.)

This book is stated to be "designed for the elementary student to whom the present text-books form somewhat difficult reading." The author assumes no mathematical knowledge beyond the elements of algebra and geometry, and endeavours to give a brief survey of the whole subject, including the necessary mathematical groundwork. Unfortunately, however, the task which he has set himself is one which is practically impossible. In his first chapter he endeavours, in 36 pages, to give the reader a knowledge of logarithms, the differentiation of algebraical, exponential and trigonometric functions, binomial theorem, exponential series, trigonometrical series, vector algebra and polar co-ordinates. As a series of notes by which a reader who has already done a considerable amount of mathematics may refresh his memory, this chapter is excellent, but we are afraid that no elementary student could possibly work through it without considerable assistance from a teacher. The method of presentation also is not helpful. In paragraph 26, for example, the symbol + is first used for the ratio of a geometrical progression and then for the radius of a polar curve.

In the same article the angle which the radius of this curve makes with the datum line is first denoted by θ, then by x, again by θ, again by x, then again by θ and finally again by x.

In paragraph 14 the author gives a graphical demonstration of the differential coefficient of Sin x. This demonstration is quite good, but at the end the author puts in the quite unnecessary and, for the beginner confusing note, that x is in radians and not in degrees, forgetting that the trigonometrical functions of a given angle are unaltered whatever units we chose to employ for expressing the magnitude of the angle.

Similar remarks apply to the remaining chapters, which deal with the theory of alternating currents, electromagnetic wave transmission and practical transmission conditions.

The reader who brings a trained mind to the book would derive much useful information from it, but we could not advise the unaided elementary student to use it as a text-book. The difficulties experienced in studying such a concentrated presentation of the subject are not lessened by the lack of orderly presentation of ideas which frequently occurs.

"The Cable and Wireless Communications of the World." By F. J. Brown, C.B.E., M.A., B.Sc. (Lond.), late Assistant Secretary of the Post Office. (Pitman and Sons. Price 7s 6d. net.)

Mr. Brown possesses an almost unique knowledge of cable and wireless matters and in this book we obtain the full advantage of that knowledge, couched in that lucid, vigorous and simple language which is characteristic of the author. Free from technicalities, but rich in accurate historical, geographical and financial information, this book enables one to obtain a complete bird's-eye view of the present position from the perusal of a mere 146 pages.

On the financial side Mr. Brown is handicapped by the fact that the published accounts of the British Marconi Company and the Radio Corporation of America do not distinguish between the service and manufacturing sides of their business, and, as he puts it, "any attempt to examine the general financial position of wireless communication with these companies omitted would be like "Hamlet" without the "Prince of Denmark."

We may hesitate to accept the conclusion that the wireless services ought to be content with the lower paid traffic while the cable services absorb all the higher paid traffic, or the underlying assumption that wireless messages will always be subject to interference and interception. We may even quibble at the statement that long-distance telephone communication between Great Britain and the more distant Continental countries is hardly a practical proposition so far; but these are relatively small matters compared with the advantage of the treatise as a whole. Those interested in long-distance communication will welcome the addition of this volume to their bookshelves.

PROGRESS OF THE TELEPHONE SYSTEM.

THE total number of telephone stations working at Nov. 30, 1927, was 1,587,493. New stations added during November numbered 21,709, and ceased stations 9,976, resulting in a net increase of 11,733 on the total at the end of October.

The growth for the month is summarised below:—

	London.	Provinces.
Telephone Stations—		
Total at Nov. 30	561,364	1,026,129
Net increase for month	4,657	7,076
Residence Rate Subscribers—		
Total	126,183	203,111
Net increase	1,770	2,226
Call Office Stations—		
Total	5,039	18,279
Net increase	32	132
Kiosks—		
Total	729	3,339
Net increase	31	111
Rural Party Line Stations—		
Total	—	10,138
Net increase	—	48
Rural Railway Stations connected with Exchange System—		
Total	—	843
Net increase	—	12

The number of inland trunk calls dealt with during October—the latest statistics available—was 8,583,262, an increase of 709,736, or 9%, on the total for October, 1926.

Calls made to the Continent during October numbered 30,587, and from the Continent 32,774, representing increases of 23% and 19.8% respectively on the October 1926 figures.

Further progress was made during the month of December with the development of the local exchange system. New Exchanges opened included the following:—

LONDON—Toll (additional), Hatch End, Merstham.

PROVINCES—Southport (automatic), Birkdale (automatic), Southwick (automatic), Bearsden, Rickmansworth,

and among the more important exchanges extended were:—

LONDON—Croydon, Kelvin, Popesgrove, Thornton Heath, Wanstead, Wimbledon.

PROVINCES—Colchester, Giffnock, Godalming, Morley, Bank (Liverpool), Waterloo (Liverpool), Sale, Shettleston, Shrewsbury (automatic), Winchester.

During the month the following additions to the main underground system were completed and brought into use:—

Northampton—Stony Stratford,
London—Amersham,
Bradford—Skipton,

while 82 new overhead trunk circuits were completed and 93 additional circuits were provided by means of spare wires in underground cables.

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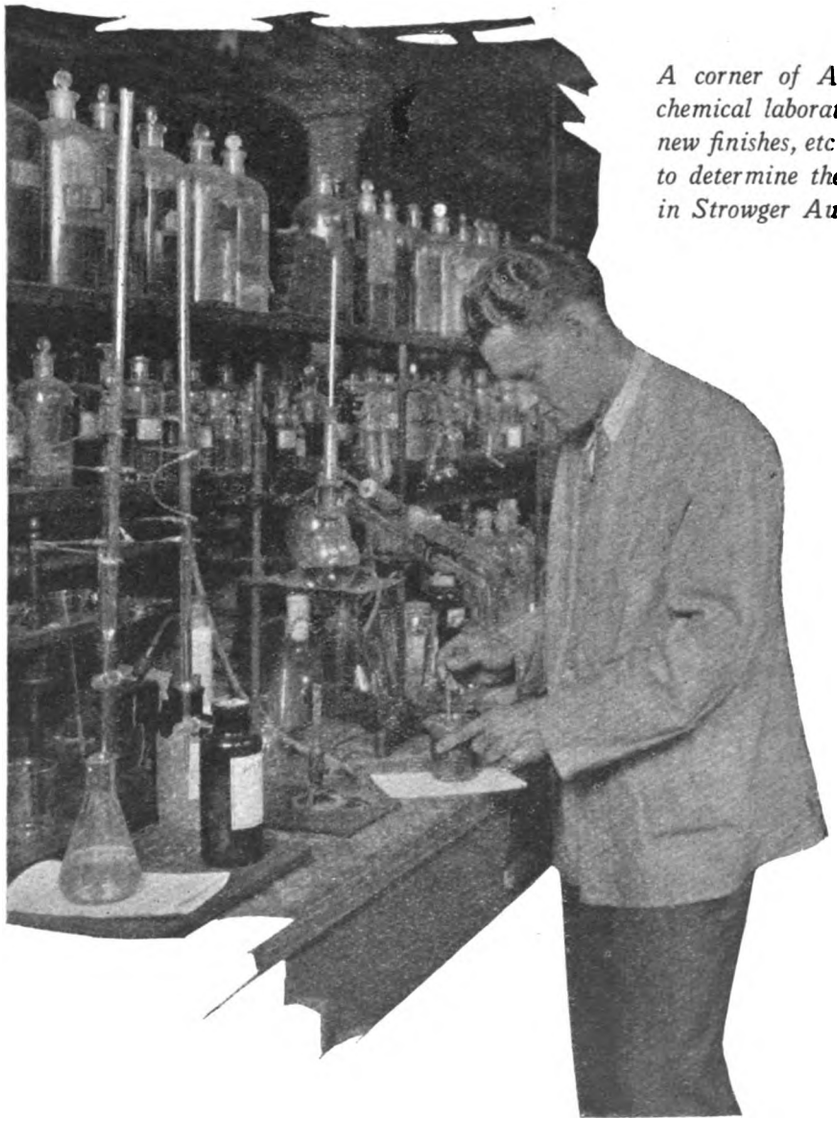

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The
Telegraph and Telephone Journal.

PUBLISHED MONTHLY IN THE INTERESTS OF THE TELEGRAPH AND TELEPHONE SERVICE, UNDER THE PATRONAGE OF THE POSTMASTER-GENERAL.

Editing and Organising Committee - - - J. STUART JONES. W. D. SHARP. J. F. STIRLING. W. A. VALENTINE. J. W. WISSENDEN.

Managing Editor - - - W. H. GUNSTON.

NOTICES.

As the object of the JOURNAL *is the interchange of information on all subjects affecting the Telegraph and Telephone Service, the Managing Editor will be glad to consider contributions, and all communications together with photographs, diagrams, or other illustrations, should be addressed to him at the G.P.O. North, London, E.C.*1. *The Managing Editor will not be responsible for any manuscripts which he finds himself unable to use, but he will take the utmost care to return such manuscripts as promptly as possible. Photographs illustrating accepted articles will be returned if desired.*

VOL. XIV. FEBRUARY, 1928. No. 155.

RURAL TELEPHONE SYSTEMS.

Now that the telephone system is well established, not only in every city, borough, county town, manufacturing town, and pleasure resort in Great Britain, but also in every fair-sized market town and in all the larger villages, the Post Office has to go to remote and unfrequented places when it seeks new worlds to conquer—places unknown and unseen even by the experienced traveller unless perchance he catches a glimpse of their distant spires from the passing train. Upwards of 140 new exchanges were opened by the Post Office in 1927, and almost all of these were of the rural type, representing in many cases an answer to the appeal of some parish council or some rural clergyman, acting as the spokesman of his flock, for the extension of the indispensable telephone to their village. When a minimum of eight subscribers can be obtained, the Post Office generally rises to the occasion and takes the risk of providing an exchange, thus placing even the sleepiest and most unprogressive hamlet in direct touch with the great world. We may venture to doubt whether a commercial company would feel itself impelled to extend the blessings of the telephone service to village communities in similar circumstances.

New exchanges were provided in fifty-five different counties in 1927 including the Orkneys and Caithness in the extreme North and Pembroke, Cardigan, and Cornwall in the West. Few of the places thus added to the telephone system are known to fame,—more than half of them do not even possess a railway station. Ilchester and Great Bedwyn returned members to Parliament before they were swept away with the "rotten boroughs" by the Reform Bill of 1830. Holy Island was a bishop's see until the year 900, but the rest of the villages are little known outside their own locality, save some dozen which may be familiar by name to railway travellers. Wetwang, Sampford Peverell, Great Tew, Constantine, Aston Clinton, Hurstbourne Tarrant, Cottesmore, Bozeat, Stoke Mandeville, Middleton Cheney, Chislet, and Dent, have a thoroughly English ring, but most of us would be hard put to it to find all of them on the map.

Wiltshire claims the greatest number of new exchanges with 8 (Great Bedwyn, Chirton, Wanborough, Chute Standen, Stapleford, Winterbourne Gunner, Handley, Landford); Norfolk comes next with 6; Aberdeenshire, County Down, Devon, Hampshire, Kent, Salop, and Suffolk have 5 each; Cornwall and Yorkshire, 4 each. Caithness, Banff, Dumfries, Northumberland, Durham, Lincolnshire, Staffordshire, Monmouth, Pembroke, and Somerset have 3 each. Thirteen counties lying between Ross-shire and Dorset have 2 each.

These towns, of course, obtain not only local service but are connected with the Post Office system by junction lines of a quality which ensure that the subscribers really do enjoy full communication with the great world. An eloquent testimony of this was the Christmas greeting which was recently passed over the transatlantic telephone from the village of Twigworth in Gloucestershire to San Francisco on the distant Pacific Coast.

HIC ET UBIQUE.

THE actual number of telephones working in Great Britain and Northern Ireland at Dec. 31 last was 1,633,802, made up as follows:—

Post Office System	1,598,174
Maintained by P.O.	13,062
Hull Corporation System	15,422
Guernsey States System	4,053
Jersey States System	3,091
	1,633,802

The award of the Legion of Honour to a woman telephone operator in the employ of the Paris telephone service has been decided upon by the French Government.

The recipient, Mme. Baudesson, is at present a supervisor in the Littre exchange. She has been officially advised that the award is for "devoted service."

Mme. Baudesson has been a telephone operator at various exchanges in Paris since the age of 20. She is declared to have a remarkable technical knowledge of the telephone system.

As from Jan. 26 the telephone service to Canada, hitherto restricted to calls between subscribers in London on the one hand, and subscribers in Ottawa, Quebec, Montreal, Toronto, and Hamilton

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Old Mantlest (who has been receiving instructions in the use of the new automatic telephone): "And you expect me to fiddle about with my little finger and select the right number? What the devil d'you take me for—the educated pig at the circus?"

[*Reproduced by the courtesy of "London Opinion."*

(Ontario) in Canada on the other hand, has been available to subscribers in all parts of Great Britain. In Canada, communication is still limited to the above-mentioned towns.

Statistics from Esthonia for the year ended Mar. 31, 1927, show that the total number of telegrams handled during the previous 12 months was 351,000. The total number of telephone messages exchanged was 13,245,853. The total number of telephones was 11,723, of which 9,705 were apparatus belonging to the State, 926 belonging to subscribers, and 1,092 supplementary apparatus.

A commencement with the extension of the Transatlantic Telephone Service to the continent of Europe was made on Jan. 19, when the service was opened between the whole of the United States and Cuba on the one hand, and Brussels and Antwerp on the other hand. Extensions of this service to other European countries are planned to take place shortly.

The bulk of the telephone service of the City of Cologne; says Reuter, was changed over to the automatic system during the night of Dec. 10. The operation took several hours, and for that period the telephones could not be used, much dislocation resulting in consequence. The initial numbers of the previous system have been retained, giving the five integers which are necessary for the working of the automatic system.

The Department of Overseas Trade has published through the Stationery Office (4*s.* 6*d.* net) a composite report by British Consular officials upon conditions in various North African countries. The Algerian report states that the telephone service between Algiers and Tunis is in admirable working order. There are similar communications between Algiers and Oran, and it is hoped that the service between Oran and Rabat will shortly be completed, thus placing the whole of the North African coast line in direct telephonic communication.

A recent note in the Press stated that the Paris-Stockholm circuit (2,362 Km.) was the longest "through" trunk line in Europe. By "through" line is meant a trunk line connecting two towns without intermediate switching. The London-Stockholm circuit is, however, still longer, being 2,456 Km. in length. The London-Berlin line is 1,393 Km. long.

TELEGRAPH AND TELEPHONE FINANCE.*

BY SIR HENRY N. BUNBURY, K.C.B.

(*Continued from p.* 87.)

IF we look at the subject from another angle, we shall find the same process at work. Let us take the average prime cost, per station, of telephone plant, excluding land and buildings which in the Commercial Accounts are dealt with in a separate account. On Mar. 31, 1923, the average prime cost of plant per station was £55. In the succeeding years it has risen as follows :—

	£	*s.*	*d.*
Mar. 31, 1924	56	8	0
„ 1925	58	18	0
„ 1926	61	16	0
„ 1927	64	0	0 (approx.)

So that since 1923 the average cost of all plant, new and old, installed has grown by over 16%. The problem for the management is, will this growth be arrested or, alternatively, will there be a counter-balancing increase of revenue per station or decrease in operating expenses per station before we reach the point at which an increase in telephone rates becomes inevitable ?

I will now turn to another subject which has, at the present time, a very real and live interest, and that is the earning capacity of the Trunk system under the present tariff. Now there seems to be little doubt that Trunk business as a whole is remunerative, and certainly the more heavily loaded Trunk routes are very remunerative. But here, again, a tendency may be observed which is a little disquieting. In 1922-23 the average revenue from an Inland Trunk Call was 13.36*d.* In the succeeding years the corresponding figures have been as follows :—

	d.
1923-24	12.26
1924-25	11.25
1925-26	10.81
1926-27	10.64

and in 1927-28 the decline has still continued.

These figures include the local fee, and it must be borne in mind that not only was the local fee reduced to a 1*d.* in 1924, but there were some small reductions in short distance Trunk charges in July, 1923, and some larger reductions in July, 1924. But even after allowing for this it seems clear that the short distance Trunk traffic is growing more rapidly than the longer distance traffic, if, indeed, the latter is growing at all, as to which I have not any recent information. The same tendency has been observed in Germany and in the U.S. It suggests that we may have here a problem in the business economics of telephones which may become important. It is significant that the American Telegraph and Telephone Company, in October, 1926, reduced their longer distance charges and, we understand, are about to make a further reduction in those charges.

In order not to leave you with an unbalanced view of the financial position of the telephone service, let me conclude by saying that, in other respects, the last five years have shown a very satisfactory improvement. Operating costs and maintenance, in proportion to revenue, are steadily declining, and there has been a remarkable improvement in the collection of the revenue for which the greatest credit is due to the District Managers and their staffs. The outstandings at the end of a quarter have fallen to an extremely small proportion and the bad debts have become relatively insignificant. It must, however, be added that plant charges, as has already been said, form so large a proportion of the cost of telephone service that economies in operation and maintenance, valuable as they are, can do little in the way of redressing the balance. The figures are as follows :—

III.—*Telephone Service.*

	Percentage of Revenue.				
	1922-23. %	1923-24. %	1924-25. %	1925-26. %	1926-27. %
Administration, Operating, &c.	33.5	30.9	32.0	30.9	30.4
Maintenance	17.6	15.6	16.0	15.8	15.4
Accommodation ...	4.8	4.9	5.2	5.3	5.4
Miscellaneous (Travelling, Stationery, Printing, &c.) ...	1.5	1.7	1.9	2.0	1.9
Fixed Plant charges (Depreciation and interest)	33.7	35.2	39.2	42.6	45.3

* Paper read before the Post Office Telephone and Telegraph Society of London.

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We will now turn to the Telegraph service, and it will be convenient to begin with the Inland service and then go on to look at the Telegraph service as a whole, for it must be remembered that the Inland and Foreign services are essentially what economists call "joint products," each leaning on and supporting the other.

The figures of the Inland Telegraph service for the quinquennium which we are studying are as follows:—

IV.—*Inland Telegraph Service.*

(Including Anglo-I.F.S.; Press Inland and Railway Pass.)

Average Cost of Living Index.	Year.	Expenditure.	Income.	Deficit.
93	1922-3	£5,461,000	£3,926,000	£1,535,000
77½	1923-4	4,992,000	3,625,000	1,367,000
77½	1924-5	4,939,000	3,444,000	1,495,000
77½	1925-6	4,862,000	3,290,000	1,572,000
75	1926-7	4,696,000	3,125,000	1,571,000

["Sutton" payments and wireless licence profits excluded.]

As you will agree, there is little comfort to be derived from them. The only factor that seems able to arrest in any degree the growth of the Inland Telegraph deficit is a fall in the cost of living; and while I personally expect some further fall to take place, it is not to be expected that it will be either considerable or rapid. A fall of 5 points in the average cost of living figure means, on the present staff, a reduction of about £113,000 in the cost of operation.

Replacement of pre-war by post-war plant is going on in the Telegraph service, but not only are the plant charges in themselves a relatively small factor of cost but the replacement is going on at a very much slower rate and I would hazard the opinion that it is being done at relatively lower prices.

We have so often discussed in this Hall one aspect or another of the problems of the Inland Telegraph service, that I will spare you any further disquisition on the subject this evening and content myself with giving you the figures, which show that things are not getting any better.

We come now to the Telegraph Services as a whole, which comprises, in addition to the Inland Service, the Anglo-Continental Services, the Imperial Cable, and the Point-to-Point and Ship-and-Shore Wireless Services. In the figures which I am going to give you the surplus of receipts from Wireless Receiving Licences, after paying the expenses of management and the share due to the B.B.C., have been excluded. Whatever that surplus may be, it should not be regarded as an element in the Telegraph Services operated by the Post Office. The figures for our five-year period are as follows:—

V.—*Telegraph Service—Inland and Foreign.*

Average Cost of living Index	1922-23. 93	1923-24. 77½	1924-25. 77½	1925-26. 77½	1926-27. 75
	£	£	£	£	£
Expenditure ...	6,942,000	6,424,000	6,463,000	6,461,000	6,401,000
Revenue* ...	5,510,000	5,209,000	5,099,000	4,998,000	4,921,000
Deficit ...	1,432,000	1,215,000	1,364,000	1,463,000	1,480,000

["Sutton" payments and profit on wireless receiving licences excluded.]

You will observe that whereas in 1922-23 the revenue from the Inland Service represented 71% of the total revenue, in 1926-27 it represented only 63%. In subsequent years, with the full revenue from the Beam Services, the Inland Telegraph revenue will form a still smaller proportion of the total.

You will also observe that throughout the period the Foreign Services as a whole have shown a profit; for the deficit on the whole service has been less than the deficit on the Inland Services taken by themselves. That profit keeps fairly steady at from £100,000 to £150,000 a year.

When, however, we ask where it comes from we find that there is, or at any rate has been until this year, only one golden egg in the nest, and that is laid by the Anglo-Continental Cable Services. And, unfortunately, for the three middle years of our quinquennium the revenue from these services was falling, the expenditure increasing and the surplus shrinking. Omitting the first year, 1922-23, when the cost of living figure stood at 93, the surplus on the Anglo-Continental Services has been as follows:—

1923-24	£223,000
1924-25	£179,000
1925-26	£166,000
1926-27	£212,265

Now while telephone competition is perhaps unlikely to have the same effect on the Continental services as it has had and will have on the Inland, it is a factor that cannot be ignored. We have, moreover, to bear in mind the loss of traffic that must result to our cable system from our own and the Marconi Company's Radio services to the Continent. We should be wise, therefore, to assume that the revenue and traffic of the Continental Telegraph Services, though we may perhaps hope for an arrest of the recent decline, will not show any marked tendency to increase. In the last year of the period the traffic was steady, the revenue rose, and the expenses fell, owing to the decline in bonus. There is therefore some reason to hope that an improvement has set in, but one year, and that a somewhat abnormal year, is not much to go on. It is to be hoped, however, that this year marks the end of the growth in the working expenses of these services.

As regards the Imperial Cable we can scarcely hope for any improvement; indeed, Beam competition may make things very much worse than they were in 1926-27. The Wireless Services as a whole, with the aid of the prosperous Beam Services, may be expected steadily to improve their financial position, and perhaps it is in that direction that our chief hopes must lie. At any rate they are new services still in the stage of formation and development when increasing efficiency can be attained as experience grows and the volume of traffic develops. They have all the advantages of youth.

It is always useful to see what other people similarly situated to ourselves are doing, so let us conclude in this manner.

As we have seen, in those countries which are already highly developed telephonically, there are signs of difficulties to come. They are being produced by two causes (*a*) the replacement of pre-war by post-war plant, (*b*) the tendency of the cost of the unit of telephone service to increase as the complexity of the system increases—a tendency which is well recognised by telephone experts. In countries, on the other hand, which are backward telephonically, it seems likely that progress will be steady and will not be hampered by financial difficulties other than those which impoverished Governments find in raising capital for any purpose. For this and other reasons there has been a marked tendency in foreign countries, where public utility services are administered by the State, to divorce the finance of those services from the national budget and to give them financial autonomy including borrowing powers. So long as Governments are in financial difficulties it is to be expected that this tendency will continue. The Italians have gone even further and have handed over their telephone services entirely to private enterprise.

As regards Telegraphs, nearly every country is in difficulties, and I am inclined to think that we are at the beginning of a period in which attempts will be made in many countries and in many ways to find a solution of the great problem, how to provide a self-supporting telegraph service in a telephonically developed country. Some attempts have already begun: notably in Germany. We are, I think, telegraphically speaking, at the end of one epoch, and I should like to suggest to your Committee that the next general paper which they invite on the Telegraph service should be one entitled "The Telegraph Service in 1950."

It should not be assumed that telegraphy is going to disappear. In this country the average distance of a telephone trunk call is about 40 miles, and the average distance of an inland telegram over 145 miles. That is a very significant fact. Telegraphy is, and seems likely to remain, the cheapest means of rapid communication over long distances. For this reason alone—and there are others—we are not in the least called upon to regard telegraphy as played out. What is necessary is that if the users of the Telegraph service ought to pay what it costs to render that service—and there seems to be no obvious reason why anybody else should pay it for them—it is incumbent on us to render the service with the highest possible efficiency and the lowest possible cost. And in considering whether the present level of efficiency can be increased and the present level of cost reduced there may still be something to be learnt from the resources of science and from modern ideas and methods of organisation.

It is therefore of some interest to see whether there are analogies in other branches of industrial production and service. And we have not very far to look. The problem of motor omnibus competition with electric tramways, and that of road transport competition with railways is almost a precise analogy. I think that the problem presented to the gramophone industry when Broadcasting emerged on the horizon was not very different. And similarly the competition of electricity with gas as a source of light, heat and power. I will not weary you with further examples for you can easily find them for yourselves. But I should like in conclusion to point out that in all these cases there is no suggestion that the older form of service can be entirely superseded by the newer. Even in the case of the London Tramways the authorities agree that trains and buses alone could not possibly cope with the peak traffic of London and that there can be no question of abandoning the tramways. On the other hand the tramways by themselves do not pay, and where free omnibus competition is allowed could probably not be made to pay except perhaps where exceptional and necessarily temporary advantages exist in the way of low capitalisation on a pre-war basis. Accordingly we find in such cases a general process going on—the attempt to reach the highest standard of technical operating and managerial efficiency, and to establish, where possible, co-operative rather than competitive working, in order to secure the concentration of each service on those functions which it can best perform

For such purposes we in this country are in a favourable position, with our telegraph and telephone services vested in a single authority and operated under a common control. We are not faced, at the outset of our efforts, with the desperate problem of bringing rival vested interests into a common management and the co-operative habit. And in presenting to you the salient, and as it were, the dominating financial figures of the past 5 years, I have done so under the conviction that we as a great public utility service shall not, and indeed cannot stand still, and that the figures may be of some help as a primary indication of what our problems are going to be.

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PRESS TELEGRAM WORK.*

BY J. NEWLANDS, C.B.E, C.I.E.

(*Continued from p.* 91.)

IT has occurred to me that possibly my audience here to-night would appreciate it if I gave them one brief glance into the actual conditions which existed under by far the largest of the Telegraph Companies. For this purpose I must quote a few sentences from a letter received some years ago from my old friend Mr. Andrew Gray, late Controller, Telegraph Department, Edinburgh. A few weeks ago I called upon him near Edinburgh and had a delightful chat on "Telegraphs." He is now in his 93rd year and must, I should think, be the "Father" of the Telegraph Service. He wrote to me as follows :—

> "I wonder what my old colleagues of the early pioneer days, with our sand and sulphuric acid batteries and imperfect insulatio n which would not carry our signals more than 200 miles, would think of it all could they "revisit the glimpses of the moon"? You say, truly enough, that "many important towns had no direct communication with London," and the reason is obvious. When I joined the Premier Company in 1853—six years after it commenced business—we had only Daniell's batteries and insulation that was put out of gear by a shower of rain. So that at that time *all* the traffic—down and up—had to be re-transmitted at York. The North circuit was an omnibus one for Newcastle, Edinburgh and Glasgow. Each of these places had it for 20 minutes every hour—ten minutes sending, ten minutes receiving—Hull, Leeds, Liverpool and Manchester had their own wires to York. You can readily imagine under these circumstances we were not greatly concerned about a little delay! This, of course, did not last very long. Liverpool and Manchester got through, and Glasgow then sent most of his work via the former town."

This quotation will enable you to judge how great has been the progress of the Postal Telegraph System since 1870, how enormously the means of communication have been multiplied, and it should, at the same time, reflect the highest possible credit upon the Engineering Department and all its officers for the truly wonderful manner in which they have been able to cope with every expansion of the business and with all the emergencies which have arisen from time to time during the chequered history of the State Telegraphs.

The ground is now prepared for the consideration of those parts of "The Telegraph Act, 1868," which bear upon the subject of my address to-night, viz., "Press Telegram Work." Let us inquire what were the salient points contained in the Act on this matter. There were two notable alterations. Firstly, the revised arrangements and reduced tariff for newspaper "Special" or "Private" wires, and secondly, the adoption of a uniform tariff for Press messages sent over the public wires.

As regards the first, "Special wires" were provided by the Telegraph Companies to a relatively small number of newspapers in Edinburgh, Glasgow and Dublin for *eight hours* in the night at an annual charge of £750. This included the cost of providing the staff to work the wires at both ends of each circuit. Slip and other essentials were thrown in as "extras" under the inclusive price mentioned.

They had arranged for cheaper rates as under :—

Wires under 100 miles	...	...	...	£600 a year.
„ „ 200 „	...	...	...	£675 „

No such shorter wires were in use.

Under the Postal Telegraph revised plan they stepped boldly in and offered "Special Wires" to any newspaper for *twelve hours* nightly (6 p.m. to 6 a.m., afterwards altered to 4 p.m. to 4 a.m.—if required) for £500, an all-inclusive charge covering, as before, staff, slip, &c., and irrespective altogether of distance. This gave an important extension of time and a greatly reduced charge. It seems highly probable that this low charge never proved remunerative to the Department for the services rendered. In any case it was estimated in the year 1912 that the loss on "Special Wires" was approximately £12,000, and, as a consequence, a new tariff for such wires was introduced soon after. In addition to this the staff on each "Special Wire" is now employed and paid by the newspapers and not by the Department. At the present date there are 30 "Special Wires" in use between London and provincial newspaper offices. All except two are "morning" papers, the two being Manchester *Evening News* and Leeds *Evening News*.

The value of a "Special Wire" to a busy "morning" newspaper will be best understood when I inform you that in September, 1870, six papers signalled each on an average 8,556 words per night, and, reckoning on six days per week for 52 weeks, this large total, if taken at 1*s.* for each 100 words, represents £1,341 12*s.* per annum.

Passing on to the second notable alteration made by the Act, what do we find? Instead of the former Companies' plan of charging for Press messages at 30 words "day" rate or 40 words "night" rate, according to distance, 1*s.* up to 100 miles, 1*s.* 6*d.* up to 200 miles, 2*s.* above 200 miles and from 3*s.* to 6*s.* between Great Britain and Ireland, with a 25% "copy" rate *within the same town*, the Act introduced and imposed a uniform rate of 75 words "day" rate and 100 words "night" rate for 1*s.*, "with an additional charge of 2*d.* for every 100 words or 2*d.* for every 75 words, as the case may be, of the same telegraphic communication so transmitted to every additional address," wherever situated. In other words, the "copy" rate was henceforward to be nation-wide all over the United Kingdom, while at the same time extended hours were introduced for "night" Press rates. In order to realise the difference or full significance of this revised system of charging, let us see what the respective charges had been and were henceforth to be for one column of news matter of, say, 2,000 words. Mr. Disraeli had been delivering an important political speech in Edinburgh in 1868, and reference had been made to the telegraphing of that particular speech when witnesses were being examined. We may ignore the method of charging according to distance altogether and assume an average initial rate for the first address of 40 words at 1*s.* 6*d.*, and 25% for one "copy" for a second address in the same town. Therefore, 2,000 words at 1*s.* 6*d.* for every 40 words would cost for the first address 75*s.*, while the cost at the "copy" rate for the second address would be one quarter more, or 18*s.* 9*d.*, making a total of £4 13*s.* 9*d.* These were the Companies' charges.

On the other hand, the Postal Telegraph charge for 2,000 words at 1*s.* per 100 would be 20*s.* for the first address and twenty times 2*d.* for the "copy" to the second address, or 3*s.* 4*d.*, making a total of 23*s.* 4*d.*, as against £4 13*s.* 9*d.*—a dead loss of three-fourths.

Take a further illustration, on a wider scale and, as we all know, a much more likely one to happen. Assume that when Mr. Gladstone was delivering in Edinburgh one of his celebrated Midlothian speeches, and that 20 separate towns in the United Kingdom were taking a column report of 2,000 words. Assume also that in each of these 20 towns there was a secondary address or newspaper taking this particular column at the "copy" rate, thus making 40 addresses in all. The total cost of such an important Press message under the Telegraph Companies' exorbitant rates would have been, for the 20 initial addresses, as under :—

	£	*s.*	*d.*
20 times 75*s.*	75	0	0
20 times 18*s.* 9*d.*	18	15	0
Revenue ...	£93	15	0

This figure works out at £2 6*s.* 10½*d.* per newspaper address. Under the Postal Telegraph System this message would only cost :—

	£	*s.*	*d.*
For first address	1	0	0
For 39 copies at 3*s.* 4*d.*	6	0	0
Revenue ...	£7	0	0

A difference of £86 15*s.* on this single transaction. In this instance, as 40 separate newspapers would have been provided with an excellent summary of the latest and most up-to-date speech, good, readable news for their readers, then, as the total charge amounted only to the sum of £7, it is evident that the revenue received was only 3*s.* 6*d.* per newspaper address. As usual, this exceedingly small charge would not have included the cost of delivery. This works out at 2½*d.* per 100 words. Clearly, very cheap reading for the great British public and very profitable for the newspapers.

It is essential that I should bring it clearly within your comprehension that while the Telegraph Companies' "contract" scheme provided a really cheap service at 4*d.* per 100 words, it was only given to those who contracted for a full year. Anybody outside that contract, and indeed even those inside it, had to pay a most appalling price for any additional news not included within the scope of the scheduled "expresses."

I have so far only referred to Press messages of the length of one column, but, of course, many important political pronouncements subsequent to 1870 ran up to four columns in length, that is, 8,000 words, or thereabouts. Therefore the Telegraph Companies' charge for a message of such inordinate length would have been £15 for the first address and £3 15*s.* for one extra copy in the same town, while the Postal Telegraphs had undertaken to deal with such a message from, say, Glasgow to London, for 80*s.* for the first address and 80 twopences, or 13*s.* 4*d.*, for one extra "copy," which might have to be transmitted and delivered in Plymouth or in Cork, or anywhere else in the United Kingdom. We have thus :—

	£	*s.*	*d.*
Companies' charge	18	15	0
Postal Telegraphs' charge	4	13	4
Difference ...	£14	1	8

Therefore, these two supposed newspapers would receive four columns of good readable news matter carefully transmitted and retransmitted over the Postal Telegraph system, at almost exactly one-quarter of the cost which would have been chargeable under the Telegraph Companies' tariff.

* Paper read to the Post Office Telephone and Telegraph Society of London. *

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Recollect that in addition the actual cost of delivering an 8,000 words speech, even in batches in two separate towns, represented a very considerable extra sum.

There was in existence, however, an alternative, or extra, tariff to cover the transmission of important "Specials" from the provinces to London newspapers only, if and when required. Each paper was then charged three guineas for an 1,800 word report or summary, and this extra ordinary tariff worked out at 3*s*. 6*d*. per 100 words. There was no "copy" rate for such Press messages.

It is desirable to prove and establish the fact that the charges made by the Telegraph Companies for all "special" reports and indeed for every kind of Press telegram which did not fall within the scope of the 4,000 words contained in their daily "expresses" were so high as to be practically prohibitive. The newspapers could not afford to pay the price. Such "specials" were a genuine luxury. Obviously there were then, as there have been ever since, hundreds of important events, the movements and doings of Royalty, political and election speeches, agricultural shows, mining, railway and shipping disasters, accidents, murders, trials, &c., occurring in the provinces concerning which a well-organised newspaper would have been glad to publish suitable reports. News is not all confined to the London area. It is not all gathered, manufactured and written up in Fleet Street, but this great mass of general news throughout the provinces had to be left unreported and unpublished except in purely local papers, because the cost of telegraphing it from place to place was prohibitive to all except the most prosperous newspapers. Can this statement be substantiated? Page 98, Minutes of Evidence taken before Select Committee on the Electric Telegraphs Bill. Questioner, the Chairman, Chancellor of the Exchequer examining Mr. William Saunders, Managing Proprietor of the *Western Morning News*, Plymouth, who was one of the newspaper representatives. "Question 1370. Apart from the news which is supplied to you by the agency of the Intelligence Department of the Telegraph Companies, do you occasionally have special messages?—Yes, we get them; but rarely, for the rates for their transmission are too high."

"Question 1371. So that if you want to go outside the exact scheme of news provided by the Telegraph Companies, you have to pay a very high rate?—Yes."

"Q. 1372. Is that practically found to be almost prohibitive?—Almost prohibitive; I find that 13 daily newspapers and 11 weekly newspapers during the last two months have received only about £48 worth of those telegrams; 24 papers in two months have spent only £48 on those telegrams for news from London." An average of £1 per month for each newspaper, or about 9*d*. per day.

"Q. 1373. Do you think that under the reduced rates proposed by the Post Office you will frequently have recourse to special messages?—I am afraid we shall spend a great deal more then."

Can you wonder that it soon became obvious something had gone wrong with the telegraph revenues? Or are you surprised to learn that by March 1875—only five years after the transfer—the Treasury felt impelled to appoint a special Committee to inquire into the financial state of the Telegraph Service. One of the members of that Committee was, fortunately, Mr. Henry Weaver, whom I have already referred to as having been the Secretary of the Electric and International Telegraph Company. He had expert knowledge and could compare the old and the new Press tariff.

This committee reported as the result of their investigation that the Press tariff was "essentially unsound." Thereupon the Postmaster-General made a strong attempt to get rid of the disastrous 2*d*. "copy" rate throughout the U.K.

On Dec. 23, 1875, he proposed to the Treasury "that the reduced charge of 2*d*. should be confined to copies distributed by hand, and that all messages which are telegraphed should be charged the full Press rates." Had this proposal been agreed to it was estimated that a gain of at least £30,000 per annum would have been secured, but the die had been firmly cast and it was found impracticable to reverse or revise the charges for Press telegrams which had been debated, agreed upon and finally incorporated in an Act of Parliament. It was too late to apply a remedy. Furthermore, the proposal was strongly, even bitterly opposed by the newspaper owners, many of whom, accompanied by 36 Members of Parliament, forming a most formidable deputation, met the Postmaster-General and discussed with him his proposal to effect an upward change in the tariff. They protested in vigorous terms against any change in the "copy" rate.

The leading speaker, Mr. Norwood, M.P., stressed the following point, viz.: "We regard the Press as an important educational machine and engine for the diffusion of knowledge, and we consider that the ample telegraphic reports which the provincial Press give their readers on matters of public interest are of importance in the tendency they must inevitably have, of advancing the intelligence of the masses." There is truth in the argument, but it did not bring grist to the telegraph mill.

When Mr. Herbert Samuel was Postmaster-General in 1911 he made a similar proposal to a strong deputation of the Press that the 2*d*. "copy" rate should be revised, but it met with the most uncompromising hostility. They would have none of it.

It was discovered about the same time in 1875 that the Postal Telegraph Department had somehow fallen into an erroneous method of "continuous counting," under which many separately transmitted messages had been charged as *one*, when, in reality, they consisted of many separate messages or batches of news sent by the Press Association or Central News under one or other of their numerous distinctive services. As a consequence a considerable loss had been going on since 1870. Mr. W. Saunders, of the "Central News," pointed out at the above-mentioned deputation the following curious fact: "By the Post Office Account for Feb. 11, 1876, I find that I sent a message on that day to 265 addresses, which is charged in your account £2 5*s*." This works out at 2*d*. per address, and, as these 265 separate messages would be distributed over England, Scotland, Ireland and Wales, involving numerous transmissions and retransmissions before they all reached their final destinations, it is perfectly obvious that this kind of work involved the Department in a palpable and dead loss. Recollect that in this instance once again the Postal Telegraph Service had to pay for the cost of delivering these 265 news items. At 1*d*. per message this would absorb £1 2*s*. out of the total revenue received of £2 5*s*.

Verily the balance of £1 3*s*. remaining would not leave much in hand to pay the poor telegraphists' wages, maintain the apparatus, wires, poles and buildings.

A separate Committee unearthed another similar case and they reported that: "To such an extent is this the case that one instance was adduced in evidence in which the Post Office was called on to deliver 1,640 messages for the sum of £1 15*s*. 2*d*., or one farthing each." The only possible comment I can make on this miserable result is that the Department may have paid out £6 16*s*. 6*d*. (at 1*d*. per message) in order to deliver this service, for which only 35*s*. 2*d*. had been paid by the sender.

This very peculiar method of "continuous counting" was *not* traceable to the Act of Parliament. It was probably introduced owing to some faulty construction being put upon the wording of the Act. It may have arisen either in the new postal "Intelligence Department," owing to improper counting, or it may have been due to some failure in the accounting system as applied to the services of the News Associations. In any case this palpable defect and loss of revenue was not in any way due to the Telegraph Staff. They carried out the transmission work all right, but it profited them not at all.

On looking backward over the past 57 years or more I am strongly inclined to the belief that the Post Office would have acted wisely if, on taking over the telegraphs they had scrapped the "Intelligence Department" altogether, just as they scrapped or gave up entirely those other functions of the I.D., viz.: the collection and editing of the news supplies. As the years rolled by and as the volume of Press traffic increased beyond all reasonable anticipation it became evident that much if not most of the initial delay which hampered and prevented the prompt transmission of Press work from London was directly traceable to its preparatory treatment within the "Intelligence Department." For example, the Parliamentary reports for the "morning" newspapers which were handed in at 6 p.m. and bore the code "F" used only to begin to trickle through on the first Scotch news wire by about 6.40 p.m. This clearly indicated a belated start and it led to numerous complaints which gave rise to much discussion.

The treatment of news in London is, properly considered, a national matter rather than a C.T.O. one. The whole process of dealing with both inward and outward news was remodelled towards the end of 1911 with the most gratifying results both to the Department and to the Press. Each of the News Agencies made due recognition of the improvement then effected. On Mar. 27, 1912, the staff engaged on news work within the Special Section, the Intelligence Department and the News Division numbered 356. Of these, 21 were Supervising Officers and 335 were full-time Telegraphists. I wonder what the figures are now, 15½ years later.

Let us consider other causes of the delay sustained by news messages when dealt with in the largest telegraph office in the world.

It was stated in June, 1913, that in the C.T.O. a large number of Press telegrams were received by tube and the tubing operation from the more distant offices often occupied over a quarter of an hour. These messages, received in the Central Hall on the ground floor, have to be re-tubed to the several floors of the C.T.O., which for telegraphic purposes is a most inconvenient building. From distributing points on the several floors the messages have to be taken by hand or carrier to the section containing the outgoing circuit and then again to the circuit itself. These processes take time, as there is a sortation at every point.

It is a most difficult matter to look forward 20, 30, 40, 50 years and estimate what will be the full effect of an apparently small omission. On the other hand, it is a comparatively simple matter to look backwards over a similar period of years and observe what a disastrous loss has occurred because some apparently slight concession has been, almost unwittingly, agreed to and inserted in an Act of Parliament, or, alternatively, that some little safeguarding clause has been omitted therefrom.

Those of us who have been intimately connected with the Telegraph Department know how depressing it has been to be constantly reminded that there is a heavy loss on telegraphs. In one of the Post Office publications issued in 1911 it is stated: "At no time has the revenue from the telegraph service been sufficient to pay the interest on the capital; and for the last 20 years the service has been carried on at a considerable loss. In the first place it is now believed that the terms of purchase were unduly favourable to the Companies, and the revenue has throughout been detrimentally affected by the low tariff granted to the Press under the Act of 1868, entailing an annual loss of about £225,000; and by the privilege of sending free messages conferred on railway companies by the same Act. Even under the commutation arrangement referred to above about a million and a quarter such telegrams are sent yearly—a loss of about £50,000."

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I want you to observe how astute the railway managers must have been in 1868 in securing this vast and comprehensive privilege. Their use of the privilege grew year by year until it became a scandal and had to be commuted at excessive cost to the taxpayer.

It should never be lost sight of that if any private Telegraph Company had found that they were losing heavily year by year owing to their Tariff having been framed on too generous terms their first endeavours would have been to revise their charges, and, most assuredly, their wages bill for their operators would not have been allowed to go up and up as they have necessarily done under State control. There would have been no Parliamentary or other Committees to keep on adding to the cost of working their undertaking. Some people may be inclined to overlook this palpable fact.

In my judgment the worst feature of these recurrent Committees has not been that they increased the wages bill—that was inevitable—but rather that their cumulative recommendations have unquestionably imposed on the Department an enormous overload of absolutely unremunerative writing and checking labour in order to carry out their decisions. This is a most important point and one which ought to be remembered in future.

At this stage it may be well to interpolate that after the war the Press rates were altered, on Jan. 1, 1920, to 60 words "day" and 80 words "night" for 1*s*., with a copy rate of 3*d*., instead of 75 words "day" and 100 words "night" for 1*s*., and a "copy" rate of 2*d*.

Undoubtedly this may do some good, but, from the Post Office point of view, the "copy" rate is still *much too low* to make the business a paying proposition.

You may possibly recollect that the *Daily Mail* had a leading article headed, "Subsidised Newspapers. Press Telegrams below Cost." It proceeded to say, "When is the Government going to act? The charge for inland Press telegrams ought to cover all the cost of the service and should provide a reasonable commercial profit as well."

The *Daily Mail*, therefore, protests against the present method of undercharging for telegrams which are sent to the Press. Bravo! Admirable! I agree with every word quoted, but when I read the article I had a sort of lurking suspicion that behind the heroic call for economy there might possibly lie a subtle suggestion on the part of the wealthy newspapers that by increasing the costs all round it would result in the "Slaughter of the Innocents," that is, the total extinction of the poorer class of newspapers, thus at one fell swoop clearing off from the newspaper field much of the existing healthy and local competition which exists to-day in all directions.

However, we must now return to the text for this evening's discourse.

The immense increase in Press telegraphy which took place immediately on the acquisition of the telegraphs by the State is evidence enough that the Press rates must have been greatly lowered. The 4,000 words of the Telegraph Companies' days would be about two-and-a-quarter columns; in January, 1871—a year after the transfer—Mr. Scudamore wrote: "I have seen as many as twelve columns of telegraphic news in leading provincial journals." Query. What would he have found in 1927?

The most convincing method of indicating how immediately and how rapidly "Press Telegram Work" increased in volume under the Postal Telegraph System is shown by the yearly revenue, which leaped up and expanded at a great rate.

Detailed figures will be shown on the lantern screen. There are subjoined, also, some recent statistics showing the number of words in Press messages yearly for the past six years.

The £31,975 of 1870-71 had more than doubled by 1876-7. The revenue had trebled by 1882-3; it had quadrupled by 1896-7; and it reached its maximum of £148,394 in 1911-12. Unquestionably this clearly proves a growing appreciation by the newspaper press of the utility of the news services.

PRESS TELEGRAM REVENUE.

Year.	Revenue. £	Year.	Revenue. £	Year.	Revenue £
1870-1 ...	31,975	1889-90 ...	111,297	1908-9 ...	140,061
1871-2 ...	39,175	1890-1 ...	113,149	1909-10 ...	145,339
1872-3 ...	43,300	1891-2 ...	116,247	1910-11 ...	144,934
1873-4 ...	52,688	1892-3 ...	120,299	1911-12 ...	148,394
1874-5 ...	58,478	1893-4 ...	125,770	1912-13 ...	147,900
1875-6 ...	58,165	1894-5 ...	119,061	1913-14 ...	140,619
1876-7 ...	65,041	1895-6 ...	124,881	1914-15 ...	129,682
1877-8 ...	64,367	1896-7 ...	128,823	1915-16 ...	98,950
1878-9 ...	71,813	1897-8 ...	133,009	1916-17 ...	81,144
1879-80 ...	76,269	1898-9 ...	134,231	1917-18 ...	71,769
1880-1 ...	85,031	1899-1900	143,233	1918-19 ...	72,916
1881-2 ...	87,233	1900-1 ...	141,600	1919-20 ...	105,831
1882-3 ...	97,989	1901-2 ...	136,780	1920-21 ...	134,093
1883-4 ...	99,825	1902-3 ...	143,740	1921-22 ...	130,810
1884-5 ...	98,637	1903-4 ...	141,496	1922-23 ...	109,559
1885-6 ...	103,415	1904-5 ...	146,268	1923-24 ...	91,175
1886-7 ...	111,150	1905-6 ...	145,005	1924-25 ...	83,314
1887-8 ...	111,570	1906-7 ...	137,237	1925-26 ...	83,940
1888-9 ...	111,159	1907-8 ...	140,008	1926-27 ...	82,140

Notes.—Up to, and including, 1886-7 the figures are for "News Produce and Special Wire Rentals"; after that year they show the revenue from Press telegrams only.

From 1922-23, amounts collected for Press telegrams originating in the Irish Free State are not included.

On Jan. 1, 1920, the rate was altered from 1*s*. for 100 words (night) or 75 words (day), with a copy rate of 2d., to 1*s*. for 80 words (night) or 60 words (day), with a copy rate of 3*d*.

TOTAL NUMBER OF WORDS CONTAINED IN PRESS TELEGRAMS ORIGINATING IN GREAT BRITAIN AND NORTHERN IRELAND DURING THE YEARS OCTOBER, 1921, TO SEPTEMBER, 1927 (PARTLY ESTIMATED).

Year.	No. of Words.
October, 1921—September, 1922	81,063,076
October, 1922—September, 1923	74,680,759
October, 1923—September, 1924	70,227,915
October, 1924—September, 1925	70,519,270
October, 1925—September, 1926	67,916,617
October, 1926—September, 1927	68,294,366

(*To be continued.*)

TELEPHONE DEVELOPMENT ASSOCIATION.

AT the Annual General Meeting of this Association, on Jan. 17 last, the Chairman, Sir Alexander Roger, in a speech dealing with the activities of his Association and the telephone development achieved by the Post Office, said:—

I am sure you will agree with me that this is a record of progress on which the Post Office, and all other administrations concerned, deserve the warm congratulation of the business community.

The old-established telephone truth—that the existence of facilities and of efficient service stimulates the demand and creates the necessary volume of traffic and, therefore, of revenue to justify the capital outlay involved—is holding good. I notice that the latest available statistics reveal the fact that during the six months to the end of September last there was an increase of 17.6% in the number of calls made to the Continent, and of 11.4% in the number of calls received from the Continent, in comparison with same period of 1926. Trunk business in this country has also shown a substantial increase.

There can be no doubt that this steady extension of facilities promotes an increase in the revenue received from telephone calls and, at the same time, calls for and justifies the bringing into service of additional new plant.

* * * *

The year has also seen the opening of London's first automatic exchange at Holborn, on which point, though in another capacity, I feel I should take this opportunity of saying a word. Automatics in this country are not new; they are working, with complete success, in over 60 provincial towns up and down the country. The opening of the first automatic exchange in London simply means that the experimental period is over and that the gigantic engineering undertaking of the conversion to automatics of London's vast, complicated, multi-exchanged area—a job which will take 15 years or so to complete—has been definitely and quite successfully initiated.

Already the same result which has regularly followed the introduction of automatic working in other districts and in other countries—an increase in the number of calls put through the exchange—is reported in the Holborn telephone area, and I am confident that this welcome phenomenon will be intensified as the work of conversion proceeds. . . .

It has become almost a tradition in this country to talk about the comparative operating efficiency of other countries' telephone systems to the disparagement of our own, but, in this case, you can in all moderation claim it as a tribute to British enterprise that the first installation in connexion with the conversion of the London telephone system to automatics has almost instantaneously attained such satisfactory results.

* * * *

My view is that telephone growth has only just started in this country, and that, so far from foreseeing any slowing down in the demand during the next few years, there will be a constant increase, especially if our hopes of more settled conditions, and, as a corollary, of increased national prosperity, are realised.

Nothing can stop telephone growth in this country. It is a snowball movement which gathers volume and momentum with the passage of time, but we must not leave our snowball to come to rest and slowly to thaw away to nothing. As we look back periodically over what has been done we get a better perpective of what still remains to be done, and, so far from being discouraged by the magnitude of our task, we get an incentive to tackle with renewed energy and determination the job of helping to make Great Britain a well-telephoned and a telephone-using nation.

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SECRET AND CONFIDENTIAL.

[This document was discovered by the office boy in the waste-paper basket of a minor official in a State-owned industry.]

THE ANNUAL REPORT OF THE PERIVALE ON THE PEAK TELEPHONE DISTRICT.

DURING the year 1927, the characteristic feature of the decrepit telephone system in the Perivale on the Peak Telephone District was that of continued increase typical of all years since the war. We believe that our annual contribution towards the reduction of taxation for business men has not decreased, for the total number of calls rose from 11,491,000 to 12,426,000, a net increase of 8.4%. Our total number of stations rose from 18,296 at the close of 1926 to 20,750 on Dec. 31 last, an increase of 13.7%. This result was doubtless due to Providence, for, judging from the general depression in privately-owned enterprises, the year 1927 contained no features conducive to improved trade—certainly not in a State-owned industry. Concurrently with this feature, the decline in the number of written complaints (from 5.2 to 4.1 per 100,000 calls) shows that the temper of the British Public is improving. This unexpected result possibly arises from the improved health of the community as a result of partaking of the patent medicines advertised in the Press by public-spirited newspaper proprietors.

The Department, fearing a comparison between its mediocre programme of plant re-organisation when compared with the vast extensions and improvements to be seen in progress on other systems of communication such as railways and canals, decided to replace three large exchanges by more modern types of equipment. Slushton-on-the-Ditch now boasts of a C.B.1 exchange. Diddleton Doddering delights in the perennial amusement of twiddling its dials, whether calls to the new automatic exchange are required or not. Indeed, so pleased was the community to have its ten-year old exchange brought up-to-date that the preselectors were all selected on the date of opening. A paragraph in the local press, however, made invidious comparisons between the automatic exchange and the new station recently erected by the North and South Railway, replete with centrally-heated waiting rooms, seats with radiator foot-warmers, automatic ticket machines, and driverless trains. The Department may some day, it is hoped, equal even the railways. It should be mentioned that a new exchange with continuous all-night service, has recently been opened at Ludnows Ware. Apparently in this sole feature the State-owned telephones have succeeded in establishing a record, for when railway stations and newspaper stalls were being distributed, Ludnows Ware was overlooked.

Towards the close of the year unusual climatic conditions prevailed. The week preceding Christmas had its usual heavy load augmented by a total stoppage of privately-owned road transport. Even motor mails suffered slightly. The reaction upon the decrepit telephone system was severe. In place of the usual no-delay service to London the traffic which amounted to 50% above any previous known record, caused an hour's delay on most routes. Strangely enough, the subscribers preferred to telephone their business rather than use the excellent train service. Immediately on the frost came a snowstorm of severity unequalled since 1881, or the Norman Conquest, whichever is the remotest. The actual number of trunk lines dislocated in this district was 27, out of a total of 497. It is understood that 200 were dislocated throughout the country, so that one or two must have been left standing somewhere. The proportion of subscribers' lines affected was somewhat less. It was observed that the roads and railways were not materially affected.

Far more damage was caused by the gale that followed. Owing to the negligence of the Department, it has never sought statutory powers to stay other people's trees, and, as a result, 31 trunk lines came down in this district alone. It is not known what steps the Postmaster-General proposes to take to claim damages from the owners of the trees, but being an un-commercial concern, no doubt this source of revenue will be overlooked as usual. In London alone, as a result of the floods, 2,000 subscribers' lines were flooded, and it is not known what happened to the other half-million.

The collapse of the telephone service, scandalous in itself, is overshadowed by one even more despicable. It is learnt on good authority that engineers and traffic officers have been heard uttering mutual congratulations over the events of the last few weeks. It is to be feared that this must be regarded as an ineradicable habit amidst the servants of a State-owned industry.

Curiously enough, it has been stated that the newspaper service broke down in one or two places where there *were* bookstalls, but this is doubtless an exaggeration.

Among the many novelties introduced by the Engineering Department of the Post Office for the edification and amusement of the clerical force has been the Beam wireless. This was originally intended to provide a Brighter London, but trade depression in commercial concerns was so severe that the effort was diverted to less useful purpose. It is hoped that when the Department is taken over by those financial interests who state they want to make money out of it, the Beams will scintillate still more.

OBITUARY.

MR. D. B. HOWIESON, NEWCASTLE-ON-TYNE.

IT is with deep regret that we record the death of Mr. D. B. Howieson, Traffic Superintendent, Newcastle-on-Tyne, who passed away after a short illness on Dec. 14 last. His death came as a great shock to his many colleagues and friends in all parts of the country, and particularly in the Newcastle and Glasgow districts, with which he has been so closely associated during his official career.

Mr. Howieson commenced his service in Glasgow in the Telegraph Branch in 1891, being appointed an Exchange Manager on the Telephone side in 1911 and Traffic Superintendent at Newcastle on April 18, 1926.

Although only a comparatively short time with us at Newcastle, he endeared himself to everyone with whom he came in contact by his fine personality and his great fund of good humour. It was characteristic of Mr. Howieson that everything he undertook to do he did thoroughly, and in times of stress or in the midst of distracting problems he could be depended on to relieve the situation by an anecdote appropriate to the occasion.

The interment took place at Heaton Cemetery, Newcastle-on-Tyne, on Dec. 16, and amongst those members of the staff present to pay a last tribute of esteem and affection were Mr. C. Creighton, Postmaster-Surveyor, Mr. J. D. W. Stewart, District Manager, Mr. J. Thompson, Traffic Supt., Glasgow (representing the Glasgow District Telephone Staff), Mr. Wickham, Traffic Superintendent, Mr. Robson, Chief Clerk, Messrs. Andrews and Bellwood, Sectional Engineers, Mr. B. Todd, Superintendent, S.B., and Mr. Knox, Postmaster, Whitley Bay.

Amongst the many beautiful floral tributes were wreaths from the District Manager's Office, Local and Trunk Exchanges, and from colleagues in all sections of the Glasgow Telephone Service.

PHONE-PHOBIA.

WE quote the following paragraphs by Miss Dorothy Dickson, the famous actress, from one of Messrs. Lyons' tariffs, where it appears under "Lyons' Sports Sheet":—

I have often wondered why so many people who ordinarily seem to have the most patient and kindly natures, become perfect bears as soon as they pick up a telephone receiver. At the sight of a telephone it seems that all their patience deserts them. They proceed to bully the operator almost before she has had time to repeat the number; all the nastiness of which they are capable is poured out over the telephone. Again I ask, why?

I have studied these telephone fiends pretty carefully, and I have discovered that they are all bullies at heart, and like all bullies they are also cowards, who do not dare to show this ugly side of their natures to people whom they meet face to face. The telephone operator provides an excellent invisible target for their arrows of abuse. The telephone is the safety valve which helps them to be more or less pleasant in ordinary conversation. It is so easy to be unpleasant to a person who cannot see you being unpleasant!

The telephone is an excellent test of character. A person who goes quietly into a telephone box and speaks charmingly to another unseen person is truly possessed of the educated heart. The precious "please" and "thank you," the smile of greeting which nobody sees, the soft, pleasant voice which broadcasts happiness wherever it is heard—these are the priceless things of life that are worth cultivating in order to make our world just a little more harmonious.

When you pick up a telephone receiver make a practice of smiling. It will help you to wait happily and patiently even if the operator does appear to have gone to sleep! And an occasional "please"—even though it does seem superfluous to you who are paying for your calls—may help you to get a little better service.

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THE WORKING OF THE INTERNATIONAL TELEPHONE SERVICE.

THERE was a very good attendance at the Institute of Electrical Engineers, Victoria Embankment, on the 16th ult., when Mr. H. G. Trayfoot, of the Telegraph and Telephone Traffic Section, Secretary's Office, G.P.O., read an interesting paper outlining the history and development of the Anglo-Continental from its one trunk circuit between London to Paris up to its world-wide extension possibilities made possible by long and short wave radio-telephony.

Very slow progress was made up to 1914, then came the war with its scientific advances as applied to grim uses, the armistice and the apparent stagnation for four or five years due to the shortage of material in all belligerent, and even non-belligerent countries, until in 1923 was held the Preliminary Technical Conference on European Telephony, the formation of the International Consultative Committee in 1924, and the happy suggestion and its acceptance by the International Telegraph Conference of 1925 to place the C.C.I. under the aegis of the latter but to give it a separate existence and organisation, with the result that since that day European telephone progress has been made to a degree that would have been incredible at any previous stage in its history.

Among those present in the audience were noticed Mr. Gill, to whom Europe owes so much of its present international telephone development, Mr. Erikson, allied in the same good work, our own Lt.-Col. A. G. Lee, so closely associated with Anglo-American wireless telephony progress, and also Col. Shreeve and Commander Latham, whose names need only to be mentioned in electrical circles for due homage to be paid them.

Unfortunately, before the Chairman had divined their united intentions, all five silently stole away, so that the pleasure of hearing their voices was denied to us.

In the regrettable absence of the Chairman, Mr. L. Simon, owing to pressure of official duties, one of the Society's Vice-Presidents, Mr. G. Morgan, C.B.E., ably filled the chair.

The subsequent speakers also proved particularly interesting in their remarks, Mr. M. C. Pink, Asst.-Controller Telephones, who voiced a general if pleasant discontent with the existing confusion arising from the initials I.C.C. and C.C.I., each standing for more than one meaning; Miss Cox, Superintendent Exchange Staff, who became reminiscent of the long-past day of the Trunk transfer to their legitimate home *and* staff and also of the day when she and others heard the guns booming over the London—Lille trunk; while Mr. W. J. Hilyer, of the International Standard Electric Corporation, also added materially to our general knowledge by his succinct remarks. Accord was complete regarding the excellent co-operation given and the excellent service rendered by the distinguished M. Valensi, Secrétaire-Général du Comité Consultatif International des Communications Teléphoniques á Grande Distance, on all and every occasion when the international committees met either on telephone or telegraph technical matters.

J. J. T.

ANGLO-HUNGARIAN TELEPHONE SERVICE.

THE Postmaster-General announces that, as from Wednesday, Feb. 1, the Anglo-Hungarian telephone service (already available from all parts of Great Britain to Budapest) will be extended to all parts of Hungary. The charges for a unit call (three minutes' duration) *to any place in Hungary* will be as follows:—

	Day. (8 a.m. to 9 p.m.)	*Night.* (9 p.m. to 8 a.m.)
	s. d.	*s. d.*
From 1st British Zone ...	15 6	9 3
„ 2nd „ „ ...	17 6	10 6
„ 3rd „ „ ...	19 0	11 6

The Zones are the same as in the other Anglo-Continental telephone services.

THE INSTITUTION OF POST OFFICE ELECTRICAL ENGINEERS.

BOOTH-BAUDOT AWARD.

THE Council wishes to call attention to the "Booth-Baudot Award" of £5 which is now offered annually for the best improvement in TELEGRAPH, TELEPHONE or WIRELESS APPARATUS or SYSTEMS. The award for the year 1927 is governed by the following conditions:—

1. The Award will be restricted to employees of the British Post Office.
2. Applications for the Award should be made between Jan. 1 and Mar. 31, 1928, and such applications should refer to improvements made, or suggested, during the twelve months ending Dec. 31, 1927.

   Attention is drawn to the fact that recipients of Awards via the Post Office Awards Scheme in respect to any improvement in telegraph, telephone or wireless apparatus or systems are eligible to apply for the Booth-Baudot Award in respect thereto.
3. The Award may be withheld at the discretion of the Council of the Institution of Post Office Electrical Engineers if, after full consideration of the applications received, the adjudicators appointed by the Council are of the opinion that no award is warranted.
4. Applications for the Award, accompanied by full details of the improvement, should be addressed to the Secretary, The Institution of Post Office Electrical Engineers, G.P.O. (Alder House), London, E.C.1.

R. V. HANSFORD,

December, 1927. *Secretary.*

THE C.T.O. PENSIONERS.

DESPITE the inroads made by Father Time upon the ranks of the Pensioned Ones, there was an increase of twelve in the attendance at the New Year's gathering held at the usual rendezvous at the Express Dairy's Bloomsbury premises on the 11th ult. In the absence of "Marshal Ney," who was unavoidably absent owing to building business at his riverside retreat, the chair was ably viced by Mr. E. L. Hilton, who has, it is understood, occupied a similar position on more than one previous occasion and in stormier times and conditions!

The arrangements were in the able hands of C.S.K., aided by that worthy and unobtrusive worker, H. Adams, who not only carefully checked the financial interests of the brotherhood, but collected the sum of 30*s.* for the flood victims from those present.

The names of those present will no doubt prove very interesting to both past and to many of the present members of the C.T.O. whose memories can take them back 5, 10, 15, or even nearly 20 years. There was actually an octogenarian at the gathering!

Messrs. W. W. Abrey, Geo. Adams, H. E. Adams, T. J. Allison, O. Arman, B. G. Askew, A. Bathurst, O. Bathurst, W. A. Batten, J. Bearman, H. E. P. Bell, G. T. Bennett, C. Bent, E. Bird, C. J. Boulton, H. J. Broughton, W. J. Callow, E. T. Chapman, H. W. Chapman, T. W. Charter, E. J. Clarke, H. C. Cook, J. H. Couldrey, J. H. Crook, H. G. Dicks, J. Downing, A. W. Edwards, O.B.E., J. S. Ellor, C. Elphick, H. W. Evans, F. Farman, C. J. Faunch, F. J. I. Fischer, W. S. Fisher, E. Fulcher, F. J. Furby, R. A. Furness, P. Garrood, J. N. Geary, W. E. Gibbins, T. W. Gunter, W. Haggerty, F. W. Harrison, J. Havard, H. E. Higgins, E. L. Hilton, G. Janes, A. E. Johnson, D. W. Jones, A. W. Judd, C. S. Keen, R. E. Kemp, G. F. A. Lange, E. Lewis, C. R. Lowe, A. W. F. Ludlow, W. H. Marshall, F. W. Miles, C. J. Minors, J. Morgan, S. Morris, R. H. Mulock, F. J. Muller, M. Packham, W. Payne, S. Pearce, H. J. Penney, W. T. Picking, E. F. Poole, L. W. Powell, W. Plumer, H. W. Senhenn, J. H. Sherrington, S. J. Smith, W. J. Town, H. Trollope, C. J. Turner, W. Turner, W. J. Twyman, J. J. Tyrrell, E. A. Ward, J. H. A. Warran, W. A. Webster, A. C. Wheeler and R. Young.

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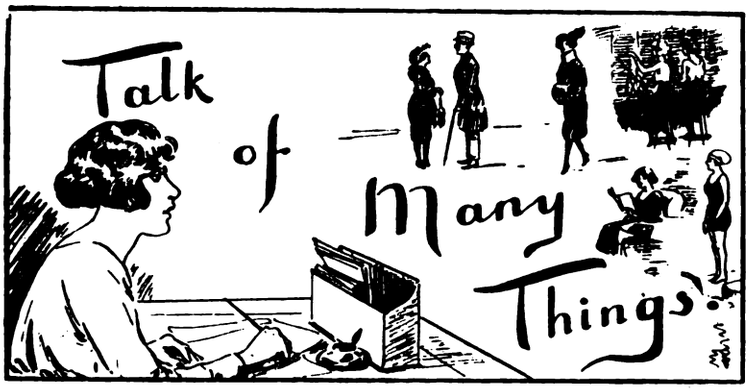
WE TELEPHONISTS



The Telephone and the Cinema.

RECENT statistics show that the average person visits the cinema once every week and that a great number "go to the pictures" twice and three times a week. The influence of the films on the public for good or evil is tremendous and has been a subject of much comment and debate; for we are all affected by what we see, even though we may be unaware of its influence at the time.

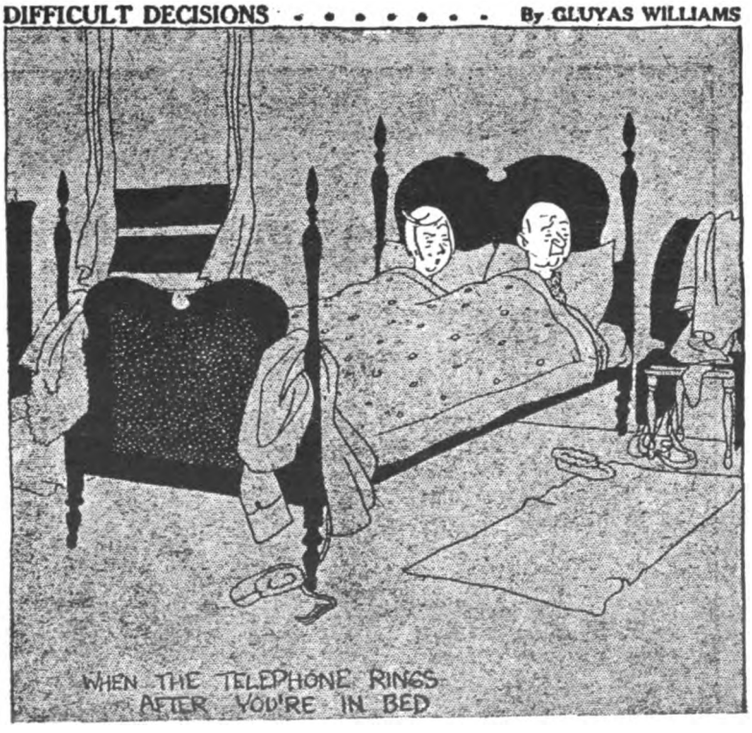
Now I have found from experience that in over 90 per cent. of screen romances the telephone plays an important part—a turn in the plot sometimes depending on its supposed use. "The Second Mrs. Fenway" is but one example out of many I could quote. Film producers find a place for a telephone (or two) everywhere—in a "movie" room we look for it as readily as for the door or table. I distinctly remember seeing one film in which the heroine considered it necessary to have her house so wired that she could telephone in her bath! and a bed telephone is quite common, of course. Office and boudoir, hotel and the cowboy's shack—they're all on the 'phone.

Mr. H. E. Powell-Jones was speaking a short time ago about persuading the public by means of advertising to acquire the telephone habit. There is probably no better spontaneous advertiser of the telephone than the photoplay, and one is tempted to believe that the great telephonic successes gained in America (the Big Home both of the telephone and the cinema) and in a lesser degree in our own country may be due in some small way to the prominence given to the telephone on the screen. For this large cinema-going public, imbued in some part with the same spirit which induces the youngsters to emulate Tom Mix by "acting as cowboys," becomes unconsciously familiar with the uses of the telephone. Thus, even though a business man in the humdrum of real life fails to observe the importance and indispensability of the telephone, yet once or more per week, by dint of an interesting story, the advantage of possessing a telephone is focussed on his undivided attention, and he is soon ripe for the canvasser.

Again, it rarely suits the purpose of the film producer to depict flaws in the use of the telephone—time is too precious and the story must proceed. As a result, film telephoning is somewhat Utopian. None of those hitches so inextricable from things human occur; no directories are ever consulted, there are no "number engaged" troubles and no delays; one merely touches the receiver and before a normal operator could say "Number, please?" one is through to the desired client (who is always in, of course). Trunk calls are made with the impassivity of an archangel. In fact, the way these film actors manipulate the instruments makes one wonder whether "automatics" are superfluous—all of which is very excellent advertising and gives the public a good impression.

However, in one particular we score over the Utopian telephony of the screen—we, in real life, make the instruments automatic, while reserving for ourselves the right to be human.

A. J. C., Preston.



[*With acknowledgments to the "Evening Standard."*

A.D. 1948.

And I saw in my dream a satisfied subscriber cheerfully awaiting the telephonist and chanting an old lay. And I caught the words "together" . . . . and "happy . . ."

M. CLAYTON.

A Telephone Romance.

(*Continued.*)

After they were "fully established" in their new home the bride suggested having a house warming, and as she had "Passed her efficiency test" at the "Local" "School" she volunteered to do the cooking herself.

The next morning she "Engaged" a maid at the "Registry" Office, who proved to be a "Civil Servant" but "Slow in clearing." From there she visited the market on a "Provisional" expedition, and here the surroundings struck an "Answering cord" in her memory, forming a "Connecting" link, for she had often been escorted here by her father in her childhood's days. After making "Special enquiry," she purchased a "Buff" "Orpington," which she was able to get at a "Reduced rate" (although the salesman said that it was on the "Top line" for birds), and as she did not ask for "Credit" she was given "Priority" and received "Preferential treatment." She would not allow them to send it home, although there was "No charge," but carried its "Buff form" in her arms. She felt very satisfied with her bargain, as her idea was not to "Break jack" (which was her pet name for her husband), for that would mean "Jack ending" his career. The next day she washed the "Blue print" covers, and later found that she had "No lines"; then "Had a faint recollection" of "Lending lines" to an "Adjacent" friend; when these were returned the maid, who was a close "Attendant," volunteered to "Hold the line"

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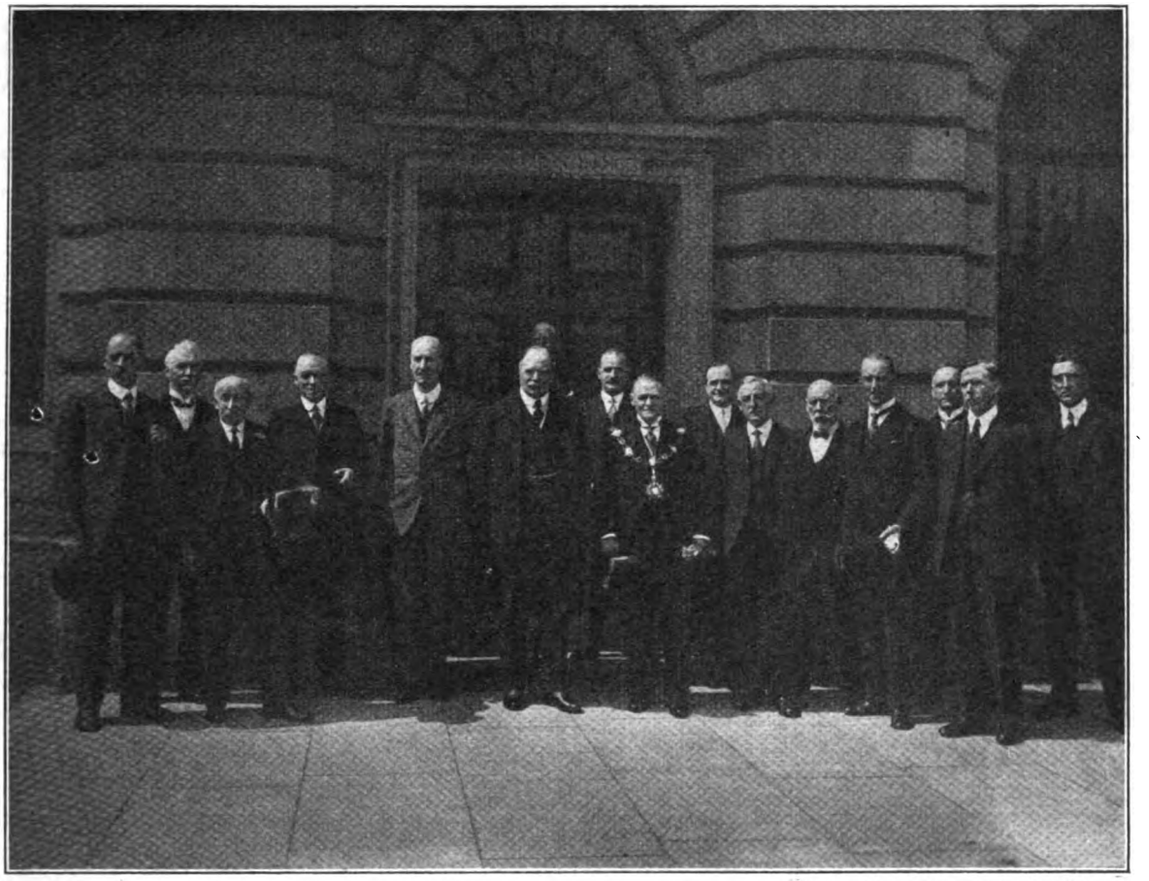

[Photograph by W. T. Carter, Rochdale.

OPENING OF ROCHDALE NEW POST OFFICE.

The above group was taken at the opening of the new Post Office at Rochdale last summer. The following officers and others were present (left to right) :—

1. J. M. SHACKLETON, Esq., Suptg. Engineer, N.W. District. 2. W. H. HICKSON, Esq., Town Clerk, Rochdale. 3. J. R. HEAPE, Esq., Rochdale. 4. A. R. MYERS, Esq., Chief Architect, H.M. Office of Works. 5. RANDAL BELL, Esq., Surveyor, N.W. District. 6. Lord DERBY. 6a (behind Lord Derby) R. B. RICHLEY, Esq., Clerk of Works. 7. H. WYCHERLEY, Esq., Deputy Mayor, Rochdale. 8. C. H. BRYNING, Esq., Mayor, Rochdale. 9. W. T. KELLY, Esq., M.P., Rochdale Borough. 10. T. HOWARTH, Esq., J.P. (Messrs. R. & T. Howarth, Contractors.) 11. W. CLARK, Mayor's attendant. 12. V. R. KENNY, Esq., M.B.E., Asst. Surveyor, N. W. District. 13. S. O. ALLEN, Esq., District Manager, N. W. District. 14. R. A. MOFFATT, Esq., Postmaster, Rochdale. 15. R. C. BALCOMBE, Esq., Sectional Engineer.

while the bride "Pegged them" with "Plain white pegs" and afterwards aired them on the "Fire line." Later in the day she was in a "Busy position" near the stove, her face a "Permanent glow." Here she had "All facilities" for cooking, and was anxious to make a good "Display." A "Hen-don" to a turn was used for soup, and after cooking the "Buff" "Orpington," she "finished" by making a "Current" tart.

As she had had a "Morning in" she thought she would like to "Lunch out," and on her return she rested during the "slack period" and then "changed" into her favourite dress (which she had "cut out" herself) namely "Red with a white dot" trimmed with a "Pouch" and "Finished" with a flowing "Panel"; she then did her hair in a beautiful "Wavy line."

About six o'clock "General Delay" from the "Canadian Service" arrived with a "Chattering relay" of friends. "General Post Office" arrived later and apologised for his "Late attendance," which he said was due to a "Traffic delay"; he added that he had to use an "Alternative route" and that he was further handicapped by his "Local knowledge" of the district being "Poor"; this the hostess had "No option" but to "Excuse" and then "Allotted" him a "Peg" to "Hang up" his "Service" "Cap."

The bridegroom, who arrived "keyless," had missed his "Connexion" and had had to run for a bus which he caught in a "Tick," but as he had always had a good "Running record" and had once broken the "All-London record" for "Speed" he was able to do this without effort; he then hurried home by a "Short circuit," but as the "Bell" was "Out of order" he could give no "Warning" of his arrival, and had to wait a long time before being "Answered."

The bride was just relating how, on the slippery day, she had gone from "Point to point" and eventually slipped down the "Wrong" "Area" and was treated by the "Medical Officer" for "Shock," when dinner was "Announced." The bridegroom, who had previously said that he would "Deal with" the bird himself, was "Allotted" the task of carving, but was at first "Unable to cope," this being due to "Poor manipulation"; he was also slow in "Tendering" the portions, so that each guest "Received"; a "Slow assignment."

At the "Termination" of the meal, the maid, "Using her initiative," and with "Discretion," "Challenged" the guests with, "Have you finished?" and then "Cleared."

Several presents were then presented to the happy "Couple," including a "Print," "White with black engraving," and a "Tin" of "Plug," which was the bridegroom's "Choice," and as he had always been a heavy smoker they felt that there would be no "Idle plug" left in the tin. After their "Prolonged call" the guests, after an "Exchange" of good wishes, departed, the majority to travel via "Willesden" "Junction" and the "Rest" to "Waterloo." We will now "Leave" the happy couple standing in "Tandem" beneath "Goffs Oak" (which was the scene of their first meeting) with a carpet of "Lee Green" beneath their feet and their faces turned to the "Western" sun; we trust that their affection will be "Retaining" and that they may "Speedwell," also that their way may be a "Purley" path up a "Primrose Hill," with no "Hayes" to cancel their happiness.

THE END.

D. D.

Sydenham Exchange.

A very successful Social was held on Jan. 3, 1928, at the Hamilton Hall, Forest Hill, in aid of the Exchange Library.

Mr. Townsend again obliged by acting as M.C., and his duties throughout the evening were somewhat arduous.

Our thanks are extended to Miss Bowley for her interest in the organisation of the Social.

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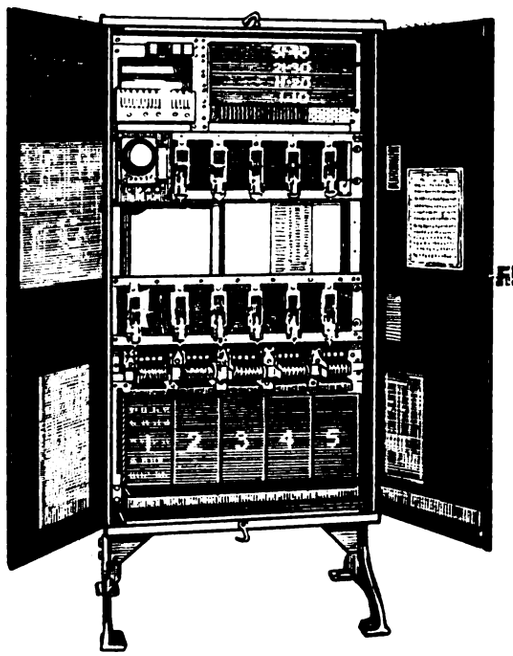

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By A. G. FREESTONE,
of the Automatic Training School, G.P.O., London.

This book explains as simply as possible the operation of the Call Indicator Circuit, without discussing the higher technicalities of the subject. The apparatus and circuits described are those installed in the Manual Exchanges of London in order to enable them to work in conjunction with the Automatic System during the Transition Period. The study of this book will be valuable to all students of telephony as well as engineers wishing to keep themselves up-to-date.

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DEAN FOREST.—SEVERN-WYE VALLEYS. Beautiful Holiday Home (600 ft. up). 70 rooms, extensive grounds, motors, golf, billiards, tennis, bowls, croquet, dancing. Electric light. Boarders 50*s.* to 67*s.* 6*d.*—Prospectus: Littledean House, Littledean, Glos.

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Songs were well rendered by the Misses Cleave, Arnott, Jones and Whibley, while the violin and concertina solos were much appreciated. It was a matter for regret that time did not permit the audience to see more of Miss L. Brereton, whose exceptional talent was so well expressed in her solo dance. Thanks to the keen interest and enthusiasm displayed by the artists, the "Kirkdale Cronee's Revue" turned out to be a real success. The Chorus was trained by the Misses Picard and Brereton and the performance was very creditable. An amusing item of the Revue was the "Charladies Quartette," ably rendered by the Misses Arnott, Hammond, Bennett and Lock. Miss Whorwell took the part of "Mr. Matchmaker" in "The Registry Office" with ability, and each "applicant for marriage" acquitted herself well. The Sketch—"Travelling Abroad"—was successfully played, with the Misses Songhurst, Hammond and Bennett taking the chief parts, while "Teddy" and "Winifred" were splendidly portrayed by the Misses Lock and Payne. The parts of "Mr. and Mrs. Newlywed" were played with success by the Misses Dunton and Shingleton while those taking the parts of the French Customs Officers and the Swiss maid deserve special mention. Songs in French were sung by the Misses Mash and Jones, and Miss Huchin lent colour to the Sketch with her Oriental dance. We are indebted to outside friends for completing the "Strolling Players" quartette and we thank them for their assistance.

["Belfast Telegraph" copyright.

Mr. ALLAN MACLEAN,

Late District Manager, Belfast, notice of whose retirement, together with a short biographical sketch, appeared in our last issue.

A presentation of a book of Poems was made to the Producer, who afterwards thanked the artists for their splendid work.

We cannot too strongly emphasise our gratitude to Mrs. Brereton and Mrs. Lock for permitting rehearsals to take place at their homes. When one considers that the "Revue" comprised over thirty performers, the extent of our indebtedness can be realised.

We shall be glad again to welcome our many friends at a Dance and Whist Drive to be held on Feb. 7, 1928, and hope to record the same financial success as the Social has enabled us to do.

G. M. T.

Contributions to this column should be addressed: THE EDITRESS, "Talk of Many Things," *Telegraph and Telephone Journal*, Secretary's Office, G.P.O. (North), London, E.C.1.

BRIGHTON AUTOMATIC TRANSFER: VISITING THE SUBSCRIBERS.

BY GEO. H. CALCOTT, *Asst. Traffic Superintendent, Brighton.*

ONE of the most important jobs to be undertaken prior to an automatic transfer is the instructing of the subscribers; on it largely depends the success of the transfer from a traffic point of view, dialling troubles are reflected in unnecessary calls on the O levels.

As the Brighton transfer was a complete success both from the Engineering and Traffic points of view, it is thought that some details concerning the organisation for educating the public may be of help to those who are engaged in the preliminary work in other districts, incidently the humorous side may appeal to those not immediately concerned.

Unless redundant staff is available it is customary to recruit the prospective visiting officers from the Labour Exchange, and here it is possible to enlist the help of the Labour Exchange Manager, who is generally quite able and willing to make a preliminary selection, so that the Traffic Officer has only to sift out the best men. For this purpose, however, he will have to be like Pharoah of old, and "harden his heart," because it is impossible in a short interview always to do the right thing.

Having chosen the men the next step is to impart the requisite knowledge, and this does not present much difficulty as the standard instructions plus the experience of other districts can be drawn upon in order to draw up a set of instructions which any person of ordinary ability can understand.

Fortunately, in Brighton a large room was available (the old sorting office at the Head Post Office), in it were installed the various plans which the visiting officers would meet in the course of their visits.

The following synopsis of the lectures is given:—

PRELIMINARIES.

First Day.

(1) Name and address of each man.
(2) Signature to forms P. 10, P. 13.
(3) Insurance cards.
(4) Obtain signature for temporary pass cards.
(5) Conditions of employment.
(6) Hours of { duty 9 a.m. to 5 p.m.
training do.
(7) Afterwards 8.30 a.m. to 5 p.m. (1 hour for lunch).
(8) Dining Rooms at G.P.O. and North Road.
(9) Supply set of instructions to each man.
(10) Notebook, pencil, envelopes, &c., to each man.

NATURE AND OBJECT OF WORK.

(1)—(*a*) Its importance.
(*b*) Method of working.
(*c*) Supply instruction cards.
(*d*) Confirm directory particulars, &c.
(*e*) Compilation of data for various forms.
(2) Describe the present Telephone system in Brighton, contrast the new.
(3) Explain various telephone systems, i.e. magneto, C.B.S., C.B., and Automatic.
(4) Apparatus used by subscribers (exhibit).
(5) The various conventions used.
(6) Numbering scheme, why it is necessary to change numbers.
(7) Direct exchange line, the basis of the instruction—(*a*) pedestal, or (*b*) wall instrument—(exhibit the different types).
(8) The Dial, how it is used, contrast with former method of obtaining calls (exhibit Dial).
(9) The exchanges obtained by dialling, i.e. the automatic area.
(10) A straightforward call in the Automatic area, describe each operation in detail from the lifting of the receiver.
(11) Emphasise the importance of dialling the exchange required first.
(12) Points on which the caller must be clear.
(13) How a local call is charged.
(14) A straightforward call outside the automatic area, i.e. London, demonstrate and describe in detail.

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(15) Flashing on trunk calls.
(16) How to obtain telegrams, describe and illustrate the method.
(17) How a fault or difficulty is reported.
(18) Enquiries regarding other P.O. services, accounting queries, &c.
(19) The difference between a straightforward call and a difficult call—
(*a*) engaged call;
(*b*) lines temporarily out of service;
(*c*) calls to spare numbers.

Second Day.

(1) Give a set of questions on previous day's work, correct and answer.
(2) Invite questions and answer.
(3) Visit demonstration set to hear tones.
(4) Examination of apparatus and practice. Each officer should have a thorough knowledge of preceding points before the next steps are taken.
(5) Exhibit direct line card, demonstrate how to insert telephone number.
(6) Instructions *re* fixing.
(7) Reports to be furnished.
(8) Explain each type of form and how to complete.

Third Day.

(1) Questions on previous day's work.
(2) The difference between the direct line and other installations.
(3) Auxiliary line.
(4) Installations wired to plan Nos.
(5) Describe in detail plan I.
(6) Emphasise the importance of listening for dialling tone.
(7) Describe in detail the cards to be exhibited at main and extension points.
(8) Plan I*a* difference between (other points in detail as for Plan I).
(9) Demonstrations of cards and all points covered, also practice on these installations.

Fourth Day.

(1) Questions on previous day's work.
(2) Various other plans in detail.
(3) The different cards to be exhibited and practice on all these installations.
(4) Combination of plans, i.e. plan 1 and 4, 5 and 7, &c.

Fifth Day.

HALL MULTI COIN BOXES.

(*a*) Mechanism.
(*b*) Different classes of calls.
(*c*) Notices.
Special instruction to be given in those cases where Hall boxes are wired to plan numbers.

Sixth Day.

RECAPITULATION.

(1) Go over every card again.
(2) Reports and office procedure.
(3) Queries.
(4) Dialling Tops.
(5) Directories.
(6) Rottingdean and Southwick now in local fee area.
(7) Extensions with coin boxes, i.e., other than Hall boxes.
(8) Draw attention to special arrangements at Rottingdean and Southwick.
(9) Final instruction as to duties for the following week.

(*To be continued.*)

LONDON TELEPHONE SERVICE NOTES.

Contract Branch.

THE amount of business done by the Contract Branch during the month of December was as follows:—

	Stations.
New business obtained	6,878
Ceasements	4,108
Net gain ...	2,770

During the year 1927 a net growth of 27,706 lines (8.9%) and 45,621 stations (8.8%) was realized in London.

Anyone who was interested in the unsolicited testimonial to the efficiency and courtesy of the service which we quoted last month may be interested in the following letter which was received just before Christmas:—

"In these days when one hears so much irresponsible talk of delays and discourtesy, &c., in connexion with the Telephone Service, I should like to send a word of personal thanks to you for your Department's *keenness* and *promptitude* in installing our two new exchange lines.

"You will be glad to know that this has been of considerable value and convenience to us, especially in view of the extremely busy season which we are now experiencing."

The Automobile Association required two additional lines to enable them to cope with reports as to the snow-blocked roads during the recent storm. The order was given on the Saturday forenoon and the work was completed the same day.

The South-East Contract Office has suffered a severe loss in the retirement of Mr. W. F. Hall, which took place on Jan. 4, and it is not too much to say that the loss will with difficulty be repaired. Mr. Hall entered the service of the National Telephone Company on Jan. 18, 1907, and had a varied experience in the City, South and South-East Contract Offices.

His colleagues bade him a formal farewell at a meeting on Dec. 30, when the District Contract Manager, in their name, presented him with a suitably engraved umbrella and a quantity of organ music in token of their esteem and regard for him. The Contract Manager, in making the presentation, referred to the very efficient manner in which Mr. Hall had performed his duties and to the regret everyone felt at his departure. He referred to the fact that Mr. Hall's name was almost invariably at the top of the list of orders obtained. It is interesting to note that the appreciation of Mr. Hall's services and personality came not only from his present colleagues but also from some who have now left the service.

Mr. Hall carried with him the best wishes of his colleagues for his future success.

* * * *

Post Office Sanatorium Society.

The second concert this winter organised by the L.T.S. was given at Benenden Sanatorium on Saturday, Jan. 14, to an appreciative audience of patients and staff of about 150. The artists were the Misses P. Pidgeon and M. M. Worth and Messrs. Hugh Williams, J. F. Hughes and T. Watler, with Mr. A. C. Vincent as accompanist. At the close of the concert, Dr. Spurrier, the medical officer, thanked the L.T.S. for organising the concert, and the artistes for their excellent performance, and emphasised the beneficial results such concerts have in brightening the lives of the patients, who naturally find the winter evenings tedious and irksome. Miss Worth, the secretary of the L.T.S. Constituency, suitably replied.

Three concerts in all are being given this winter, the expenses being defrayed by a "penny" collection amongst the staff, which realized over £35.

* * * *

Football.

Very little football was possible during the period just before and after Christmas. Frost and snow followed by rain, played havoc with the ground at Raynes Park, which for a time afforded splendid skating facilities, and later formed part of a vast lake. Subsequently the important Cup Tie announced for Jan. 7 was postponed.

A further disappointment was experienced the following Saturday when both teams were in attendance but the referee declared the ground unfit. It is doubtful if the match can be played there as the ground does not seem likely to recover for some time, and the match must be decided at an early date.

In view of the difficulties being experienced with the ground steps will have to be taken to obtain accommodation elsewhere, and it is almost certain that fresh quarters will be found for next season.

* * * *

Netball Competition.

Following the generous offer of a Cup by Miss J. Liddiard, the Sports Association have arranged a Netball Competition. Nineteen entries were received and the following teams meet in the First Round:—

Central *v.* Kensington	Rodney (A) *v.* Tandem.
A.R. 2 *v.* A.R. 3.	A.R. 7 *v.* Rodney (B).
A.R. 6 *v.* Riverside.	Trunk (A) *v.* A.N. & Address.
Croydon *v.* Thornton Heath.	A.R. 4 *v.* Avenue.
A.R. 1 *v.* Clerkenwell.	Trunk (B)—Bye.

The progress of the Competition will be reported in these notes.

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THE

Telegraph and Telephone Journal.

VOL. XIV. MARCH, 1928. No. 156.

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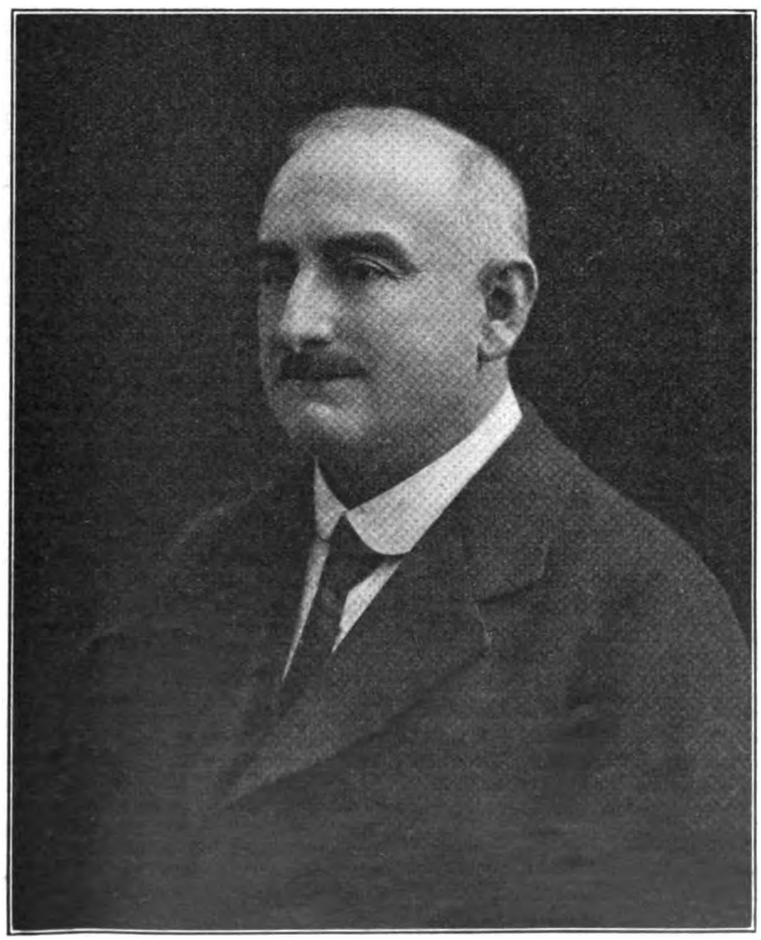
TELEGRAPH AND TELEPHONE MEN AND WOMEN.

L.

MR. F. S. J. O'SHAUGHNESSY.



"Beam" wireless services are so much in the forefront at the present time that is is appropriate that the portrait this month should be that of Mr. F. S. J. O'Shaughnessy, Superintendent, Cable Room Establishment, Central Telegraph Office, who is particularly identified with the Beam Section of the Central Radio Office.

Mr. O'Shaughnessy, who is 55 years of age, has spent the whole of his official career in the Central Telegraph Office, and what he does not know about telegraph practice in general and international telegraph practice in particular is hardly worth knowing. He has been attached to the Central Radio Office since its inception and has seen it grow from small beginnings to the large organisation with a staff of 300 men which it is to-day.

During the past year, which saw the opening of Beam Services to Australia, India and South Africa, Mr. O'Shaughnessy's responsibilities have been particularly heavy, and the success of the new services has been due in no small measure to his organising ability. His burdens might have weighed heavily on any man, but fortunately he is gifted with a ready wit and a happy disposition which have carried him through the year and left him with undiminished vigour and zest to face further developments as they come along.

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THE TRANSATLANTIC TELEPHONE SERVICE.

JOINT SESSION OF THE INSTITUTION OF ELECTRICAL ENGINEERS, LONDON, AND THE INSTITUTE OF ELECTRICAL ENGINEERS, NEW YORK.

MANY readers of this Journal will have noticed in the daily Press recently a brief account of a joint session of the British Institution of Electrical Engineers in London and the American Institute of Electrical Engineers in New York, and may be interested in some further account of an event which must have brought a touch of romance even to the most habitual and blasé use of the telephone as a means of communication.

The American Institute had arranged to hear at its annual mid-winter meeting two papers on the transatlantic telephone service, and it was in connexion with these papers that the idea of a joint session by means of the radio link with the British Institution was developed. In London the Lecture Theatre of the I.E.E. was full to overflowing at 3 p.m. on Thursday, Feb. 16, when the proceedings opening with the first presentation of a most graphic film called "Voices across the Sea," depicting the progress of a call from San Francisco (Cal.) to Plymouth (Eng.). The film conveyed to the mind, in a way impossible by other means, a sense of the great distance covered by such a call (in this hypothetical case some 7,000 miles) and demonstrated clearly the steps involved in the connexion and, in particular, the differences in the paths of the incoming and outgoing speech, the former crossing the ocean from Rocky Point, Long Island to Cupar, Fifeshire, and the latter from Rugby to Houlton, Maine. No one interested in the romance of long-distance communication, or in the romance of human achievement, should fail to see this film when it is "released" for general public exhibition.

After the exhibition of the film, the two meetings were simultaneously addressed by the chosen speakers. In London, those in the lecture theatre heard all the addresses from a loudspeaker suitably situated, the British speakers using a transmitter placed in the Council Chamber, and in order to identify the speaker holding the meetings at the moment, and thus to dispel the natural doubt as to whether he was in London or in New York, his photograph was displayed on the screen during his remarks. In New York, the arrangements were exactly similar, loudspeakers in the auditorium of the Engineering Society's building conveying to the audience the words spoken in both London and New York.

At the commencement of the joint proceedings, Mr. Bancroft Gherardi, President of the American I.E.E., invited Mr. Archibald Page, as President of the older, British, I.E.E., to act as Chairman of the joint meeting. Mr. Page then spoke to both the meetings, predicting that the occasion would be long remembered by all present and would be quoted by succeeding generations of electrical engineers as marking an important milestone in the advancement of electrical science.

Mr. Gherardi followed with an address in which he referred to the steps in progress by which telephonic communication had grown from its crude beginnings to the wonderful event of the moment. Mr. Page then spoke again, in the name of the British Institution of Electrical Engineers, welcoming the advent of a means of communication which would assure closer and closer association between the English speaking races. Dr. F. B. Jewett, Vice-President of the American Telephone and Telegraph Company, following, spoke of the co-operation which had made this event possible.

Col. T. F. Purves then addressed the joint meeting, speaking of the wonder and romance of the occasion and of the great possibilities which it opened up for closer relationships between nations by the simple and natural medium of direct speech to a combined audience.

General J. J. Carty then proposed the following resolutions :—

"Whereas on this sixteenth day of February, 1928, the members of the Institution of Electrical Engineers assembled in London, and the members of the American Institute of Electrical Engineers assembled in New York, have held, through the instrumentality of the transatlantic telephone a joint meeting at which those in attendance in both cities were able to participate in the proceedings and hear all that was said, although the two gatherings were separated by the Atlantic Ocean ; and as this meeting, the first of its kind, has been rendered possible by engineering developments in the application of electricity to communication by telephone ; therefore ;

"Be it resolved that this meeting wishes to express its feelings of deep satisfaction that, by the electrical transmission of the spoken word, these two national societies have been brought together in this new form of International Assembly, which should prove to be a powerful agency in the increase of good will and understanding among the nations ;

"And be it further resolved that a record of this epoch-making event be inscribed in the minutes of each society."

These resolutions were seconded by Sir Oliver Lodge, and carried unanimously by each section of the meeting, which then adjourned.

So ended an event likely to become historic in the annals of telephonic progress, a first step opening up a vista of immense possibilities.

The whole of the arrangements passed off without a hitch, every word spoken in New York, even the applause of the audience there, being clearly heard by the meeting in London. It may be mentioned that this was the first occasion upon which a loudspeaker has been used for the reception of transatlantic speech in public.

W. C. G.

RETIREMENT OF MR. A. RAMSAY LAMB.

IT was with many regrets the Staff of the District Manager's Office, Chester, bade farewell to Mr. Lamb, who had been their District Manager for a period of 15 years and who retired on Jan. 31. The farewell function took the form of a Whist Drive and Dance, arranged by the Staff. Mr. G. W. Campbell, Contract Manager, acted as Chairman and Mr. A. Roberts, Staff, Officer, kindly undertook the duties of Host. In addition to the personal staff, several visitors were present, including Mr. Baillie (Surveyor, North Wales District), Mr. Gauntlett (District Manager, Liverpool), Mr. Urwin (Contract Manager, Liverpool), Mr. Calvert (Head Postmaster, Chester), Lt.-Col. Todd (Head Postmaster, Stoke-on-Trent), and the Head Postmasters from Conway, Whitchurch, Llandudno, and Wrexham.

Presentations were made to Mr. Lamb by Mr. Gauntlett on behalf of the District Managers, Mr. Calvert and Lt.-Col. Todd on behalf of the Head Postmasters in the North Wales Survey, each of whom paid high trubite to the kindliness and courtesy which had always been displayed to Head Postmasters throughout the district.

Mr. Baillie, the Surveyor, kindly made the presentation on behalf of the staff. In wishing Mr. Lamb happiness in his retirement, special reference was made to Mr. Lamb's career with the National Telephone Company and to the tremendous change which took place after that Company was absorbed into the Post Office.

Tribute was paid to the extraordinary way in which Mr. Lamb had adapted himself to the new requirements. All present then joined in singing "He's a Jolly good fellow."

In replying, Mr. Lamb spoke very feelingly of his association with the District Managers throughout the country, and with the Head Postmasters in the North Wales Survey. His remarks as to the kindly treatment received from Mr. Baillie and his thanks to the staff for their loyalty and help, will long be remembered by those present.

The presentations took the form of an electric standard reading lamp from the District Managers, a silver tray and delicate china coffee cups, &c. from the Head Postmasters, and a Chesterfield suite, solid silver salver and two Pouffes from the Staff. Mr. Lamb had previously received a silver coffee service from the Staff of the Surveyor's Office, Shrewsbury.

After the dance, the evening ended with the singing of "Auld Lang Syne."

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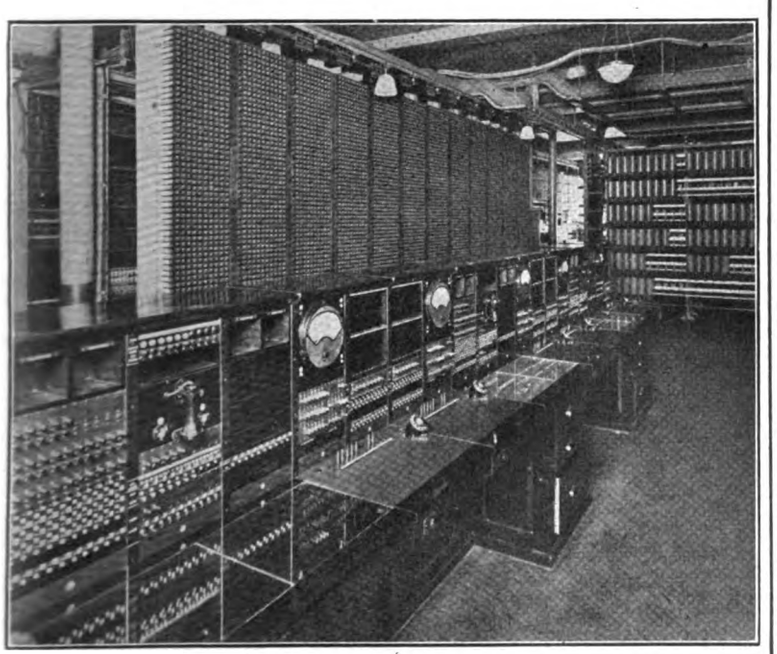
CONVERSION OF NOTTINGHAM AREA TO AUTOMATIC WORKING.

NOTTINGHAM enjoys the distinction of figuring as the first English city in the 1928 Post Office programme of conversions from manual to automatic telephones. The work of construction and preparation has been in progress for some considerable time, and the inception of the automatic system marks another era in the history and development of a city already rich in historical and industrial archives. Chosen by the Danes for winter quarters in 868, Nottingham constituted one of their five burghs. William I erected a castle there, which was demolished in 1644 by Cromwell's orders after being held alternately by the conflicting forces during the Civil War. Parliaments were held at Nottingham in 1334, 1337, and 1357, and it was the scene of the conference of the judges with Richard II, in August 1387. Edward IV assembled his troops at Nottingham in 1461, and it was the headquarters of Richard III before the Battle of Bosworth, in 1485. In later years, Nottingham became the centre of the lace-making and cotton-hosiery industries, nearly all British laces being made there. It was in Nottingham that Richard Arkwright, in 1769, erected the first spinning frame ; it was here, also, that James Hargreaves sought sanctuary in 1768 and reconstructed his " Spinning Jenny " after its initial destruction by the mob at Blackburn.

Towards the close of the 18th and the beginning of the 19th centuries, Nottingham was, in fact, the theatre of contending forces arising out of the substitution of mechanism for slower manual processes, and witnessed the Luddite disturbances of 1811. The Luddites were bands of rioters organised for the purpose of destroying machinery, under the mistaken impression that it led to unemployment. The leader of these bands took the name of " General Ludd," and the riots began with the wanton destruction of stocking and lace frames, but ultimately gave way to severe repressive legislation. In a sense, therefore, the introduction of Strowger automatic telephones into Nottingham is a case of history repeating itself, although, in these more enlightened times we all recognise the benefits which mechanism confers upon the community, and there is no likelihood to-day of the resurrection of a " General Ludd."

With a population at the last census of some 263,000, the city calls for adequate telephone facilities, and the present scheme covers a multi-office Strowger Automatic Network, comprising the Central Exchange in George Street, and three satellite exchanges, Sherwood, Arkwright Street, and Basford, respectively.

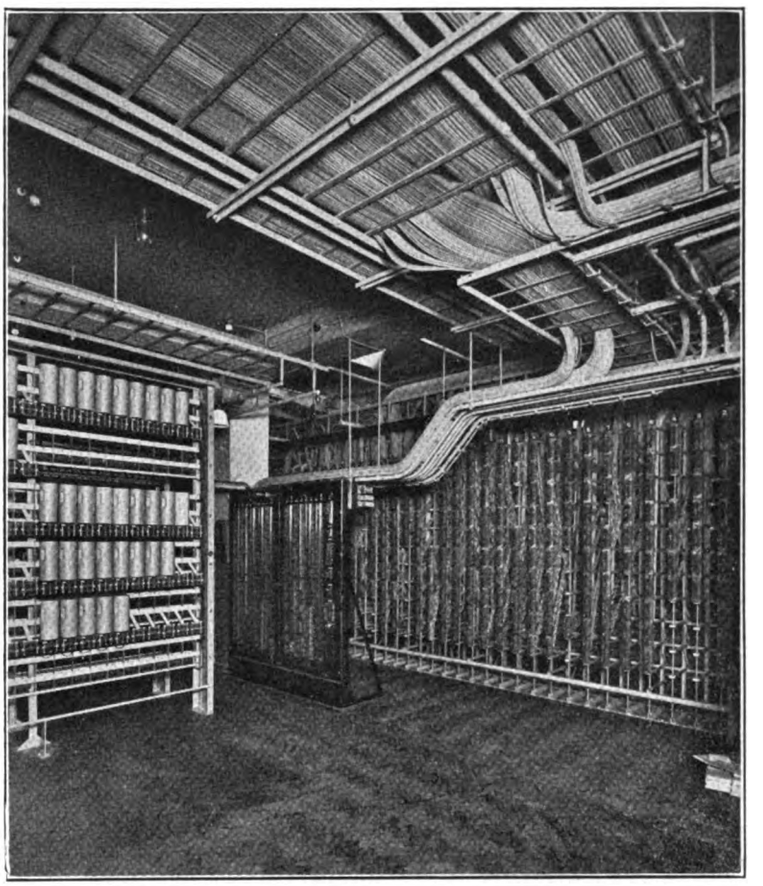


NOTTINGHAM CENTRAL EXCHANGE.—SUBSCRIBERS' METER RACK AND TEST DESKS.

The system is four and five digit, some subscribers having four-figure and others five-figure numbers allocated to them. The initial digits of subscribers associated with Nottingham Central Exchange are 2, 3, and 4, respectively ; whilst access to subscribers whose lines terminate in the satellite exchanges is obtained by dialling initial digits " 6 " for Sherwood, " 7 " for Basford, and " 8 " for Arkwright Street. In other words, the directory numbers of subscribers in these three areas commence with the digits mentioned.

The following numbers are allocated to special services :—

Trunk and Junction operators	" 0 "
Phonograms	" 90 "
Enquiries	" 91 "
Service Lines	" 92 "
Rural Party Lines	" 93 "
Records	" 94 "
Test Clerk	" 99 "



SELECTOR TRUNK BOARD, MANUAL FUSE BOARD AND INTERMEDIATE DISTRIBUTOR FRAME. (NOTE COMPLEX OVERHEAD CABLING IN RUNWAYS).

Operators at the following manual exchanges will dial-in direct to Nottingham automatic subscribers, but outgoing traffic will still be handled manually.

Beeston.	Carlton.	Arnold.
Bulwell.	Radcliffe.	Ruddington.

The manual operators at Nottingham are also provided with facilities for extending calls incoming to Nottingham automatic subscribers from outlying manual exchanges.

Nottingham Central Exchange is at present equipped for 7,500 lines, of which 1,170 serve private branch exchanges, whilst 150 are allocated to coin-box telephones.

In addition to the necessary complement of lineswitch units, the Central equipment includes 12 trunk boards, accommodating the various group selectors.

The first group selectors at Nottingham Central Exchange serve both main and satellite exchanges, being concentrated at that point. Apart from lineswitch units, the switching equipment at the satellite exchanges is confined to second, third, and final group selectors.

The line switches at Nottingham main and satellite exchanges are of the " homing " type, being associated with the " graded " method of trunk distribution. Under this arrangement the wipers do not remain on the contacts corresponding with the trunk last used by that particular switch, but return to the " home " position whenever the calling subscriber replaces his receiver at the conclusion of a conversation. There are 25 sets of contacts in the " bank " of each homing lineswitch, one set constituting the home position and the remaining 24 being available as outlets to first-group selectors. On removal of the receiver by the calling subscriber, the homing lineswitch immediately searches the trunks outgoing to first selectors, in numerical order, commencing with No. 1. The advantages claimed for this principle of homing lineswitches, employed in conjunction with graded trunk distribution, are economy in switching equipment and more efficient trunking.

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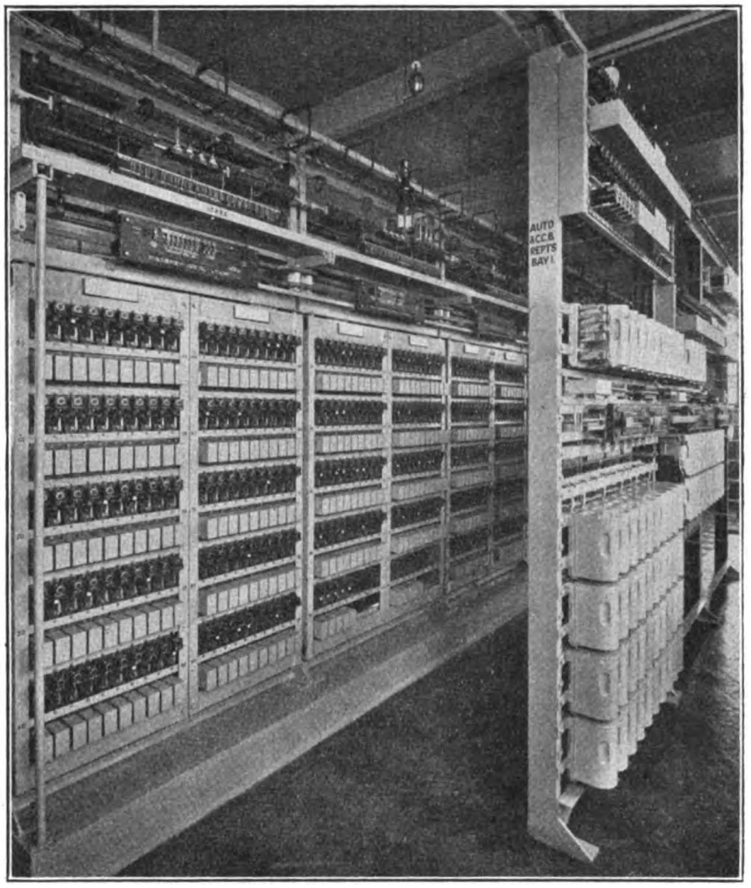
Of the three satellite exchanges, Arkwright Street has a present capacity of 1,500 lines and an ultimate, under existing arrangements of 2,000. The switchroom here is on the ground floor, and it is proposed at a later date to provide for further extension to an ultimate capacity of 3,400 by adding another floor to the accommodation already available.

Sherwood exchange is equipped for 2,000 lines, with provision for ultimate expansion to 3,200; whilst Basford serves 1,500 at present and aspires to 2,200 before its accommodation becomes unduly taxed.



SHERWOOD EXCHANGE.—LINESWITCH UNITS AND REPEATER RACK.

Each of the four exchanges is equipped with plant for furnishing the current necessary to operate the Strowger mechanism and energise the subscribers' telephones.

That at Nottingham Central comprises duplicate main storage batteries of Tudor Accumulator Co. manufacture. Each battery consists of 25 cells, arranged on single tier racks, the present capacity being 3,161 A.H. at the 9-hour rate. There is sufficient space in the lead-lined wood containers to increase this capacity to 5,640 A.H. in accordance with the growth of the exchange and the consequent increased demand for current.

Charging of these batteries is provided for by two motor-generator sets, furnished by Newton Bros., Derby. Each set comprises a protected type shunt-wound motor driven from the local 400 volts D.C. supply, direct-coupled to a shunt dynamo with provision for voltage regulation between 50 and 68 volts. The output is 900 amperes at 57 volts.

Current for ringing is furnished by one or other of duplicate ringing dynamotors, one of which, normally in service, is arranged to work off 200 volts D.C. supply, whilst the other, a stand-by machine, is wound to operate on current from the main exchange battery. In the event of failure of the city's electricity supply, ingenious automatic switching arrangements substitute one machine for the other and give warning of the failure, thus ensuring continuity of service.

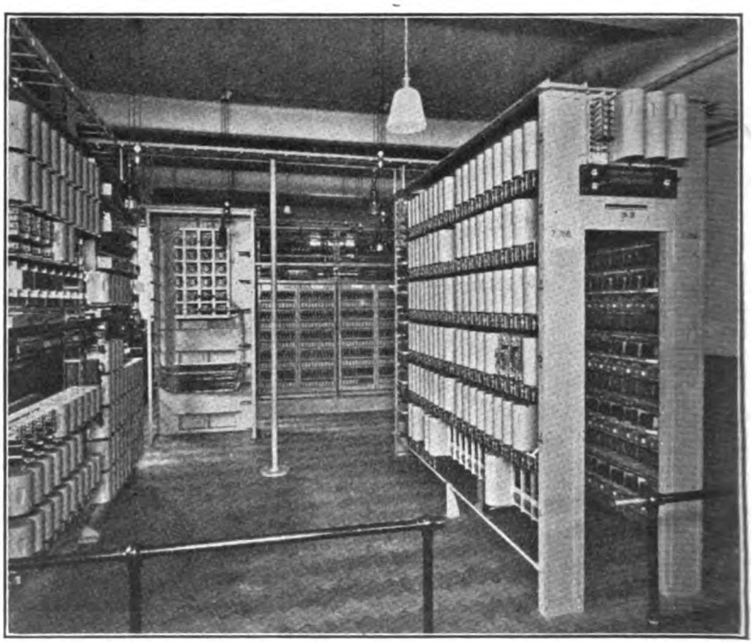
Control of the batteries and charging machines is concentrated on a three-panel power board which carries the necessary instruments and switchgear for this purpose. The motor-starting control gear comprises Brook Hirst pillars, embodying multiple lever-type starters with contractors; no-volt and overload release, and a D.P. slow-break isolating switch. Similar, though smaller power plants are installed at the satellite exchanges, Tudor batteries featuring in each. The charging machines, however, are by Cromptons of Chelmsford, and are only duplicated at Basford.

As with all other Strowger equipped automatic telephone exchanges on the Post Office system, those at Nottingham are furnished with very comprehensive supervisory equipment which, like the mechanism with which it is associated, is automatic in its action and simplifies maintenance to a routine standard. Broadly, the supervisory system, which varies in its application according to the particular section of the equipment with which it is associated, provides for giving visual, and in some cases, audible warning of an abnormal condition at any point in the exchange. All circuits terminate at the supervisory panel, and provision is made for classifying them as desired, into one of three grades of urgency—urgent, non-urgent, and non-audible. The two first-named are arranged to give both visual and audible warning by lighting warning lamps and ringing a bell, whilst the third grade light warning lamps only. This arrangement applies to both central and satellite exchanges, but in the case of the latter, which will frequently be unattended, there is a further provision for extending the supervisory circuits to Central exchange so that the whole Nottingham system may be supervised from that point when no local maintenance staff is on duty at the satellite exchanges. For this purpose the warning signals are classified into two grades only—urgent and non-urgent, the latter including the non-audible group.

It speaks volumes for the reliability of Strowger equipment and is a tribute to the efforts of those who have developed the system, that comparatively large exchanges, like the Nottingham satellites and corresponding sub-exchanges in other cities and towns, serving some thousands of subscribers, can be left to look after themselves for comparatively lengthy periods at week-ends and other times when a reduced staff is on duty, and without prejudicially affecting the service. As previously intimated, the supervisory circuits in such cases are extended to the Central exchange, and any abnormal condition arising locally during the absence of the staff is promptly and automatically recorded at the Central exchange, whence the position is handled, either by sending a man out to the exchange affected, or by instructing a local resident member of the staff to attend and do what is necessary, as indicated by the supervisory signals at Central. So thorough are the supervisory arrangements, that individual subscribers are seldom, if ever, aware that any abnormality has arisen, since it is dealt with long before it has time to affect them.

The only equipment individual to a subscriber, is his actual line to the exchange premises, the lineswitch on which it terminates, and the meter which records his calls.

Should any derangement occur in the intervening mechanism, such as the selectors which act as links between the calling and the called subscriber during the progress of a call, the act of momentarily restoring the receiver and re-dialling will pick up another normal switch in the group, which will extend the connexion in the usual way. Unless, therefore, his line is actually broken or deranged by storm or other unforeseen contingency, the subscriber served by this equipment is never likely to experience any dislocation of his telephone service.



BASFORD EXCHANGE.—REPEATER RACK, LINK FRAME, LINESWITCH UNITS AND SELECTOR TRUNK BOARD.

The whole of the automatic equipment for all four exchanges has been manufactured and installed to the order of the British Post Office by Automatic Telephone Manufacturing Company, Ltd., Strowger Works, Liverpool.

The grafting of an automatic system on to an existing manual network in a city the size of Nottingham, without interrupting the existing service, calls for the exercise of considerable engineering skill, and the Post Office Engineering Department is to be congratulated upon the satisfactory manner in which this revolutionary change has been brought about.

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TELEGRAPHIC MEMORABILIA.

AUSTRALIA.—At the annual meeting of Amalgamated Wireless (Australasia), Ltd., Sir George Mason Allard, chairman of directors, said: "While the profits from the 'beam' service are not of anything like the exaggerated proportions that have been reported, I hope that the results of the full year's working will be found satisfactory. Difficulties at the Canadian end have caused delay in the opening of the Canadian 'beam' circuit, but these difficulties are now being overcome, and the opening of the service is expected in the near future."

Mr. R. W. Dalton, Senior Trade Commissioner in Australia, in his annual report to the Department of Overseas Trade, and reviewing the general conditions in the Commonwealth, made the very interesting declaration that there was an increase in the imports of telegraph and telephone cable, almost all of which imports came from the United Kingdom.

AUSTRIA.—*World Radio* states that owing to bad weather, the construction of the new Linz station has been seriously interrupted, through the subsidence of some of the walls upon which an additional storey was being erected. The apparatus for the new station has arrived from London, and it is hoped that the station will be ready for work by the middle of the present month.

The transformation of the Rosenhügel station to a working capacity of 60 kw., and a nominal capacity of 200 kw., is proceeding rapidly, says the *Electrical Review*, and in a few weeks all will be ready. During the last few days of the change over it will be necessary for the Stubenring station to do all the work.

BELGIUM.—The United States Ambassador and M. Lippens, Minister of Railways and Communications, on Jan. 19, opened a wireless telephone service between Belgium and the United States. The experiment was highly successful, voices from America being heard with great clarity. The British and Belgian engineers who have carried out the work were warmly congratulated on the remarkable results achieved, says Reuter's Brussels Agency.

Communication was established via the Anglo-Continental cross-Channel submarine telephone cables and the British radio stations at Rugby and Cupar.

CANADA.—From Brandon, Manitoba, Reuter's Agency cables that Mr. Bracken, the Premier, promises that the Manitoba Government will erect a radio broadcasting station in that town, which will be the most powerful and up-to-date in Canada.

In a survey of engineering construction work in prospect for the current year in Canada, the *Times Engineering Supplement* states that the Bell Telephone Company of Canada alone intends to spend approximately $22,000,000 during 1928 on additions to plant.

"Wired-wireless," a system of communication which has hitherto been regarded as mainly applicable to relatively short-distance messages, is to be tried in Canada between Vancouver and Montreal, says the Canadian correspondent of the late *Westminster Gazette*.

At a cost of £500,000, the two cities are to be linked up by this new system, which is already proving a success between Montreal and Winnipeg, over a distance of 1,200 miles.

"Wired wireless," it may be added, is not exactly new to North America, as the system has been proved practicable in the United States over fairly lengthy distances.

CYPRUS.—The cable-laying vessel "Colonia" reached Haifa on Jan. 11 in connexion with the laying of cables between Port Said, Haifa and Cyprus on behalf of the Eastern Telegraph Company, says Reuter's Jerusalem correspondent. (See also under Palestine.)

CUBA.—A company has lately been formed in Havana, with the title La Compania Cubana Radio Telegrafica, to organise a wireless-telegraph service between Cuba and Spain.

CZECHO-SLOVAKIA.—The number of wireless subscribers at the end of last year exceeded 200,000. In 1925 the number increased to 18,000, says *World Radio*, and towards the end of 1926 reached 128,000. During 1927 the total passed 150,000.

EGYPT.—Further extensions of Marconi wireless telegraph services are announced. A direct high-speed duplex service was inaugurated between London and Constantinople on Jan. 1, and from Jan. 15 the Egyptian service hitherto operated by the British Post Office, as is now generally known, was operated by the Marconi Company in London and by the Marconi Radio Telegraph Company of Egypt in Cairo. The Abu Zabal station has been acquired by the latter company, and will in future be used only as a transmitting station, while a new receiving station has been constructed at Meadi, a few miles to the south of Cairo, in order to provide a high-speed duplex service in place of the present simplex service. Both the transmitting and receiving stations are connected by special landlines to a new central telegraph office in the city of Cairo, where all operating processes will be carried out. The transmitting equipment at Abu Zabal now comprises long-wave and short-wave transmitters and two additional transmitters for use with "beam" aerials which are in course of erection.

FRANCE.—Since the last issue of the *T. & T. Journal* the critical condition of the French Broadcasting stations has been considerably eased. The enforcement of a Decree Law which prohibits broadcasting by any private station has been modified, says the *Daily Telegraph*. The decree, signed by the Minister of Commerce in December, 1926, actually came into effect on Jan. 1, but the broadcasting companies were allowed one month's grace, which expired on Feb. 1, though in the case of the Radiola Company the period of grace was six months. All the other broadcasting stations were reminded by a Ministerial circular that their activities must cease until a new arrangement for the control of broadcasting had been elaborated. Urgent representations were made to M. Poincaré and to the Minister of Commerce, for relaxation of the strict provisions of the decree, pending examination by the Council of Ministers of new proposals for the regulation of broadcasting.

On Feb. 2 it was announced from the Ministry of Commerce that broadcasting might go on as usual pending further orders, since it had been decided that the matter was one which the Ministry of Commerce was not competent to settle, and must be dealt with by the Council of Ministers, and subsequently by Parliament.

Some time ago it was announced that the French Government contemplated the establishment of two or three high-power stations and eighteen lower power stations, and that broadcasting would become a State monopoly. But so far these schemes have not materialised. One big difficulty is that of finding the necessary money. There is only a nominal licence fee of 1 fr. (about 2*d*.) per annum at present, and even that has been found almost impossible to collect. For their revenues the French stations depend almost entirely on advertisements.

The new direct Western Union cable connecting Paris, Havre and New York was opened to traffic on Feb. 6, being the first cable between France and the United States which does not touch land at any intermediate point, whether in England or the Azores; it is the longest existing cable between Europe and America, measuring 3,750 miles. It was kept busy all day, and short message from Paris to New York were transmitted in the record time of 30 seconds, answers being obtained in three minutes; the distance between Paris and San Francisco was covered in five minutes—presumably with a clear line throughout. In any case, these additional cable facilities do not give the appearance of submarine telegraphy as a dying industry!

GREAT BRITAIN.—The following dividends have been declared in connexion with the Anglo-American Telegraph Company, Ltd. A final dividend of £1 10*s*. per cent. on the consolidated ordinary stock, making £3 15*s*. per cent.; final dividend of £1 10*s*. on the preferred stock, making £6 per cent.; and a first and final dividend of £1 10*s*. per cent. on the deferred shares, as for 1926.

The British Broadcasting Corporation is to develop simultaneous broadcasting from several stations of a single programme and transmission to the Empire by arranging for the retransmission in this country of items originating in foreign stations, and therefore is to establish land-line contact between a number of foreign stations and 2LO; the Vienna-Thanet cable has proved a satisfactory medium. It is understood, says the *Electrical Review*, that immediate co-operation is forthcoming abroad, and that the Union Internationale de Radiophonie has long fostered the idea of an exchange of programmes between different countries.

The Empire Conference on Empire Communications which the Postmaster-General announced in the House of Commons on Dec. 19, had been called by Great Britain, began on Jan. 16, and, according the *The Times*, was attended by the following:—

Great Britain.—Sir John Gilmour, M.P., Secretary of State for Scotland (chairman) and Mr. A. M. Samuel, M.P., Financial Secretary to the Treasury.

Canada.—Sir Campbell Stuart, Canadian representative on the Pacific Cable Board, with Mr. L. J. Gadoury, Deputy Postmaster-General for Canada, and Commander Edwards, Director of Canadian Radio Services, as his advisers.

Australia.—Mr. Clive Baillieu, with Mr. H. P. Brown, Director-General of Posts and Telegraphs, as his adviser.

New Zealand.—Sir James Parr, High Commissioner, with Mr. Milward as his adviser.

South Africa.—Mr. H. J. Lenton, Postmaster-General.

Irish Free State.—Mr. R. J. Cremins.

India.—Sir Atol Chatterjee with Mr. M. G. Simpson and Mr. P. J. Edmonds, as advisers.

Crown Colonies.—Sir Samuel Wilson, Permanent Under-Secretary of State for the Colonies.

Secretariat.—Secretary to Conference, Sir Norman Leslie (Committee of Imperial Defence). Asst. Secretaries: Mr. C. R. Price (Dominions Office) and Mr. H. G. G. Welch (G.P.O.).

Television, the unique monthly organ of the Television Society of England, Number One of which was issued this month, is a very safe indication that the newest science is coming into its own. Added to this may be cited the fact that component parts of the Baird apparatus are actually on sale at one of the largest of London's stores!

Telephone and Telegraph Services.—The Post Office's commercial accounts for the year ended Mar. 31, 1927, show that the surplus on the telephone service reached £283,375, against £550,830 in the previous year. The deficit on the telegraph service was £1,349,112, approximately £50,000 more than in 1925-26. The income from telegraph business was £4,777,295, a decrease of £61,582, and that from telephone business was £17,302,674, an increase of £1,365,123. The expenditure on both services amounted to £912,894, an

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increase of £28,290, while depreciation thereon reached £4,664,225, some £525,692 more than in the previous year.

A correspondent of *The Times Engineering Supplement* in Geneva reports that in connexion with the advance of wireless in Switzerland, about 5,000 licences have been granted at Geneva, 6,000 at Lausanne, 16,000 at Berne, 32,000 at Zurich, and 3,000 at Basle. This development is likely to create a demand for large numbers of imported sets and accessories. British manufacturers should be able to profit accordingly.

HOLLAND.—Messrs. Philips Lamps, Ltd., announce that their short-wave station (PCJJ), recently rebuilt, is now transmitting every Tuesday and Thursday, from 18-21 hours, G.M.T., on a wavelength of 30.2 metres, as before.

This statement confirms the information given in these columns last month.

ICELAND.—Test transmissions started recently on a wavelength of 192 metres from a station erected at Akureyri, on the north coast of Iceland, by Mr. F. L. Hogg, a London engineer. The station has been subscribed for in this country and in the U.S.A., and is under the control of a representative of the Christian Missions In Many Lands. There is also a station at Reykjavik, the capital of Iceland. The new station's call signs are NI (North Iceland) and G2SH.

INDIA.—With reference to the "piracy" trouble in India, Reuter's Bombay Agency reports as follows:—

"The unsatisfactory financial position of broadcasting in India, which has aroused comment with regard to the extent to which "piracy" is being practised, is ascribed in the latest issue of the Broadcasting Company's organ to the Government's attitude towards "piracy" and also to its omission to take steps to enforce the laws regarding receiving licences. In this connexion the Posts and Telegraphs Department has recently inaugurated strict supervision of sets in Bombay City, which has revealed that a large percentage of listeners have no licences. While the authorities are reticent, it is understood that steps are being taken to ensure that all listeners in future shall take out licences. A commentary on this is furnished by the fact that over 600 applications for licences were received during three weeks in Bombay City alone, compared with fewer than 2,000 for the whole of British India to the end of October. It is believed that listeners up country are equally lax, and it is urged that dealers should insist on the production of a licence before selling a set.

ITALY.—The submarine telegraph cable of the Compagnia Italiana dei Vavi Telegrafici Sottomarini connecting Rome, Malaga, Las Palmas, St. Vincent, Rio de Janeiro, Montevideo and Buenos Aires, which was opened on Oct. 12, 1925, has recently been augmented by two new sections—a Rome to Barcelona cable and a Barcelona to Malaga cable.

A Royal Decree published in December last, says the *Electrical Review*, creates a new situation and reflects the decisions of the Commission for the Control and Development of the Broadcasting Service, which was appointed in January last year.

According to *World Radio*, the Unione Radiofonica Italiana, which has carried on the service since its beginning in 1924, has been converted into the "Ente Italiano per le Audizioni Radiofoniche" (E.I.A.R.), to whom the service has been exclusively entrusted, for the period of twenty-five years commencing Dec. 15, 1927.

The following items in the new arrangements are selected as likely to prove most interesting:—

The Unione Radiofonica Italiana (U.R.I.) undertakes to transform its organisation and to increase its present capital from lire 6,200,000 to lire 8,200,000. The new shares are being offered to the present shareholders and the wireless industry, to the wireless and electrical trades, to the Society of Authors, theatre proprietors, the Press, musical editors, and to radio listeners. Until Dec. 15, 1928, the capital of the company will have to be increased to lire 10,000,000. With a view to ensuring the Italian nationality of the new body, the shares are nominal, and they will be negotiable in Italy only. The ordinary revenue of the company will consist of the subscription fees and 90% of the taxes on sets and materials, the remaining 10% being for the benefit of the State. The Superior Committee of Supervision will be attached to the Ministry of Communication (Director-General of Posts and Telegraphs); it will consist of sixteen members (including the chairman), drawn from the trade, industrial, intellectual and juridicial circles, and will be all appointed by the Prime Minister. Special committees of supervision will be established in the Italian Mediterranean possessions, to which the decree is extended. Contrary to expectations, taxes on certain materials have not been abolished, but only partly modified, and new ones have been created. The tax of lire 6 on each valve (whether new or regenerated) remains, as does the tax of lire 12 on each crystal set, and lire 24 on each loudspeaker (even when built in the set); the tax of lire 36 on each valve set (not including the tax on the valves) has been abolished and instead of it an *ad valorem* tax of 2% on each valve set has been imposed, with a minimum of lire 30 (not including the tax on the valves). New taxes concern: headphones, lire 3 (single), lire 6 (double); variable condensers, lire 6; h.f. or l.f. transformers, lire 6; and multiple valves, lire 6; as many times as valves are contained in the multiple valve. For the purpose of controlling the payment of taxes by the public, radio dealers are compelled to keep inventory books, in which entries have to be made of the materials acquired and sold. The annual subscription fee to the broadcasting service has been reduced from lire 96 net to lire 72 net (with possibility of payment in monthly instalments). Schools, educational bodies, &c., are exempt from the obligation of subscription, as are military hospitals and military homes. The above-named subscription is, however, for particular persons only, and compulsory subscription will be applied to administrations of towns, with a minimum population of 1,000 inhabitants (lire 50 a year), there being fourteen categories between the minimum and the maximum. Another class taxed with the compulsory subscription comprises the hotels, thermal and hydrotherapic establishments, watering places, picture houses, kursaals, educational, cultural or sporting clubs, and associations, the fees varying from a maximum of lire 1,500 per annum (*de luxe* hotels), the group being divided into sixteen categories. The scheme foresees the substitution of the existing Rome station and the building of several new stations, to be opened in 1928, 1929, and 1930, respectively.

The *Daily News* Rome correspondent wires to the effect that an invention by Signor Manrico for ensuring the secrecy of wireless communications has been taken over by the Italian Government in "the interests of national defence" by a decree dated during the month of January last.

Naturally there is considerable reserve maintained as to the details of the invention, continues the correspondent, but it is stated to be based chiefly on a system of telegraphy and radio-telegraphy in combination with a special typewriter.

It is understood that the invention is based on the possibility of direct Hertzian waves at will which suggests some form of beam system.

Signor Compare was in London for some time, and has been experimenting also in Berlin. He has made recent experiments in the presence of the Italian Under-Secretary for War, Signor Cavalrelo.

MEMO.—There have been several systems of this species mooted during the last few years, especially the use of a permuting typewriter keyboard.—[*Ed., T. & T. Jl.*]

NORWAY.—The *Central News*, cabling recently from Oslo, asserts that Lars Christensen, who sent out the Norvegia expedition which occupied Bouvet Island in the icy wastes of the South Atlantic, and hoisted the Norwegian flag there on Dec. 1, has taken steps to erect a wireless meteorological station on the island.

The occupation of Bouvet Island by the expedition led to a curious dispute between the British and Norwegian Governments, both of which claimed possession, but there should be no dispute as to the value and importance of erecting a wireless station on the island. If conditions permit the station will work all the year round, and will thereby be able to give vital weather forecasts to South Africa, South America, and all navigation in that part of the Antarctic. Lars Christensen will cover all the cost of erection and the running of the station.

The Norwegian Broadcasting Company announces the paying number of listeners to have been 61,848 in December, 1927.

NORTHERN IRELAND.—The Western Union Telegraph Co. opened a new office in Belfast on Jan. 26, thus inaugurating a direct cable telegraph service between that city and New York.

PALESTINE.—The laying of a new cable to link Palestine with the submarine telegraph system of the world has been completed for traffic by the Eastern Telegraph Company. The cable connects Larnaka (Cyprus) and Haifa, and is the first submarine cable to be laid to Palestine. The Eastern Associated group is now at work on underground lines between Port Said and Suez, in order to bring about direct communication with India. By means of the "regenerator," complete automatic working is made possible, and the need for re-transmission eliminated. (See also under Cyprus.)

PERSIA.—Reuter cables from Teheran that the wireless experiments which have just been concluded between Angora (Turkey) and Teheran, having proved successful, the Ministry of Telegraphs has notified the public that messages can now be accepted for Angora by this means.

PHILIPPINES.—A wireless telegraph service between the Philippines and French Indo-China and the Kingdom of Siam was recently inaugurated by the Radio Corporation of the Philippines. Automatic transmission and reception gives direct communication between Manila and Saigon, says the *T. & T. Age*, while messages to Siam are sent via Saigon.

SOUTH AFRICA.—A chorus of praise has greeted the performance of England's short-wave Empire transmitter (5SW) at Chelmsford, says *World Radio*. Dr. J. Lunt, of Kenilworth (late member of the Royal Observatory staff, Cape Town, who was in England about a year ago), is acting as the pick-up station for the Cape Town broadcasters, and his co-operation is efficient. Signals fade after ten o'clock, although during the past month, it has been noticed that the fading hour is gradually lengthening.

Cape Town's two radio inspectors have been very busy of late: ten prosecutions have been effected during two months in the Cape Peninsula, and about twenty others are to appear before the magistrates shortly. There are very few real "pirates" (listeners who have never taken out licences), the majority having been fined £2 for failing to renew their licences within 14 days of expiry, or notifying the P.M.G. that a permit is wanted to keep the set without using it.

SWEDEN.—From Stockholm we hear, through Reuter's Trade Service, that the Swedish Government has authorised the telegraph authorities to spend kr. 5,970,000 during the next year on the extension of the telegraph and telephone systems. A sum of kr. 1,900,000 will be used for telephone cables between Stockholm and Gaefle and Norrkoeping and Linkoeping, and kr. 3,350,000 for the continued construction of automatic telephone exchanges at Stockholm and Gothenburg.

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Further information from the same source states that an expenditure of kr. 465,000 is also to be devoted to the "reinforcement" of the Gothenburg and Malmoe broadcasting stations, "during the next year," which latter term probably refers to the Swedish financial year. In any case the money appears to have been duly voted, and the following from *The Electrical Review* shows the extraordinarily successful condition of broadcasting in that country. Says the *Review*:—"Swedish broadcasting in 1927 yielded a net profit of about 600,000 Swedish kronor, against 400,000 kronor in the previous year, and there are not less than 53.6 radio sets per thousand inhabitants, according to an official report from the Royal Telegraph Administration, which claims that next comes England with 53.

"The figures for other European countries are: Denmark, 44.8, Austria 43, Germany 28.1, Norway 22.1, Switzerland 15.9, Czecho-Slovakia 15.2, Hungary 9, Finland 8.8 and Belgium 4.6. After deducting 6% interest on the capital invested by the Government in the broadcasting business, the net profit of the year means an increase of 150% since 1925."

SPAIN.—From Madrid it is cabled that the Spanish Trans-Radio Company has just been formed, with a capital of four million pesetas (about £143,000), which has been fully subscribed. This company, which has recently obtained a concession from the Spanish Government for a public international wireless service, comprises the National Spanish Wireless Company, the concessionary for all internal wireless services, which holds the rights in Spain for all Marconi patents; the Iberian A.E.G. Co., concessionary for the Telefunken Co.'s patents; and the Spanish Wireless Company, concessionary for the patents of the Compagnie Générale Francaise de T.S.F.

SWITZERLAND.—The Geneva correspondent of the London *Daily Telegraph*, writing from Geneva at the end of January (too late for publication in our last issue), says that the question of the erection of a League of Nations wireless station is still occupying the attention of an expert committee under the chairmanship of General Ferrie, Director of Military Radio-telegraphy in the French War Ministry.

The names of the full committee were given in last month's issue.

The correspondent in question makes it very clear that this wireless station would be established at the Secretariat of the League, and, in time of crisis, would enable urgent wireless communications to be carried on with the countries concerned, particularly European countries, and would at ordinary times be serviceable for the purpose of telegraphic correspondence connected with the League.

Such a wireless station would be under the entire control of the Secretariat of the League, and would be worked by officials of the League, independently of the Swiss Post Office or any other post office. The station would have a range covering at least the whole of Europe.

It would also appear to be necessary to re-emphasize the warning that this scheme for a "League" wireless station has nothing to do with any other demand, Press or public, for increased telegraph facilities between Geneva and London, which, it is understood, are receiving consideration in the appropriate quarters.

TANGIER.—A Franco-Spanish Conference has been sitting at Tangier, reports Reuter's agency, to examine the possibilities of linking Tangier up by telegraph and telephone lines with the French Moroccan zone. The lines would have to cross the Spanish zone, and two possible solutions have been worked out for submission to the two Governments: one is for a line along the Tangier-Fez road, and the other for a line on the Tangier-Rabat road via Larache.

U.S.A.—The lease of the high-power trans-oceanic radio station at Sayville, Long Island, by the Postal Telegraph Company, the Commercial Cable Company, and the newly-formed Mackay Radio Company is an important step in ship-to-shore communication to compete with the existing organisations. World-wide communication such as is planned will mean combination of cable and radio services, each supplementing, but not necessarily supplanting, the other. The transpacific radio link between San Francisco and Honolulu will be completed this summer, and by the end of the year a link will be established with the Philippines. Simultaneously the Atlantic radio service between the entire Eastern coast of America and ships will have been gradually built up, and with the completion of the Pacific wireless stations the Mackay companies with Sayville as their base will have commenced an Atlantic radio service in competition with the existing agencies, says the *Daily Telegraph*, but it is not known which countries the Commercial Cable Company intends to approach in pursuance of its scheme for a trans-atlantic wireless service. The station at Sayville, Long Island, was originally operated by the German Telefunken Company, which built it in 1912, its chief purpose being to communicate with the station at Nauen. On July 15, 1915, the U.S. Navy radio service took over the station.

The Federal Radio Commission opened its hearings on Jan. 17 on the need for long-distance broadcasting and telegraph transmission on short waves. Representatives of newspapers, press associations, telegraph companies, and the Government Department of Industries were present to claim short-wave allocations. Mr. Mackey, representative of the communication system, said it was desired during the next five years to establish short-wave point-to-point radio circuits between New York, Chicago, San Francisco, Galveston and elsewhere, co-ordinating with the present wires. The *New York Times* attorney said his newspaper desired to establish a station for Washington and the Pacific coast.

The first demonstration of broadcast radio television arranged by the Radio Corporation of America is reported to have been successfully carried out on Jan. 13, says the *Electrical Review*, before groups of engineers, scientists and newspaper men, who, standing before home television sets, saw moving images and heard voices of a man and woman transmitted from the General Electric Co.'s laboratories several miles distant. The pictures were so lifelike that smoke from a cigarette was transmitted as perfectly as on the screen. The receiving sets were installed in three different homes, and all functioned equally well. Transmission was on a 37.8-metre wave-length, while the voice was simultaneously transmitted on 379.5 metres.

The *Electrical Review* announces that the Radio Corporation of America has obtained from the Federal Radio Commission 16 licences for short-wave transatlantic communication, while three similar permits covering service to insular possessions in the Pacific have been issued to the Federal Telegraph Company, now owned by the Postal Telegraph-Cable Company. The adaptation of radio to commercial purposes through the use of short waves was considered by the Commission on Jan. 17 and 18.

Actual semi-public trials of television across the Atlantic have since been made by the Baird Television Development Company of London, with imperfect results, certainly, but sufficiently well-advanced to inspire confidence. In fact, "it was possible to see faces and hands and lips moving and to distinguish between a man and woman's face." This was one of the stages reached, it will be recalled, by Mr. Baird when working on his first experimental between the centre of London and one of its suburbs, and there appears to be little doubt that the arrival of motion pictures across the ocean is only a matter of time and that, according to Captain O. G. Hutchinson, Managing Director of the Television Company, not a very long period either. As reported by Reuter's Agency, the Captain announced that a two-way public television service between London and New York would be opened before the end of the year.

He said that a televisor similar to that used in his recent test was being completed and would be installed at some convenient point on Long Island, whence it would be connected to a transmitting station in New York.

An interesting article in the *T. & T. Age* explains, *inter alia*, that in 1920 the Institute of Radio Engineers and manufacturers co-operated with the National Fire Protection Association in working out rules governing radio installations. Rule 37 of the Code applies specifically to radio, and at the 1927 annual meeting of the Association the Article Committee on Rule 37 made some recommendations for changes probably to appear in the next edition of the Code, which is divided into two parts: one governs mainly the construction and mechanical support of the antenna, the earth (or counterpoise system) and protection of the system from heavy static accumulation and discharge due to lightning; the second part has to do with transmitting installations.

Six years' experience has led members of the Code Committee to believe that the addition of an earthing switch contributes nothing of advantage in the way of protection; in those cases of the switch having served to prevent damage, in most instances it was apparent that the arrestor employed was not of good design, was too small in dimensions, or was not constant and dependable in action. Arrestors are intended to discharge from line to ground any foreign current due to a potential exceeding the breakdown of the arrestor, say, 400 volts. The insulation resistance between the line and ground terminals, with d.c. of not less than 100 volts, should be not less than 100 megohms when dry and not under 10 megohms under service conditions, out of doors. A serious hazard is that the antenna may fall or swing into contact with high-voltage power wires; indeed, already much of the damage done has been due to just such happenings.

The Post Office Relief Fund quietly continues its good work and expended no less a sum than £36,000 during the past twelve months.

Inaugurated in 1914 it made itself responsible for all cases of need arising amongst the dependents of P.O. men called to the colours.

By 1919 over £440,000 was collected which made it possible for every P.O. case to receive assistance without going to any other fund and by so much relieving the financial strain elsewhere.

The total amount disbursed since 1914 amounts to £412,000, mainly in giving assistance to the 3,200 widows, 5,700 orphans and 1,500 other dependents of those who had lost their lives, numbering in all over nine thousand men.

At the present moment £15,000 annually is being spent on grants to widows and £20,000 per annum on secondary and technical education.

The expenditure is so framed that the Fund should become exhausted at the moment its liabilities cease. Three years ago it was feared that the assets might not be sufficient to carry through the work. A special appeal to the staff resulted in the collection of a further £15,600 and the position is now satisfactory. Practically all the work is voluntary and has been shared by every rank in the Department.

If any excuse were necessary for giving the above *resumé* of this amazing result of co-ordinating effort, it is to be found in the fact that so unostentatiously is the work carried on that there are actually scores of the post-war young men and women of the service who are unaware of what has been and is still being done.

That potent force in this organisation in its early stages, Mr. Arthur G. Ferard, of the Secretary's Office, since retired, must indeed look back with satisfaction at the way in which his many lieutenants of all grades throughout the country carried on the good work.

The C.T.O. 1927 collection for the Hospital Saturday and Sanatoria Funds amounted to £280.

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The C.T.O. Benevolent Fund, however, needs more members in order to keep up its prestige in the Orphanage and other benevolent circles.

For "Draper" please read "Diaper" in the C.T.O. Inland promotions paragraph of last month's Memorabilia—and with apologies!

Further promotions in this department are the following: Mr. E. S. Pratt, Overseer, to Assistant Superintendent, and Messrs. C. C. Norris, W. H. Ward and W. R. Smith to the rank of Overseer, to whom sincere felicitations.

There is quite a galaxy of Cable Room names in front of me as having received appointments of a "provisional" nature, and all that one can do is to proffer the heartiest hopes that each "Provisional" will soon become "Substantive." The conditions in the Overseas Telegraphs must surely be absolutely without precedent, especially when one hears of three score and more recruits marching Londonward from the Provinces!

Since writing the preceding paragraph one notes with extreme satisfaction the confirmation of both Mr. F. A. Sleat's appointment as Asst. Supt., and that of Mr. A. M. Pearson as Overseer, on the Cable Room Establishment.

It is meet to record in these columns the much-regretted death of Professor H. A. Lorentz, F.R.S., which took place on the 4th ult. Born at Arnheim, Holland, in 1853, he took the degree of Doctor of Philosophy at Leyden in 1875 and has occupied the Chair of Mathematical Physics at the University of Leyden for nearly half a century.

Lorentz developed the electro-magnetic theory of light and laid the foundation upon which Einstein raised the theory of relativity. It was Lorentz who discovered that sun-spots were electric cyclones.

Telegraphic Optimism.—Sooner or later the telegraphs, and *not* the mails, will be the usual long-distance channel for but the most trivial communications.—The Empire Press Union.

J. J. T.

TELEPHONE PROGRESS REPORTS, 1927.

WE have received copies of the Annual Progress Reports for several districts. We regret that space does not permit us to publish more than the following brief extracts from these interesting documents:—

LONDON.

The outstanding events in the past year have been the opening of the first public automatic exchange in the inner London area and the establishment of a mechanical tandem junction exchange in connexion therewith; the inauguration of wireless telephone services to the United States and Canada; development of the telephone services to European countries, and the opening of an additional exchange to improve telephone communication between towns in the area served by the Toll Exchange. These items are referred to in more detail later in this report.

Holborn automatic exchange, which will ultimately accommodate 9,400 lines, was opened on Nov. 12, 1927, with the transfer of 4,820 lines from the Holborn manual exchange.

It will shortly have 500 lines transferred to it from other exchanges.

There are a number of novel features incorporated in the design of this exchange which have caused its erection and opening to be watched with great interest by the whole telephone world. One of the most important features is a piece of apparatus known as a "Director" which performs a number of functions, one of which is to direct telephone calls along various predetermined channels. From time to time it is necessary to vary these channels in order to improve the service and the "Director" may be set so as to comply with the varied requirements. The automatic apparatus will receive a call from a subscriber, select the required exchange, find a disengaged junction line to that exchange, test the called subscriber's line to ascertain if it is free, send out ringing current to the subscriber and transmit various signals to the calling subscriber, one of which indicates that the wanted subscriber is being rung, another that he is already engaged, or another that for some reason the subscriber is unobtainable.

The operations to be performed by subscribers on an automatic exchange when making a call differ from those required of subscribers on a manual exchange. In order to show subscribers the new methods, literature has been issued and visits paid to subscribers' premises. Notwithstanding these measures, many subscribers failed to appreciate the requirements at first, and this fact, coupled with the large number of calls out of curiosity during the first few days after the opening, threw a great strain upon the equipment and caused congestion. The subscribers are now getting accustomed to the new methods and the apparatus is performing its normal functions in a very satisfactory manner.

There are now 118 exchanges in the London Area (including Trunk, Tandem and Toll exchanges) as compared with 112 last year.

The number of exchange lines at the end of 1926 was 298,766. At the end of 1927 the number was 327,043, the net increase for the year being 28,277, or about 9.5%.

The proportion of residence lines is increasing considerably, and it is evident that the advantages of the telephone to suburban users are being more fully appreciated.

Private wires, which connect subscribers' offices without passing through a public exchange, now total 15,123.

The total number of telephones—exchange and private—at the end of 1925 was 519,969, and at the end of 1927 the number was 565,590. The rate of increase was thus about 8.8%.

The total number of manually operated private branch exchanges now installed in the London area is 24,250; an increase of 1,280 during the past year. There are also 121 private branch exchanges of the automatic type, as compared with 97 at the end of 1926.

The Department supplies telephonists where desired to staff private branch exchanges in subscribers' offices.

An appreciable amount of work is involved in the large number of removals from one address to another, and alterations to apparatus at the request of subscribers which are effected every year. Approximately 34,330 such cases were dealt with during the past year.

The number of call offices working at the end of 1926 was 4,686. At the end of 1927, the number was 5,076, the increase for the year being 390.

The number of kiosks open at the end of the year was 755. These kiosks provide day and night service.

The opening of Holborn exchange has already been mentioned. It is anticipated that early in 1928 Bishopsgate and Sloane automatic exchanges will be opened, to be followed during the year or early in 1929 by Western, Monument, Bermondsey, Maida Vale, Temple Bar, Langham and Edgware. Up to the present, 24 specifications have been issued covering the initial equipment for 133,000 exchange lines. The exchanges concerned will ultimately accommodate over 175,000 lines.

In addition, equipment studies for the purpose of specifications have been completed for 15 exchanges with a total capacity for over 58,000 lines initially, and 116,000 ultimately. Preliminary details have been settled for a further 34 exchanges.

In all, 73 exchanges are thus concerned, involving the ultimate provision for over half a million telephone subscribers.

LIVERPOOL AND DISTRICT.

New manual exchanges of the latest type have been provided at Huyton and Maghull, and new exchanges which are now under construction at Garston and Stockton Heath will be ready for service early this year. A site has been acquired for a new exchange building at Neston and a telephone exchange will also be opened shortly in connexion with a new exchange area to be formed at Norcott Brook, Cheshire.

A considerable extension has been made to the equipment at Wallasey, and equipments at Helsby, Rainford, Golborne and many other exchanges have been improved and increased. Additional equipment has been installed at Prescot, and arrangements have been made for providing additional equipment at St. Helens to meet requirements until the conversion to automatic working takes place in 1930.

During the year ended Sept. 30, 1927, 7,390 new telephones were fitted. After allowing for cessations this shows a net increase of 4,004, or approximately 6½%. The number of telephones increased from 34,910 in September, 1912, to 65,638 in September, 1927—a growth of 88% in 15 years.

The provision of additional underground cables to meet the demand for new subscribers' circuits is a continuous process and new services can be given within one or two weeks from the date of the order to proceed. Occasionally an isolated case of delay may arise, but happily these cases are rare, and can usually be attributed to causes which could not be foreseen.

In addition to the large number of cables which have been provided during the year for new subscribers' circuits, new main cables have been brought into use between Liverpool and Bootle, Waterloo, Crosby, Hightown, Formby, Old Swan and Huyton. New cables are to be provided in 1928 to Manchester, Huddersfield, Leeds, Colwyn Bay and Rhyl.

Several additional long-distance circuits from Liverpool and the surrounding areas to London and other important centres have been brought into use during the year by means of the various repeater stations associated with the main underground cable routes. Arrangements are in hand for providing telephone repeater apparatus at the Liverpool H.P.O. which will result in further improvements in the transmission on long-distance calls from the subscribers in the Liverpool district.

MANCHESTER AND DISTRICT.

During the twelve months ended December, 1927, the number of new telephones fitted is 9,162. After allowing for cessations 4,852 new stations were added, an increase of 6.23% on the December, 1926, figure. The number of telephones has increased from 32,946 in September, 1912, to 82,575 at December, 1927, a growth of 151% in 15 years.

The number of effective trunk calls and telegrams for the year ended December, 1927, is 6,218,106, being an increase of nearly 400,000 over the

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corresponding period last year. The local calls for the year ended September, 1927 (the latest figure available), is approximately 61,000,000, an increase of 4,000,000 over the previous year.

Progress on the new telephone building in Chapel Street during the past year has been satisfactory and it is anticipated that it will be ready in October, 1928, for the installation of the advance manual switchboards required in connexion with the opening of the Ardwick, Collyhurst and Moss Side automatic exchanges. This equipment will take approximately 12 months to instal. The new exchange buildings for the Ardwick, Collyhurst and Moss Side areas, which will be the first in the Manchester area to be converted to automatic working, are also progressing satisfactorily and it is expected that they will be ready for the installation of the equipment by March, 1928. The present plans provide for the opening of the first unit of 10,000 lines, to be known as "Blackfriars," in the Chapel Street building in 1931. The conversion to automatic of many other parts of the Manchester area is also expected to be completed early in 1931. A considerable amount of underground work involving the laying of blocks of conduits or ducts, for the accommodation of cables has been necessary in connexion with the Manchester conversion scheme, and 120 miles of single duct have already been laid. Additional work at present in hand involves a further 100 miles of single duct and these include large nests along Deansgate (44 miles), Sackville Street (40 miles), and Pinmill Brow (16 miles).

A new exchange has been opened at Stalybridge, and extensions of existing equipment have been provided at 21 exchanges, including Wilmslow, Eccles, Bramhall, Heaton Moor, Pendleton and Rusholme. The supplementary equipment at Oldham is being increased to accommodate 840 additional lines.

During 1928 new exchange installations or extensions to existing equipment will be carried out at Disley, Irlam, Marple, Trafford Park, Stockport, Middleton, Chorlton, Sale, Leigh, Buxton and other exchanges. The automatic installation at Shaw will be opened early in 1928.

Schemes are in preparation for the provision of additional cables between Manchester and Rochdale, Ashton, Middleton, Heaton Moor, Macclesfield, Chinley, Preston, Chester, Stockport, Buxton, Liverpool and Leeds.

WEST YORKS DISTRICT.

During the year ended Dec. 31, 1927, a steady increase in the number of lines and stations has been maintained, the figures being as follows:—

	Lines.	*Stations.*
At Dec. 31, 1926	38,667	59,197
Added during 1927	5,055	7,972
At Dec. 31, 1927	40,817	62,483
Net gain (after allowing for cessations)	5.5%	5.5%
Trunk calls		5,615,929
Local and Junction Calls		38,456,222

There has been a marked increase during the year in the use made by subscribers of the facilities for telephoning telegrams from office or house to the Post Office.

Telegrams so passed by subscribers	1927 ...	430,325
	1926 ...	388,825
	Increase ...	10.6%

The time save by telephoning a telegram is appreciable and obvious.

During the year just concluded exchanges at several important towns in the West Yorkshire District have been transferred to more commodious premises either specially built or adapted. The towns concerned are Brighouse, Shipley, Dudley Hill, Low Moor, Halifax and Wakefield. At the two latter, the automatic system similar to that in operation at Leeds has been installed whilst at the remainder of the towns named central battery equipment has been provided. In connexion with the Wakefield automatic exchange a satellite exchange has been opened at Sandal, and another will be opened in the near future at Lofthouse Gate.

At Keighley, Armley and Hipperholme new buildings have been specially designed for the accommodation of automatic telephone equipment, the installation of which is already in progress.

At Sowerby Bridge the manual exchange will be converted to the automatic system in a few months time.

Additional exchanges at Aberford, Oakwood (Roundhay) and Kirkburton have been approved, and proposals are under consideration for exchanges to be installed at Kippax, Hunslet, Middleton and Adel, and for the transfer of existing exchanges to more suitable premises at Ossett, Morley and Rawdon. Of these exchanges, Oakwood, Middleton, Hunslet and Adel will be worked on the automatic system.

In the Bradford local telephone area negotiations are in hand for the acquisition of sites upon which to erect buildings for new automatic exchanges at Manningham, Great Horton, Laisterdyke and Undercliffe. It will be some time before these exchanges can be brought into use but when available they will not only relieve the present Bradford C.B. exchange, but also form a nucleus for the conversion of the Bradford telephone area to automatic working.

The development of the Leeds authomatic exchange, both as regards the steady increase of subscribers' lines and junction circuits, has made additional accommodation essential and this is being provided.

A BRIEF CHRONOLOGY FOR STUDENTS OF TELEGRAPHS, TELEPHONES AND POSTS.

BY HARRY G. SELLARS.

(*Continued from page* 106.)

1835 ... ... Steinheil produced a magneto-electric machine, and improved the telegraph of Gauss and Weber. His receiving apparatus in response to positive or negative currents produced dots on moving paper strips, or sounds on two bells of different tones. Steinheil may be said to be the father of printing and acoustic telegraphs.

James Henry Leigh Hunt, referring to the Admiralty telegraph, said: "Where the poor Archbishop sank down in horror at the sight of King Charles's execution, telegraphs now ply their dumb and far-seen discourses, like spirits in the guise of mechanism, and tell news of the spread of liberty and knowledge all over the world."

London divided into ten postal districts, each with a "Surveyor" in charge.

Death penalty for stealing letters abolished.

Rates of postage, London to York, 11*d.*; to Edinburgh, 13*d.*; to Dublin, 16*d.*; to Gibraltar, 34*d.*; to New York, 26*d.*; to Madrid, 23*d.*; to Rio de Janeiro, 32*d.*

1836, March ... Cooke, at Heidelberg, saw a pair of needles fitted up for signalling in the manner suggested by Ampere and Laplace.

1836, June 10 ... André Marie Ampère died.

De la Rue observed that copper deposited on the copper plate of a Daniell cell took the exact impression of the plate. He also produced a chloride of silver battery.

Cooke showed Faraday a needle apparatus he had constructed for exhibition to the directors of the Liverpool and Manchester Railway. He used three line wires, three needles, and an alphabet formed by alternate currents.

British Government allowed newspapers to pass free of charge through local penny posts.

Daniell devised a battery made up of copper, zinc, sulphate of copper and sulphuric acid.

Stamp duty on newspapers reduced to one penny.

Mr. Stow died, and, no new partners having been allowed to enter the Money Order Office business, Mr. Watts remained sole proprietor with a capital of £2,000.

Number of Money Orders issued—55,000.

1837, Jan. ... Packet Services transferred from the Post Office to the Admiralty.

1837, June 10 ... Cooke and Wheatstone patented a five-needle telegraph for which five wires were necessary.

1837, July 3 ... Mail carried from London to Birmingham by coach and thence by rail to Liverpool and Manchester.

1837, July 12 ... Act passed empowering the Postmaster-General to charge for registration of letters provided Post Office had no liability in cases of loss.

Professor Wheatstone proposed laying a cable from Dover to Calais to be worked by the needle apparatus introduced by Cooke and himself.

1837, July 25 ... Wheatstone, Cooke, Brunel and Stephenson proved the practicability of the five-needle telegraph by experiment between Euston and Camden Town on the London and Birmingham Railway.

Pouillet improved upon Schweigger's galvanometer and invented the "Sine" and "Tangent" galvanometers. Used as a standard the resistance of a measured column of mercury.

Charles J. Page, of Salem, Massachusetts, discovered that a faint click is heard when a bar of steel is magnetised or demagnetised. By rapid magnetisation and demagnetisation he obtained sounds which he called "galvanic music," and showed that the production of sound by electricity was possible by the transmission of currents in rapid succession [illegible] electro-

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1837, Sept. ... Morse, assisted by Gale and Alfred Vail, produced and exhibited in New York a telegraphic recording apparatus which indented marks of varying length on paper tape in response to electrical impulses received from a distance.

Brothers Highton devised a single needle telegraph apparatus and a key with two tappers which was used extensively by the Post Office.

Prof. Whewell defined "polarity" as "opposite properties in opposite directions, so exactly equal as to be capable of neutralising one another."

Faraday, unaware of Cavendish's researches, discovered specific inductive capacity, and measured its value in various substances. He also demonstrated with his "Ice Pail" that an induced charge is equal to the direct charge produced by contact with the inducing body, and coined the word "dielectric."

Volpicelli showed that vibrations produced electrification.

Erman drew up a list of metals which could be electrified by percussion.

Peclet found that the degree of electrification depended on the materials rubbed together and the velocity of movement.

Glover calculated the electrical resistance of various metals.

Bosanquet calculated the magnetic permeability of various metals.

Archibald Smith fixed the magnetic susceptibility of iron at 80 to 90 units.

Stoletow fixed the magnetic susceptibility of iron at 21 to 174 units.

Thalen fixed the magnetic susceptibility of iron at 32 to 44 units.

Forbes found that the resistance of iron increased if its temperature is raised.

Cumming discovered that the thermo-electric properties of iron and other metals were inverted when the circuit was heated above a certain temperature.

Kinnersley invented the Electric Air Thermometer to investigate the heating powers of an electric discharge.

Favre conducted experiments on the relation of the energy of an electric current to the heat it develops.

1837, Oct. ... London Electrical Society formed. President, William Sturgeon; Treasurer, John Peter Gassiot.

Johann Philipp Wagner invented the electro-magnetic hammer.

First steamer ("William Fawcett") employed in carrying mails to Spain and Portugal.

Rowland Hill published a pamphlet advocating postage at the rate of one penny for half an ounce. Messrs. Warburton and Wallace, members of the House of Commons, supported the proposal strongly.

Overland Mail Service to India established, Thomas Waghorn taking the mails across Egypt.

Postmaster-General empowered to hand letter bags to Masters of outward bound vessels who were bound to receive and deliver them.

Money Orders for Great Britain printed on large forms similar to those introduced for Ireland in 1827.

Rowland Hill suggested the use of adhesive postage stamps, and stamped covers. William Mulready, R.A., designed the earliest form of stamped envelopes. Adhesive stamps were issued in sheets which had to be divided by means of scissors.

Average postage on inland letters estimated at 8¾*d*. Postage between London and Edinburgh 1*s*. 1*d*. for a single sheet.

1838, Jan. 6 ... A sorting carriage (an adapted horse-box) ran experimentally between Birmingham and Liverpool. (Frederick Karstadt, son of a Post Office Surveyor, first suggested Travelling Post Offices.)

1838, Jan. ... Commissioners of the Post Office Enquiry recommended the establishment of a letter registration system with a fee of 2*d*. and a liability limit of £5.

1838, Mar. 31 ... Steamship "Sirius" left England for America with mails.

1838, June 19 ... Decided to make the Travelling Post Office a permanent institution.

1838, July ... Steinheil discovered accidentally that only one wire was necessary to effect communication, the earth being used to complete the circuit. He tried to use the railway lines between Nuremberg and Fürth as a telegraph circuit but failed to insulate them efficiently.

Cooke and Wheatstone installed the telegraph between Paddington and West Drayton and took out a patent for laying telegraph wires formed into a cable in iron piping.

1838, July ... Edward Davy, of London, invented a relay or, as he named it, the "Electrical Renewer," in which two needles responding to negative and positive currents, respectively, brought batteries into circuit and re-transmitted the signal. Davy also devised a "Chemical Recording Telegraph" in which the incoming signal caused a metallic point to come into contact with a strip of calico passing over a revolving copper cylinder. The calico being impregnated with Iodide of Potassium and Chloride of Lime, the received current set up chemical decomposition and a permanent mark was recorded.

(To be continued.)

PROMOTION OF MR. RODGER TO DISTRICT MANAGERSHIP, BELFAST.

AT a meeting of the West Yorkshire District Discussion Circle the opportunity was taken by the telephone staff and associated departments in the West Yorkshire District on Tuesday, December 20 last, to congratulate our Traffic Superintendent on his promotion to the rank of District Manager, Belfast. Mr. Rodger came to Leeds from Glasgow at the transfer, and during his stay took a leading part in social as well as official affairs.

Under his auspices the West Yorkshire Telephone Benevolent Fund and the West Yorkshire Telephones Discussion, Recreation and Social Circle were successfully launched. The fund created by the Benevolent Fund has done invaluable work to necessitous telephone and engineering officers both established and unestablished in the district, and much of the credit for its success is due to Mr. Rodger.

A presentation to Mr. and Mrs. Rodger on behalf of the officers of the West Yorkshire District, in the form of a cabinet gramophone, was made by the Postmaster-Surveyor (Mr. W. H. Hancock).

Mr. T. A. Bates (District Manager), who opened the proceedings was ably supported by Messrs. T. B. Johnson (Supt. Engineer), G. S. Wallace (Asst. Supt. Engineer). Messrs. Lawrence, Tate, Moseley (Exchange Supt. Leeds), and Midgley (Asst. Postmaster, Bradford) also spoke.

Amongst the large and representative gathering were Messrs. E. Francis, Sectional Engineer, F. C. Winter, Head Postmaster, Wakefield, A. Cameron, Head Postmaster, Keighley, and J. F. Hunter, Supt. Survey Branch.

After the presentation a short entertainment was given by the "Hello Girls," supported by Mr. G. McElvie who related a number of North Country jokes. The remainder of the evening was spent in dancing and in listening to short demonstrations on the gramophone.

PITMANS' DICTIONARY OF INDUSTRIAL ADMINISTRATION.

WE have received an advance copy of part I of this work which will be completed in about 30 fortnightly parts at 1*s*. 3*d*. monthly. It is a kind of encyclopaedia which will cover almost entirely new grounds, and contain articles of a constructive nature by experts on the varied problems which confront industry. Amongst the contents of the first number we notice articles on Accidents, Addressing, Administration, Advances to Industry, Apprenticeship, Benevolent Funds, Bonus Payments, which, perhaps, will give a good idea of the wide scope of the work. The Editor is Mr. John Lee, C.B.E., M.A., M.Com.Sc., who hardly needs any introduction to our readers. The distinguished list of contributors is too long to quote, but in it we notice the names of many Post Office men, such as Sir Henry Bunbury, Mr. G. F. Mansbridge, Dr. H. H. Bashford, Mr. C. M. Macdermott, Mr. G. T. Archibald, and Mr. J. J. Tyrrell.

We wish the venture the success which we feel sure it will obtain.

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PROGRESS OF THE TELEPHONE SYSTEM.

THE following gives a brief review of the growth in the telephone system during the year 1927.

The total number of stations working in the Post Office system at Dec. 31, 1927, was 1,598,174 representing an increase of 121,174, or 8.2%, for the year. The figures for London, England and Wales (excluding London), Scotland and Northern Ireland separately are as follows :—

	Total No. of Stations. At Dec. 31, 1926.	At Dec. 31, 1927.	Increase.	Increase. %.
London	519,969	565,590	45,621	8.8
England and Wales (excluding London)	800,016	865,634	65,618	8.2
Scotland	137,949	146,751	8,802	6.4
Northern Ireland	19,066	20,199	1,133	5.9

Residence rate installations at the end of December numbered 127,721 in London and 205,206 in the Provinces, the total, 332,927, representing an increase of 41,227, or 14.1%, for the year. The net increase in business exchange installations for the same period was 30,824, or 5.4%. At Dec. 31, 1927, the residence rate subscribers represented 35.6% of the total exchange subscribers.

The total number of call offices working at Dec. 31 last was 23,503, of which 5,069 were connected with London exchanges and 18,434 with Provincial exchanges. The increase for the year was 2,010, of which 1,480, or 74%, were Kiosk call offices. Kiosk call offices in the London telephone area numbered 733, and in the Provincial districts 3,463, as compared with 418 and 2,298 a year ago.

During the year 1927, 124 new rural exchanges were opened under the Rural Development Scheme of 1922, bringing the total number opened under the scheme up to 1,115. In addition, a further 46 exchanges were under construction at the end of the year.

The total number of exchanges working at Dec. 31, 1927, was 4,277, of which 2,810 serve rural areas.

Rural party line stations numbered 10,174, the net increase in 1927 being 216, or 2.2%. With the increased provision of exchanges in rural areas, the net demand for rural party line service is diminishing, owing to transfers to exclusive lines to the new rural exchanges.

The number of railway stations in rural areas connected with the telephone exchange system at Dec. 31, 1927, was 854, representing 923 telephone stations. The rural railway station circuits added during 1927 numbered 133, of which 115 were call office circuits with special facilities for inward calls to the railway company's officials.

The number of effective calls originated during 1927 is estimated at 1,151 millions, representing an increase of 79 millions, or 7.4% over the total for 1926.

At the time of going to press, complete results for 1927 in respect of trunk calls were not available ; but for the 12 months ended Nov. 30 the number of inland calls was 99,286,784, an increase of 7,201,285, or 7.8%, over the total for the corresponding period of the previous year. For the same period the number of outgoing international calls was 317,925, compared with 258,076 in the 12 months ended Nov. 30, 1926, an increase of 59,849, or 23%.

Further progress was made during the month of January with the development of the local exchange system. New exchanges opened included the following :—

PROVINCES—Lewes, Nottingham (automatic).

And among the more important exchanges extended were :—

LONDON—Epsom, Maryland, Sloane.

PROVINCES—Bangor, Boxmoor, Formby, Gt. Yarmouth, Higher Broughton, Hinckley, Knock, Maryhill, Mossley Hill, Nuneaton, Parkstone, Rhyl, St. Albans, Salisbury, Southampton (automatic), Sunbury, Whitefield, Whitstable.

During the month 70 new overhead trunk circuits were completed, and 76 additional circuits were provided by means of spare wires in underground cables.

WORLD-WIDE RADIO VIA RUGBY.

THE following is a copy with names omitted of an interesting report by the Traffic Branch of the Marconi Company. It speaks for itself.

During the course of the month I have handled six important radios for . . . . Company, and in each case the shipowners have expressed to me their satisfaction of the excellent service given. In regard to item (5) they think we really excelled ourselves, and I understand the receipt of such an early reply caused quite a stir in their office, and many very complimentary remarks were passed.

(1) 10/11/27 p.m. Message for s.s. . . . . *re* clearing tanks prior to dry-docking at San Pedro ; ship then probably 1,000 miles West of Peruvian Coast, bound San Pedro. [Message sent via Rugby—reply received via Talcahuana, Sunday 13th.]

(2) 10/11/27 p.m. Message for s.s. . . . . directing ship from Curacao to Tampico ; ship then 6 days out from Falmouth. [Message sent via Rugby—reply received next day via Pennland and Devizes.]

(3) 16/11/27 p.m. Message for s.s. . . . . *en route* Buenos Aires to San Pedro ; then about 1,200 miles West of Callao (Peru). [Messages sent via Rugby—reply received via Los Angeles, early morning 19th.]

(4) 23/11/27 p.m. Message for s.s. . . . . diverting ship from Minatitlan (Mexican Gulf) to Curacao ; ship *en route* from Rio then about 400 miles North of Para. [Message sent via Rugby—reply received, early afternoon 24th.]

(5) 29/11/27 a.m. Message for s.s. . . . . diverting ship from Curacao to Minatitlan (Mexican Gulf) ; ship then about 36 hours off Curacao. [Message filed about 11.40 a.m., sent to Post Office, routed via Rugby—with note requesting inclusion in mid-day programme, urgent ; ; Message delivered and reply timed as filed, 13.30 GMT was received via Trinidad about 4.30 p.m.]

(6) 29/11/27 p.m. Message for s.s. . . . . diverting ship from San Pedro to San Francisco and other urgent instructions ; ship then about 1,200 miles West of Calloa. [Message sent via Rugby and reply received via Los Angeles, p.m. 30th.]

HOLIDAYS IN SWITZERLAND.

The Horsley Party will leave London on June 10 for Adelboden and Weiringen. Fortnight for Thirteen guineas. Apply to Mr. J. W. Fewtrell, 48, Frewin Road, S.W.18.

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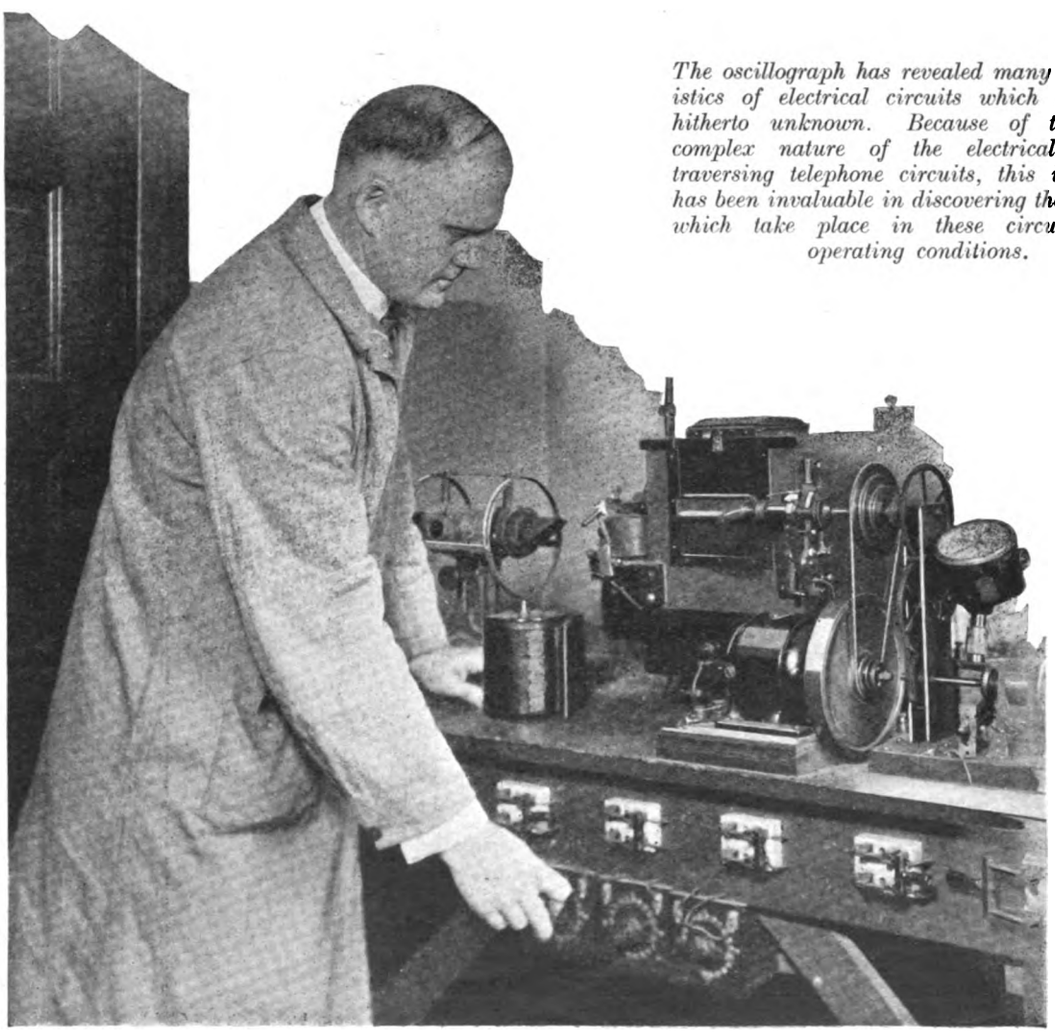

The oscillograph has revealed many characteristics of electrical circuits which have been hitherto unknown. Because of the highly complex nature of the electrical currents traversing telephone circuits, this instrument has been invaluable in discovering the reactions which take place in these circuits under operating conditions.

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The Telegraph and Telephone Journal.

PUBLISHED MONTHLY IN THE INTERESTS OF THE TELEGRAPH AND TELEPHONE SERVICE, UNDER THE PATRONAGE OF THE POSTMASTER-GENERAL.

Editing and Organising Committee - - - J. STUART JONES. W. D. SHARP. J. F. STIRLING. W. A. VALENTINE. J. W. WISSENDEN.

Managing Editor - - - W. H. GUNSTON.

NOTICES.

As the object of the JOURNAL *is the interchange of information on all subjects affecting the Telegraph and Telephone Service, the Managing Editor will be glad to consider contributions, and all communications together with photographs, diagrams, or other illustrations, should be addressed to him at the G.P.O. North, London, E.C.*1. *The Managing Editor will not be responsible for any manuscripts which he finds himself unable to use, but he will take the utmost care to return such manuscripts as promptly as possible. Photographs illustrating accepted articles will be returned if desired.*

VOL. XIV. MARCH, 1928. No. 156.

SHIPS THAT PASS IN THE NIGHT.

"SHIPS that pass in the night, and speak each other in passing,
Only a signal shewn, and a distant voice in the darkness.
So, on the ocean of life we pass and speak one another,
Only a look and a voice, then darkness again and silence."

Thus wrote Longfellow in those not far distant days when communication between ships at night was of the most casual kind, if indeed circumstances permitted any communications whatever, when even in daylight the range of communication was very limited.

It is no exaggeration to say that the shipowner lost touch with his galleons and their valuable cargoes as soon as they had left territorial waters, and that the possibilities of his getting a subsequent message from a passing ship were indeed remote. Lloyds services might give him information as regards the arrivals and departures from ports; but little, if any, other information reached him from the high seas. For these reasons the masters of ships were either bound to follow explicitly and without deviation their sailing instructions, or to exercise on behalf of the owner a very wide discretion as regards the disposal of cargoes and other germane matters. Either arrangement was not without its difficulties. For instance, a shipowner might have received information of vital importance to his interests—such as the existence of war or labour unrest at the port of destination—after a vessel left the home port, but he was unable to make practical use of it until he learnt of the arrival of the vessel at the port, when it was probably too late to act.

The term "Ships that pass in the night" thus had a real meaning in those days, but in the second quarter of the twentieth century Longfellow would probably have chosen other words to convey his meaning. The inspiration of Mr. Marconi has changed the whole state of affairs. Ships are no longer dependent for communications on daylight or on other passing vessels; they are in constant touch with one another, with their owners and with their ports of arrival and departure; and, perhaps, best of all, they can summon the nearest ships to their assistance in case of need.

The financial importance of the development of world-wide radio communication is considerable, and one important aspect of it—the power to divert a ship from one port to another without delay—can be realised by a study of the results of five messages given in another column. The saving of one day only in the travelling time of a big ship leads to a considerable economy in coal, wages, &c.; and although as a commercial proposition the expensive Rugby wireless station may not be returning a dividend to the Post Office, there is no doubt that a country like Great Britain, which depends almost entirely on its maritime activities for its raw materials and for marketing its manufactured goods, must derive much benefit, financial and otherwise, from a system which enables it to maintain constant control over all its many ventures on the high seas.

HIC ET UBIQUE.

WE congratulate our contemporary, *Electricity*, now nearly forty years old, on its new format. It is printed on excellent paper, profusely illustrated by really good blocks, and contains many novel features.

According to the *Manchester Guardian*, between 1916 and 1927 telephones installed in Winnipeg increased from 24,993 to 46,076, or nearly 100%. The population of the city is about 200,000. In Winnipeg there are almost exactly twice as many telephones in use as in the whole of the rest of the Province. Over 75% of the telephones are listed as "residence."

Statistics of the Greek Postal, Telegraph and Telephone Department show that there were 5,417 subscribers and 8,468 telephones in existence in Greece in 1926. The largest systems were Athens: Athens, with 1,800 subscribers; Salonika, with 700; and Piraeus, with 726. The Telegraph system consisted of 18,561 km. of line route and 47,989 km. of wire.

The *Daily Telegraph*, in a humorous leaderette entitled "What's in a Name?" rather misses the point of Mr. Corner's article in last month's *Journal*. It concludes:—

The Postmaster-General has thought it out, and dictionaries and encyclopædias, we are assured, were called in aid by his scholarly department. The glorious result is before us. Henceforth if men seek the neighbourhood of King's Cross, they shall ring up Terminus. It is a grand conception, the work of a master mind. Those who live in South Kensington shall now be set down as on Exhibition, and we feel already the warmth of their gratitude.

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Hackney shall bear the name of Amherst, which must have cost the Postmaster-General profound research. A region of Clapham may well be content in its connexion with the most illustrious of the Clapham school, Macaulay. Whether the Tories of Cricklewood will like to be sealed of the tribe of Gladstone we are not so sure. The Postmaster-General forgets his first principles. Shall Cricklewood have no susceptibilities?

If the Post Office had only to consider local susceptibilities, euphony, and freedom from unpleasant associations in the selection of names for London exchanges, the task would be simple. But in addition, and first of all, the name must not have the same numerical equivalent of any other name of an exchange within 10 miles of Oxford Circus. Secondly, it must be phonetically satisfactory, from a transmission point of view. Mitcham may be an excellent name for an exchange in the Mitcham district, euphonious, grateful to local susceptibilities, geographically apt and so forth, but if it be found in practice to be frequently confused with "Richmond," for example, it has to be ruled out.

According to *Telegraphen Praxis*, the number of wireless subscribers in Germany had surpassed two millions in the middle of last December.

A further extension of the Transatlantic Telephone Service to the Continent of Eürope was made on Feb. 10, when service was opened between the United States and Cuba on the one hand and Berlin, Frankfurt and Hamburg on the other hand. The quality of speech was excellent. The Chancellor of the Reich spoke to the Acting Secretary of State in Washington, who also exchanged greetings with the United States Ambassador in Berlin. The German Postmaster-General also spoke to the German Ambassador in Washington, expressing the hope that the new telephone facilities would tend to bind together the three peoples of Germany, England and the United States. A number of commercial calls followed.

Conversation to America from Germany passes over the Anglo-Continental cables to the London Trunk Exchange and thence by land line to the Rugby Wireless Station. Speech from the United States to Europe is received by wireless at Cupar, in Scotland, passes by land lines to the London Trunk Exchange, and thence via the sea cables.

Service between the United States and towns in Holland was opened at the end of January, whilst, on Feb. 20, the trans-atlantic service was extended to Stockholm, in Sweden.

The French Administration, who have adopted the Rotary system for the conversion of the Paris telephone area to automatic working, expect to put the "Carnot" exchange in service during this year, followed by the Gobelins, Diderot, Vaugirard, and Toudaine exchanges. Automatic working is already in force at Nice, Orleans, Le Havre, Vichy, Montpellier, Reims, Nantes, Marseilles (Colbert exchange). It will be shortly in service at Bordeaux, Troyes, Marseilles (Dragon exchange), and Lyons (Franklin and Burdeau exchanges).

Subscribers' complaints sometimes take the form of humorous efforts. The following letter was recently received by a District Manager from a subscriber in the Provinces:—

Dear Sir,

You remember Harry Tate's motor-car scene at the Empire:—

Harry Tate struggles with the car for half an hour, all to no purpose. The following dialogue ensues:—

His Little Boy: "I know what's the matter with the car, papa."

Harry: "What is it, my son?"

Little Boy (in Cockney twang): "It won't go!"

We know what was the matter with our 'phone yesterday—

"It didn't go, puppah."

"We know what's the matter with it to-day?—It won't go!"

"We know what will be wrong with the telephone to-morrow, puppah."

"What will be the matter, my son?"—"It won't go!!"

"Will our telephone ever be right, puppah?"

"I am afraid not for long, my son."

"Do you pay money for the telephone whether it is right or wrong?"

"I am afraid I have to, my son."

"Why don't you tell the telephone people what you think of them?"

"I will, my son."

Yours faithfully.

It may be observed that there was no fault on the subscriber's line at the time the complaint was made. He was trying to get the exchange from his home extension whilst the circuit was switched through to his office.

A Somerset subscriber wrote to his District Manager:—

"A Bath call is now a complete wash-out."

But what did he expect? He should have put in a call for Willoughby Waterless (Leicestershire) or Stoke Dry (Rutland).

THE WORKING OF THE INTERNATIONAL TELEPHONE SERVICES.*

BY H. G. TRAYFOOT.

THE advance of technical knowledge during the present century has enormously increased the range of long-distance telephony. Not only has transmission vastly improved but communication has become more stable.

This improvement has been brought about in the main by the loading of telephone circuits and by the perfection and use of the thermionic amplifier in telephone repeaters associated first with aerial wires and later with wires in underground cables. More recently wireless telephony has still further extended the range.

Until the introduction of the telephone repeater, progress in international telephonic communication was relatively slow. It was carried on almost entirely by means of overhead circuits subject to more or less frequent interruption. Efficient maintenance was moreover by no means an easy matter in the absence of any form of unified control of the testing staff.

The telephone service between England and the Continent was inaugurated in April, 1891, when two circuits were brought into use between London and Paris, and communication with Belgium was opened in 1903 with two London-Brussels circuits. At the outbreak of war, 23 years after the commencement of the Anglo-Continental service, there were but 13 circuits in operation and they carried about 1,000 calls a day.

It was during the war that the application of the telephone repeater to practical working was developed. Thermionic repeaters were apparently first used commercially in 1914 in connexion with an overhead line between New York and Chicago, and the further development of this apparatus enabled the American Telephone & Telegraph Company to open a commercial service between New York and San Francisco, a distance of 3,400 miles, in January, 1915.

The application of telephone repeaters to cables was also made early in 1915, repeaters being installed in Philadelphia on a New York-Washington circuit, 220 miles in length.

The telephone repeater was used on an extensive scale by both sides during the war. Mr. Höpfner, of the German Administration, has stated that by the use of repeaters it was possible to maintain communication between Berlin and Constantinople as well as with the German Headquarters in Macedonia, Roumania and Russia, and that 100 repeaters were used for these services. By similar means communication was maintained between the allied headquarters in France and Italy.

* Paper read before the Post Office Telephone and Telegraph Society of London.

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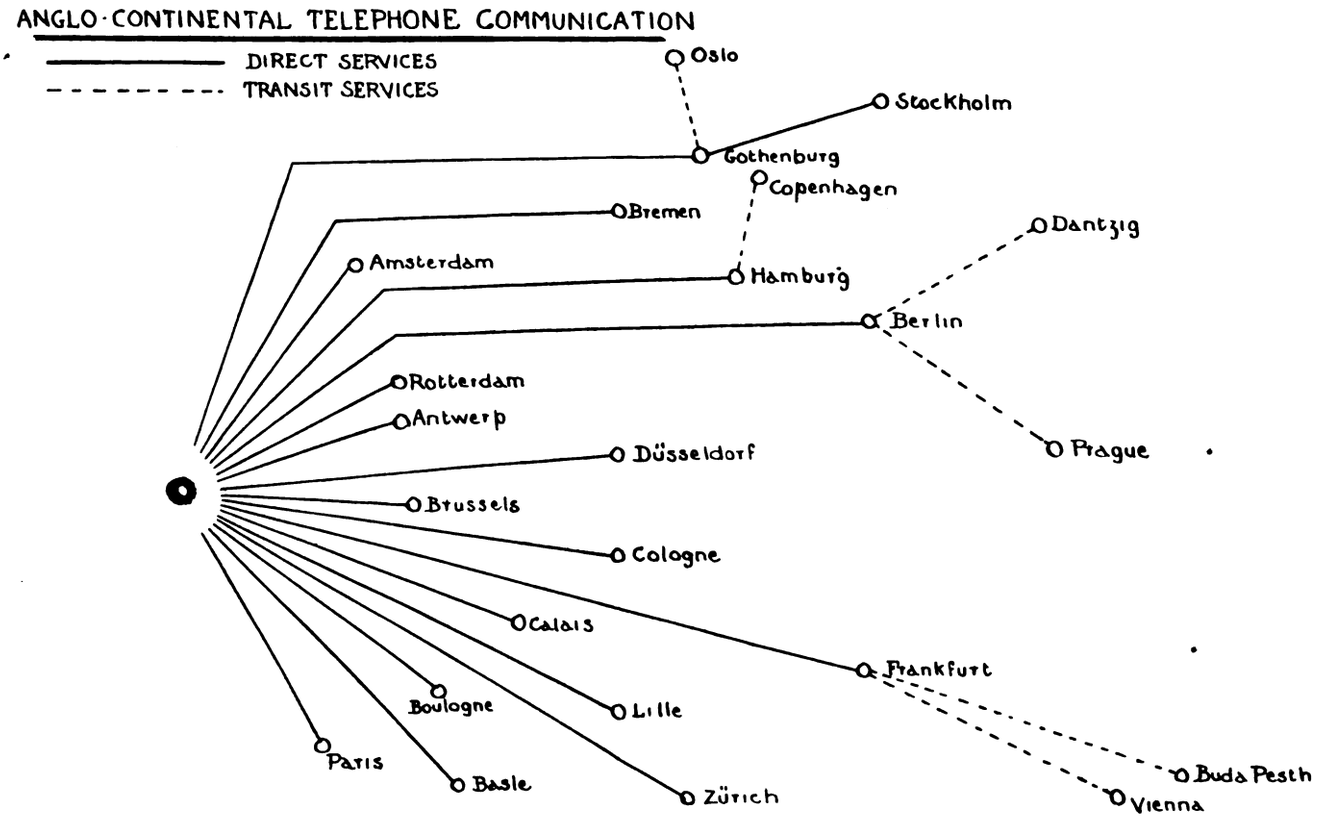

DIAGRAM A.

Our own engineers made effective use of repeaters in the internal services of Great Britain during the war, more particularly after the destruction of the overhead lines during the great storm of March, 1916, when, by the application of repeaters to existing underground plant, communication was maintained at a critical time between London and the military headquarters in the north of England and Scotland.

To those who possessed full knowledge of these developments the possibility of a vast expansion of international services was apparent.

But for several years after the war the energies of all the European countries were engaged in the difficult task of providing a sufficiency of plant to meet the demands of their internal services, which were very great during the post-war industrial boom.

Negotiations were, however, opened in various countries for extensions of international services and in September, 1922, an Anglo-Dutch service was opened by the provision of two circuits, between London and Amsterdam and Rotterdam respectively, a third circuit being formed subsequently by superposition. Matters have progressed very rapidly since that time and there are now in operation for the Anglo-Continental services 57 circuits, as compared with 13 in August, 1914, while the number of chargeable minutes per day has increased from 3,000 to 12,500.

During the year 1927 the progress was particularly rapid. On Jan. 3, the Anglo-German service was greatly extended. Additional circuits to Berlin and Hamburg were brought into use and direct communication established between London and Frankfurt, Bremen, Cologne and Düsseldorf.

In May, following the completion of a new submarine cable and new underground work in Belgium, the Anglo-Belgian service was re-organised. Additional circuits were brought into use and the older circuits replaced by conductors of greater efficiency.

Further services were opened as follows:—

With the Free City of Danzig in June, with Stockholm in June, with Copenhagen in July, with Oslo in September and with Vienna in December. On January 1 of this year, services were opened with Prague and Buda Pesth respectively.

Direct communication between England and Switzerland was also established during the year by the opening of direct London-Zurich and London-Basle circuits. Previously calls had been effected via Paris when traffic conditions on the lines between Paris and Switzerland were favourable. This was not often the case.

The accompanying diagram, marked A, shows the distribution of the circuits now working on the Anglo-Continental services. The London-Berlin circuit, with a route length of 865 miles, is the longest all-cable circuit in commercial use in Europe. The London-Stockholm circuit, with a route length of nearly 1,500 miles, has but 250 overhead.

The diagram marked B shows the development of the traffic on the more important Anglo-Continental services. The diagram C of the Anglo-Swiss traffic indicates the rapid development of the service since the establishment of direct communication.

The Anglo-French service is at the moment the poorest of the more important Anglo-Continental services from the point of view of rapidity of connexion as well as of transmission, but a great improvement will be effected when the new cross-channel cable is completed and can be worked in conjunction with the new Paris-Boulogne underground cable.

Development on a similar scale has taken place in most of the Continental countries.

For example, Holland opened a service with Belgium in 1895, with Germany in 1896 and with France in 1913, but since 1922 communication has been established with Great Britain, Denmark, Luxembourg, Czecho-slovakia, Switzerland and Austria.

Until comparatively recently most of the international circuits working in Switzerland were short-distance circuits working between places comparatively close to the frontiers, although extensions were made from the frontier exchanges to more important towns further afield. Communication was established between Switzerland and France and Germany respectively in 1892, but none of the Swiss towns had direct lines to Paris until 1920 or to Berlin until 1922. Swiss towns have in addition obtained direct communication during the last few years with London, Vienna, Prague, Brussels and Amsterdam.

Notwithstanding the enormous advance in technical knowledge, it is extremely doubtful whether it would have been possible to open so many new international services within a comparatively short period had not the facilities for co-operation between the technical staffs of the European administrations been greatly improved.

The International Telegraph Règlement, which regulated the international telephone services until recently, made no mention of technical requirements and it provided no machinery for co-operation between the staff responsible for the construction, the maintenance and the operation of the services. The section relative to telephone working formed but one chapter of the 80 odd chapters in the Telegraph Règlement. The latter came into existence as the result of the foundation of the International Telegraph Union, with Headquarters at Berne, after the Telegraph Conference of Paris in 1865. The chapter relative to telephones was introduced at the Conference of the Union held at Berlin in 1885 on the initiative of the German Administration, who pointed out that the use of the telephone service was growing daily and that there was an increasing need for extending the service beyond the national frontiers. In this way international telephony came under the protection of the International Telegraph Union.

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By 1914, the chapter had grown considerably, but the provisions were, in the main, in the nature of fundamental principles. The small amount of technical detail included referred solely to the traffic aspect of the working.

A year or two after the war a writer in the French official publication known as the *Annales des Postes, Télégraphes et Telephones* had advocated the formation of some new body to facilitate co-operation between the staff engaged in technical work in Europe, but nothing appears to have been done at the time to follow up the proposal.

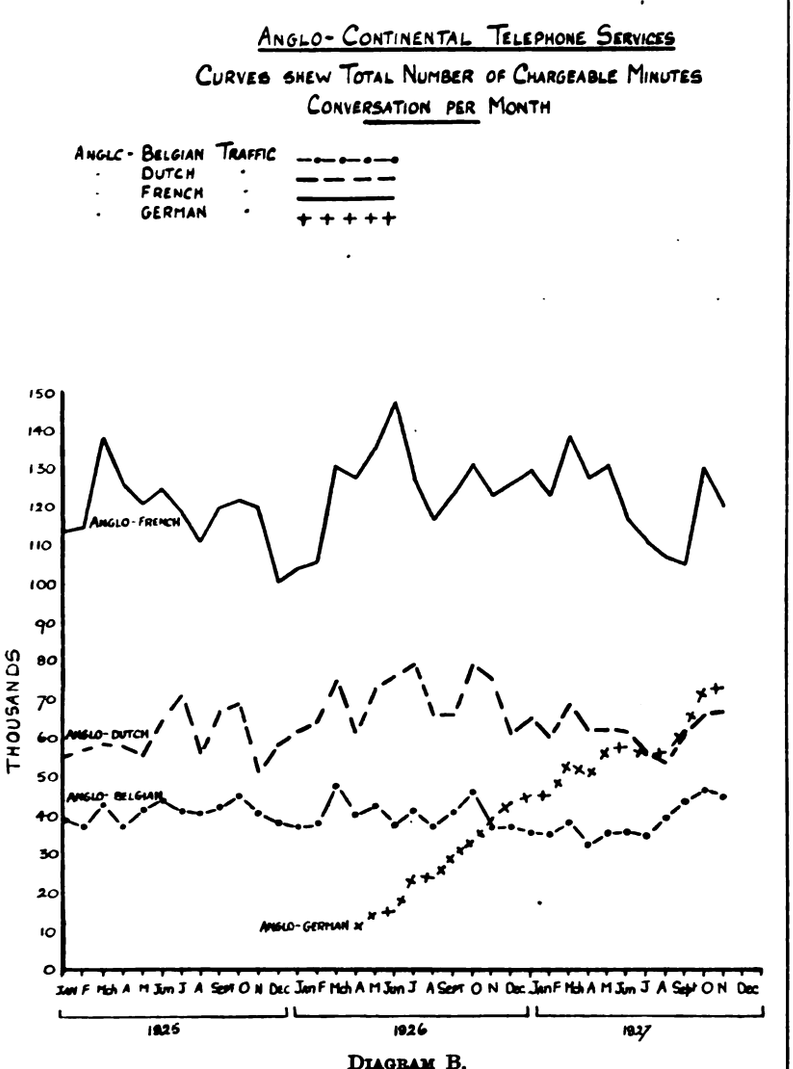

DIAGRAM B.

In November, 1922, however, Mr. Frank Gill, in his presidential address to the Institute of Electrical Engineers, after detailing the enormous advance in long-distance telephone working in America, made a strong plea for the adoption of some unified method of handling the international telephone services in Europe.

He outlined several alternatives, but the only one which appeared to have any immediate prospect of success was a proposal that the Administrations operating the services should combine to form a new organisation to deal with the technical and other problems involved.

Shortly afterwards, the French Administration, on the initiative of the late Monsieur Dennery, an Inspector-General of Posts and Telegraphs, invited 5 other Administrations to send delegates to Paris to consider the formation of an association of this character and in March, 1923, a meeting was held, the countries represented being Belgium, France, Great Britain, Italy, Spain and Switzerland.

This Conference, known as the Preliminary Technical Committee for Long-Distance Telephony in Europe, recommended that a new organisation, to be open to European countries generally and to be known as the "International Consultative Committee for Long-Distance Telephonic Communication," should be set up forthwith.

This Committee was to be charged, in the first place, with unifying the views of the various countries on international telephony and with collecting information on technical and statistical matters bearing on the subject. The resolutions passed by the Committee would be in the nature of recommendations, with which the European Administrations would be asked to conform as closely as possible, as much in their own interests as for the general good.

The Preliminary Conference also passed with unanimity a considerable number of resolutions on various engineering and traffic questions and drew up provisional programmes of new circuits to be constructed.

The proposals of the Preliminary Conference were accepted by 19 nations, each of which sent delegates to the first meeting of the International Consultative Committee held at Paris in 1924. The Committee drew up a Constitution, appointed a sub-committee, to consider in detail the subjects to be discussed at the next Conference, agreed on a scheme for the division of the working expenses of the Committee, and discussed the resolutions adopted at the Preliminary Conference, many of which were modified. The study of several new problems was also undertaken, notably the question of adopting an international unit of transmission and the preparation of a scheme for calculating the charges for international telephonic communication. A new programme of work to be undertaken was also prepared.

At the second meeting of the Consultative Committee (by this time known generally as the C.C.I.) in June, 1925, the scope of the work was again considerably extended, notably in the direction of the study of transmission problems and questions relative to the protection of telephone lines from the disturbing influences of power installations. For the first time, the Conference was attended by representatives of the more important European companies concerned in the manufacture of telephone plant, by representatives of the International Railway Union and the International Conference of Systems on High-Tension Electrical Energy. The representatives of private industry were not admitted to the full meetings of the Consultative Committee and had no voting power on the sub-committees which they attended, but their collaboration in the work of the Committee has added greatly to the value of the decisions taken.

At this Conference an interesting question was raised. The Consultative and Technical Committee on Communications and Transit appointed by the League of Nations suggested what would have been, in effect, the affiliation of the C.C.I. with the League. But there was at least one strong reason why such an amalgamation could not be arranged. Germany was not then a member of the League, although she was participating most actively in the work of the C.C.I.

The proposal of the League was consequently rejected, although it was decided to forward to the Technical Committee of the League copies of all resolutions adopted by the C.C.I.

There had from the outset been concern in certain quarters owing to the fact that the C.C.I. had no official or diplomatic sanction as an international organisation and the incident just mentioned probably added to the disquietude felt in those quarters. Accordingly, when the International Telegraph Conference met at Paris in September, 1925, an effort was made

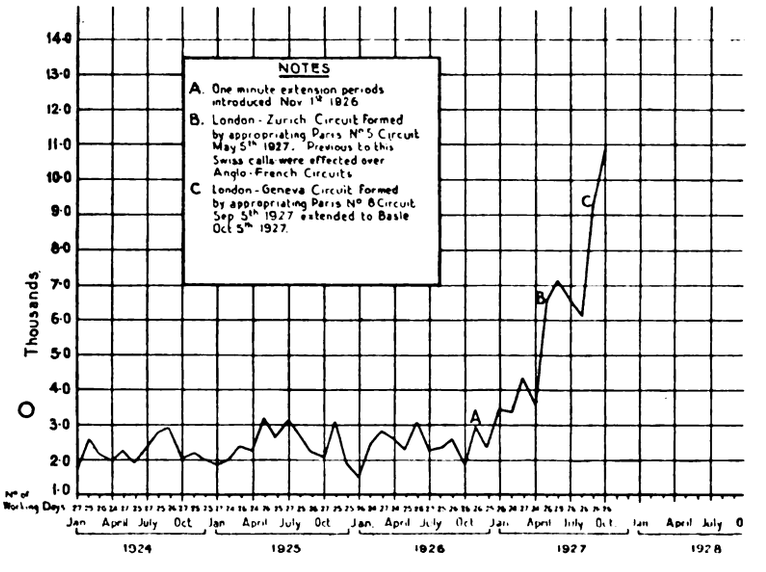

DIAGRAM C.

to form a general Technical Committee, to be associated directly with the International Bureau at Berne, and to deal with all questions relative to electrical communication, both telegraph and telephone. This Committee would, had it been established, have taken over the work of the C.C.I.

A more satisfactory solution was, however, arrived at. A paragraph was inserted in the Règlement sanctioning the establishment of a Consultative Committee charged with the study of standards regulating technical and operating questions relative to international long distance telephony. This Committee was, however, allowed to maintain a separate organisation and the C.C.I. was thus able to continue its work without interruption.

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The Telephone Section of the International Telegraph Règlement was the subject of prolonged discussions. The British contention was that the Règlement should be a statement of general principles and that a detailed code of working instructions should be prepared as an entirely separate matter by the C.C.I.

In the result the old Règlement was very considerably amplified but many of the new services and methods introduced were not made obligatory, *i.e.*, their introduction in individual services was to be subject to special arrangements between the Administrations concerned.

A brief reference to some of the leading provisions of the Règlement will convey some general idea of the lines on which the international services are worked.

(1) "The Administrations shall maintain and work their lines in such a manner as to ensure a staple and rapid service, with good transmission. The Administrations shall conform as far as possible to the recommendations issued by the C.C.I. on long-distance telephony as regards equipment, apparatus, relays, loading, transmission equivalents, &c."

The first part of this paragraph is delightfully vague. No lead is given as to the steps to be taken from a traffic standpoint to ensure "a staple and rapid service." Indeed, there is nothing to indicate what is to be regarded as a "rapid" service. The same cannot be said of the second part as one record alone of the proceedings of the C.C.I. contains nearly 300 pages of recommendations on engineering matters.

(2) "International calls have priority over inland calls on the internal circuits in the countries concerned."

(3) "Urgent private calls having priority over ordinary private calls *may* be admitted by special arrangement, at a charge equivalent to three times the charge for an ordinary call."

The British Administration has not taken advantage of this provision.

(4) "Lightning calls having priority over all other private calls *may* be admitted, by special arrangement. The charge is fixed at 10 times the charge for an ordinary call."

The British Administration does not admit calls of this category. It may be stated that very few such calls are made even in countries where this class of call is permitted.

(5) "Government calls, urgent and ordinary, with priority over private calls of the same category, are admitted."

(6) "Subscription calls at fixed hours for a period of at least one month are allowed, by special arrangement."

During the slack hours, the charge is half the ordinary rate. During the busy hours if such calls are permitted, the charge is three times the ordinary rate. Subscription calls during the busy hours at urgent call rates were not provided for previously.

In the international services in which this country is concerned, subscription calls at half-rates are permitted during the slack hours and ordinary calls at three-fifths of the ordinary charge are also permitted during such hours. Subscription calls are not, however, accepted during the busy hours.

(7) The charges for international calls are made up of terminal charges and, where appropriate, of transit charges. Most of the European countries are divided into zones for the assessment of charges to places distant from the frontiers. For this purpose Great Britain has three zones.

Each Administration fixes its own terminal and transit charges and is credited with these portions of the total fee. The gold franc is the monetary unit adopted as the basis of international charges.

At the Conference in 1925 a determined, but unsuccessful, effort was made to lay down definite figures as a basis for the calculation of international charges. This was strongly opposed by the British representatives, but the proposal was defeated because the Administrations which desired to insert figures could not agree as to what the figures should be.

"Each Administration which furnishes a line through its territory to form part of a direct line between two other Administrations has the right to demand a minimum revenue."

(8) "All calls equal to or less than 3 minutes are charged for as for 3 minutes. When the duration exceeds 3 minutes, a charge per minute is made for the period exceeding the first three minutes."

This was a highly important innovation. In the old Règlement, calls were charged for in indivisible periods of 3 minutes. The new arrangement involves some loss of revenue, seeing that about 10% of the international calls originated in Great Britain are of 4 minutes' duration and 12% of 5 minutes' duration. Conversation is limited to 6 minutes if other calls are waiting to be effected on the same route.

The average duration of an international call originated in Great Britain is about 5.2 minutes.

(9) "A subscriber may specify that a call is to be cancelled if it has not been effected after a certain interval has elapsed."

(10) "If one or other of the subscribers does not reply, an Administration *may* levy a special charge for the work performed."

An effort to make such a charge obligatory was strongly resisted by the British representatives and was defeated only by a small majority. The British contentions were that charges for incompleted calls cause irritation to subscribers, and that the cost of operating such calls should be taken into consideration when the general tariff is fixed. It was also pointed out that when such charges were made in this country the total revenue derived from them was very small..

(12) "A demand for a call may be accompanied by a préavis, the object of which is to advise a subscriber's station that the demander of a call wishes to exchange a conversation at that station with a person designated by name."

The préavis service has been highly developed in the Scandinavian countries. The service is different from the "person to person" service of which so much use is made in America, under which a particular person is named to take the call at each telephone and the call is not effected until both these persons are in attendance. Even in Europe the arrangements for working the préavis system are not by any means uniform. The Scandinavian system is more closely allied to the American "person to person" system than that in use in Germany. In Sweden, if the particular person is not in attendance when the call matures only the préavis charge (i.e., one-quarter of the unit fee) is collected. In Germany both the full basic charge and the préavis charge are collected. The préavis service is not at present in use on the Anglo-Continental services, but the introduction of some system of calls for particular persons seems imperative if these services are to become as popular as they deserve to be.

(13) "The signal indicating the conclusion of a call must be given by the subscribers concerned."

This implies that there is no obligation on the part of the Administrations to advise subscribers that the period demanded has expired. It is, however, the practice in this country to give a subscriber a notification to this effect at the end of each period of 3 minutes and to ask him whether he wishes to extend his call. The British Administration appears to be the only one which adopts this procedure which is needless to say a great drag on the operating.

(*To be continued.*)

PRESS TELEGRAM WORK.*

BY J. NEWLANDS, C.B.E., C.I.E.

(*Continued from page* 113.)

ON DEC. 2, 1904, the Postmaster-General, Lord Stanley, M.P., was informed by a newspaper deputation that "the number of words in Press messages has increased since the Department took over the wires from about 20 millions to 760 millions a year." It had been multiplied, then, by 38 times!

After the transfer the Postal Telegraph Department had, on Oct. 18, 1870, only three YQ circuits in the Central Telegraph Office used exclusively for sending news, viz.:—

(1) London, Nottingham, Sheffield, Leeds, Newcastle-on-Tyne, Edinburgh, Glasgow.

(2) London, Birmingham, Liverpool, Manchester.

(3) London, Bristol, Exeter, Plymouth, Cardiff, Newport, Gloucester.

The total number of separate towns which had been supplied by the Companies was 144, with 306 subscribers for news, while the Post Office immediately took on 365 towns, with 1,106 subscribers for news. These numbers were very soon considerably expanded.

Owing to the enormous increase of Press work the number of YQ circuits in the C.T.O. for news traffic alone gradually rose to 23 and these wires had ramifications all over Great Britain and Ireland. The more important of these circuits were duplicated, triplicated after 6 p.m., and even quadrupled for very special occasions, such as the "Budget" or any other Parliamentary event of surpassing importance. Frequently on busy Parliamentary nights as many as 500,000 words were sent. On one occasion the total reached 1,050,500 words. That was when Mr. Gladstone introduced the Home Rule Bill for Ireland on April 8, 1886.

Of course, there were many other towns of minor importance which could not be accommodated on the above-mentioned 23 special wires in the News Division of the C.T.O., consequently the punched slips for all such places had to be conveyed by hand and in large numbers throughout all the more important divisions. There the news was sandwiched in along

* Paper read to the Post Office Telephone and Telegraph Society of London.

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with the public telegrams, but of course, this procedure resulted in delays, which were apt to lead to strong complaints from the newspapers situated in those towns.

The News Division had a system of pneumatic perforators capable of producing as many as eight slips for distribution to various circuits. It had a most carefully selected body of telegraphists, who were ably supervised. The apparatus and also the wires were of the best available kind and everything possible was done to secure a prompt and efficient service. While I occupied the position of Controller of the C.T.O. scarcely anything gave me more genuine pleasure than to watch the expert disposal of the vast volume of news traffic on such a day as that of the "Budget."

The News Associations occasionally offered well-deserved praise to the Telegraph Department, but they more frequently blew cold rather than hot, and they, together with newspaper proprietors and Members of Parliament, organised repeated deputations to the Postmaster-General as a means of demonstrating the delinquencies of that oft-maligned Department. According to them, the postal telegraph system had become inadequate to provide for the increasing hurry, competition and earlier publication of the provincial newspapers. The "evening" papers especially demanded to be put more upon an equality with the larger and wealthier "morning" papers, many of which possessed special or private wires from Fleet Street direct into their publishing offices and this great advantage enabled them to compete on unequal terms with numerous small papers in their vicinity. They made use of the "Stop Press" and rapid delivery by motor vans. The number of "evening" newspapers has increased enormously since 1870, when there were but three or four deserving of the name. At the present time they number about 100, and of these no fewer than 80 are connected with the Press Association system. The other 20 are mainly small local sheets. The "evening" papers of to-day are the direct product of the low telegraph rates introduced under the postal system, and for their daily news supply they are almost entirely dependent upon the cheap "copy" rate messages or their equivalent as now furnished by the P.A. or other news agencies. There could be no more cogent argument in favour of the contention that the low Press rates greatly benefited the newspapers than is to be found in the rapid, almost miraculous expansion of "evening" papers, both as regards their numbers and importance. They have not only multiplied, they have advanced in every possible way until they are now an absolute necessity for the reading public. Moreover, they are requisite for local advertising. By means of their numerous editions they cater for all classes as they cover not only general home news and foreign from Reuters, but also every possible phase of sport, such as racing, cricket, football, shooting, swimming, greyhound racing, tennis, golf, aviation trials, coursing, billiards, &c., and every conceivable "stunt" which is likely to interest the public.

The newspaper proprietors were keenly desirous of being able to set aside delayed or belated news after it had been handed in to the Central Telegraph Office, London, for transmission in order that "RUSH" messages containing news of a far more important kind might be immediately dealt with on request. The Post Office being bound by its rigid system of "Code Time," could not possibly agree to such a revolutionary proposal.

When Mr. Sydney Buxton (now Lord Buxton) was Postmaster-General in 1907 a definite move forwards was inaugurated and the way was gradually cleared whereby the Post Office finally agreed to lease wires either to the Press Association, the Central News or other Press agency, as they had done for many years to newspapers. This enabled them to form joint telegraph circuits from their own offices directly connected with either "morning" or "evening" newspapers. These wires, if suitably routed and managed, would admit of 4, 6 or 8 papers being joined up on one circuit. It was not until the year 1920 that the P.A. began operations on this plan in a very cautious manner. The first P.A. joint wire was from London to Bristol. Exeter, Plymouth, Newport, Cardiff, Bath and Swansea were soon added and this was called the "Bristol Area." The scheme commenced operations to a number of these places on Mar. 1, 1920, and it proved an immediate success. After a reasonable period had elapsed, fresh extensions were made and new "areas" were gradually opened at Birmingham, Manchester, Leeds and Glasgow. These were termed P.A. "Centres." The wires—half of which are underground and half aerial—are leased from the Post Office at highly remunerative rental terms. In order to avoid confusion with existing Post Office codes it was decided for the sake of simplicity to use the first two letters only, thus :—

BI —Birmingham.
BR—Bristol.
MA—Manchester.
LE—Leeds.
GL—Glasgow.

The Head Office in Fleet Street is, of course, P.A. This simple plan made it easy for the P.A. Editorial Staff to memorise the selected code letters. Each of these "Centres," together with the wires they control in their own area, will be illustrated on the screen, thus showing how the various newspapers in towns throughout the United Kingdom are grouped around their appropriate "Centre."

Much valuable assistance has at all times been rendered to the P.A. by the staff connected with the G.P.O. Secretariat, by the Engineer-in-Chief's officers, by the C.T.O. and all Test officers throughout the country. Prompt and immediate attention has been given whenever required and faulty wires have been "made good" just as readily as if they had been public wires belonging to the Department. The relations between the P.A. and the G.P.O. have been most amicable.

We have two wires between London and Bristol, two connecting the P.A. with Birmingham and Manchester, two connecting the P.A. with Leeds, and two connecting Manchester with Glasgow. The second wires, London to Bristol and Manchester to Glasgow, are "night" wires only, opening at 4 p.m. All other wires throughout the country are single wires, leased for the full 24 hours per day, and in their totality they carry a very heavy load of daily traffic. The Bristol and Birmingham "Centres" are connected together and so are Manchester and Leeds. These cross-country circuits are primarily provided as reserves and they have frequently been found to be most useful in emergencies.

The lantern slides give a clear idea of the ramifications of the P.A. joint wire system, and of course it will be understood that, apart from our "Centres," all outgoing wires terminate within newspaper offices, and, by a definite arrangement, their Telegraph Room is always placed in close proximity to the sub-editorial department in order to reduce to a minimum any possibility of delay in transmission. This also eliminates delay in delivery by boy messengers. A rapid means of conveying important "results" or "rush" messages directly to those who manipulate the linotype machines is arranged for within each newspaper office. No device is neglected which may facilitate the prompt handling of the "news" and every second of time counts, especially where there is opposition to be contended with.

The general equipment in Byron House, the headquarters of the P.A., is replete with every means of expediting the treatment of the work. There is a pneumatic tube from the dispatching room, which is connected with the editorial, the joint service, the racing and golf departments, a Lamson lift from the editorial, a house telephone system, two teletype circuits to the C.T.O., a similar one to the Royal Law courts, two wires to the House of Commons. As a rule there are eight provincial YQ wires linking up to P.A. centres and to all intervening newspaper offices. The instrument room is so arranged that the "copy," on receipt, is placed on a small distribution table, each page is dated and timed in one operation and passed on to the punchers, who operate anything up to seven Kleinschmidt keyboard perforators right and left of the circulation table, which, in reality, is our "Intelligence Department." It is a *one* person job, and the traffic is rapidly handled. When the punching operation is completed, the perforated tape is wound up on a slip wheel, which, with the "copy," is at once conveyed to the number one or first wire, where as a rule immediate transmission takes place. The wires are arranged in two groups of three, and one of two, YQ circuits. While the original punched slip is running through number one transmitter it automatically throws off two replica slips and these are utilised for immediate transmission over the second and third groups of YQ wires. This device ensures that practically all offices are being supplied as nearly as possible simultaneously. It is not an uncommon thing for a brief "RUSH" message to be circulated, punched and run through on all eight circuits in one minute, if there are no interruptions at the time.

When there is an important trial in a provincial town the P.A. leases a local telephone and passes over it either the evidence or a summary of if and the verdict. These are re-circulated over the entire P.A. telegraphic system. On repeated occasions this work has been so smartly done that newspapers in the locality of the court have preferred to take the P.A. report rather than rely on their own correspondents handing in separate Press messages to be signalled over the Post Office public wires, where there may be congestion and consequent delay. In like manner the results of all by-elections are telephoned direct to the P.A., usually from the building where the poll is declared, and the process of 'phoning, punching and transmission is accomplished so rapidly that the information may be signalled all over our system before many in the crowd outside the polling place are even aware of the "result."

An equally great feature would be made of the prompt disposal of the verdict in an important murder case where the trial had taken place in the Old Bailey. The Press Association is out to beat, in point of time, any other distributive news agency if it be at all possible. On one occasion a most enterprising London paper obtained its first intimation of a certain Royal event from its provincial office in the Midlands, where they had received the news from the Press Association a considerable time before. This gives evidence of enterprise and up-to-date methods.

All evening newspapers now devote much space to general sports, and particularly to the "results" at race meetings. In these circumstances the Press Association makes a supreme effort to obtain and rapidly transmit all such items. How is it done? A representative of the Press Association sits usually in a direct line with the winning post, or as near to it as he can get, at all important race meetings. He has continuous command of a telephone circuit from the racecourse, which is led into the respective offices of the Exchange Telegraph Company and the Press Association in London. We shall imagine he is at Epsom dealing with the most famous of all races, "The Derby," on June 1, 1927. The great race is timed for 3 p.m., but a few difficulties arise in getting all the horses placed in their respective positions for the start. There may even be one or more false starts, but finally the "Off" is telephoned at 3.9 p.m. and is at once telegraphed. The "Derby" takes about 2½ minutes to run. Meanwhile all our circuits have ceased working, specific instructions having been previously issued that on no account whatever must anyone interrupt after the "Off" has been signalled. All must be on the alert. There is a tense and eager "hush." Meanwhile the horses are careering round the world-famous Epsom Racecourse, with its multitudinous crowd. All the jockeys are anxious to win. At each transmitter in Byron House (Press Association Head Office) there is placed a typewritten list giving the number and name of each running horse, together with the jockey's name. We know to within a few seconds

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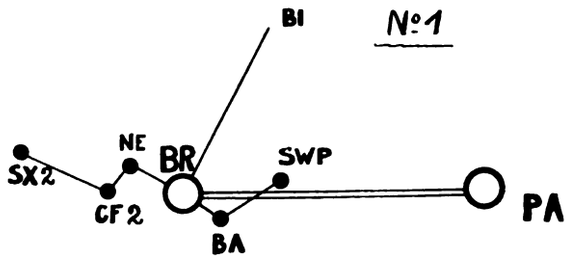
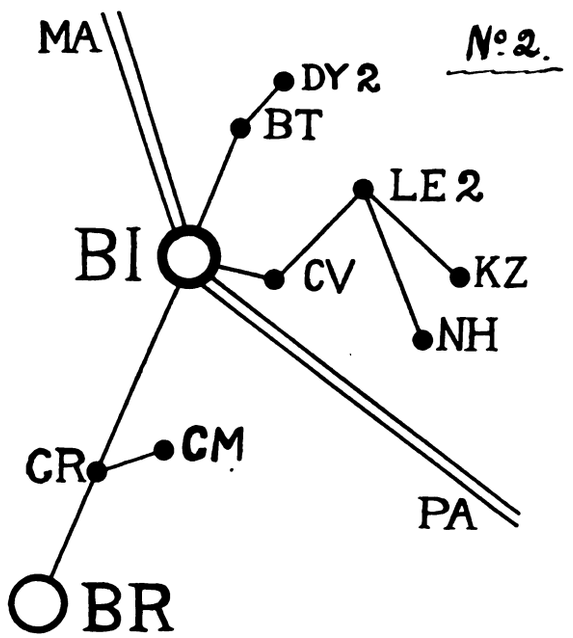
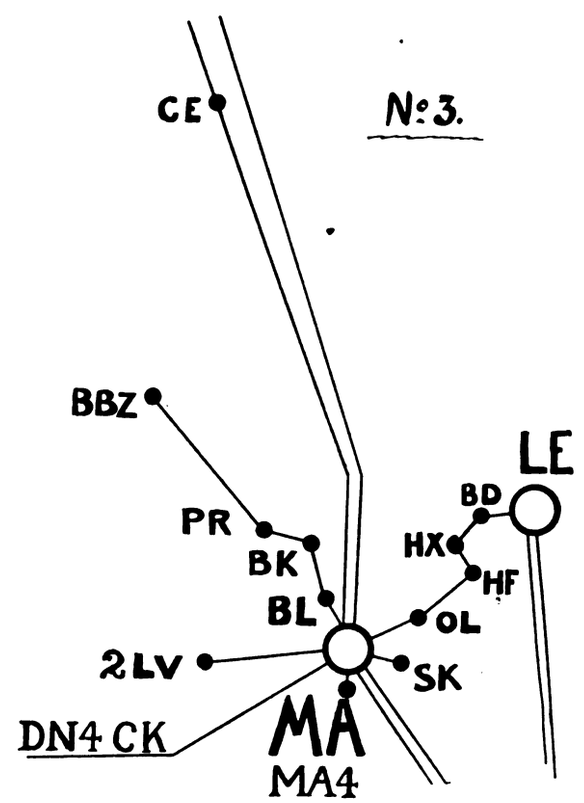
DIAGRAMS ILLUSTRATIVE OF MR. NEWLAND'S ARTICLE.



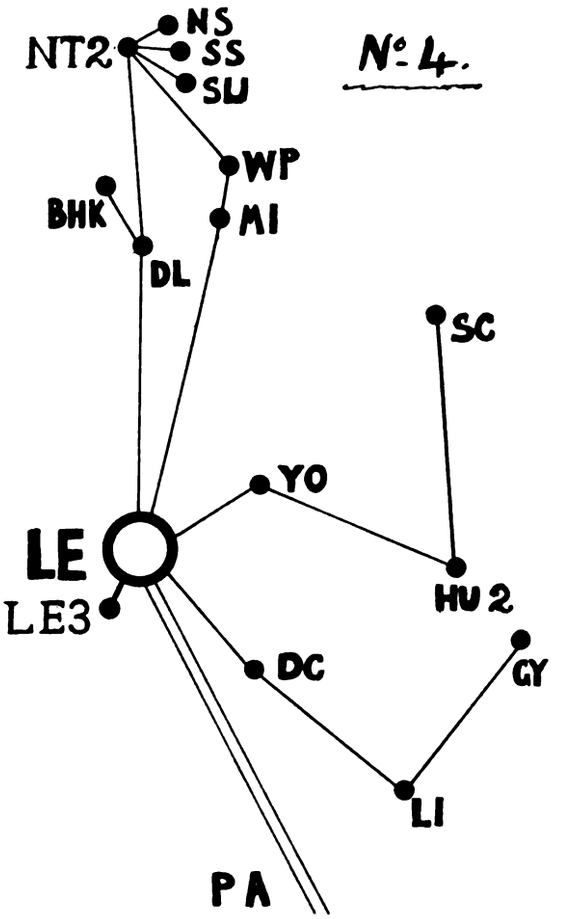
BR = BRISTOL.



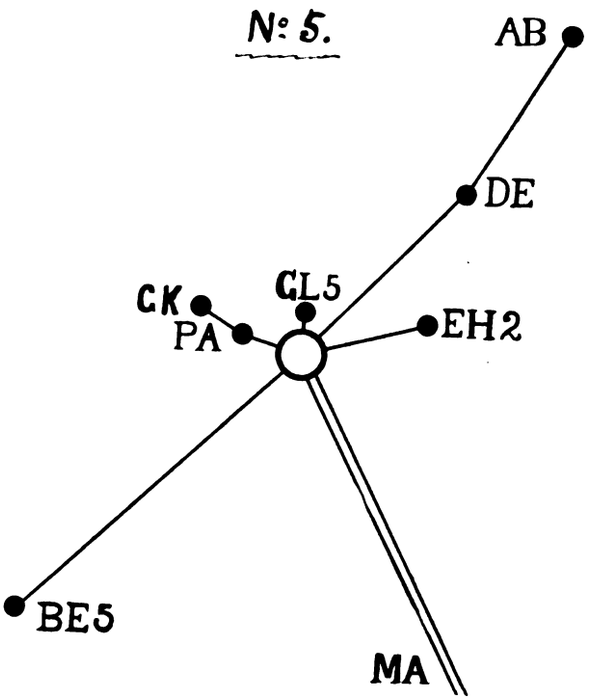
BI = BIRMINGHAM.



MA = MANCHESTER.



LE = LEEDS.



GL= GLASGOW.

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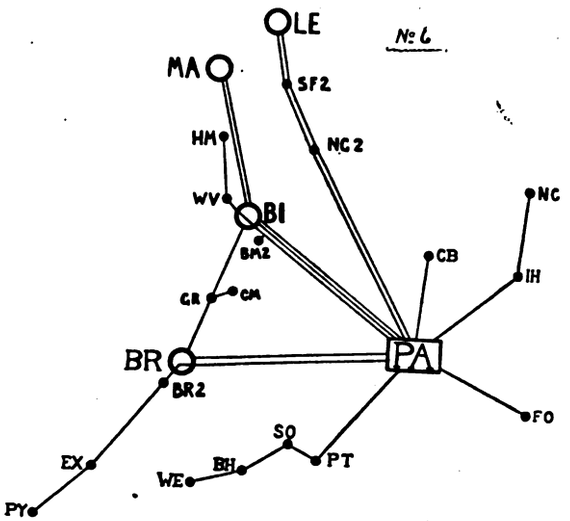

GENERAL SCHEME.

when the race should finish. At 3.10 our expert telephonist sings out "At Tattenham Corner 'Call Boy' is leading 'Shian Mor and 'Sickle.'" Then, almost precisely at 3.11¼ he calls out "Number three, 'Call Boy,' the winner," followed by "Number ten second" and "Number seven third." Each operator "keys" by Morse instantly the 1st, 2nd and 3rd number and name and immediately thereafter a punched confirmation is flashed by fast speed Wheatstone over the wires lest any error or mis-sending may have occurred. So rapidly is this process carried out that the fact that "Call Boy" has won is all over our system from Plymouth to Aberdeen, from Cork to Belfast, before the winning horse has been pulled up after passing the winning post. Indeed, all the provincial centres reported next morning that the "result" reached all offices at 3.11¾. So much for effective organisation and so much from an excellent and willing body of carefully selected and thoroughly efficient telegraph operators, not only in London, but at each P.A. provincial centre. The main function of the Exchange Telegraph Company—whose operator has been "listening in" on the same racecourse telephone—is to use their tape machines to advise newspapers, clubs, hotels and bookmakers in London of these and similar "results." Their keyboard tape machines are slower in their operation than our P.A. telegraphic system and it may be confidently affirmed that all our subscribers have the "winners" as speedily as the Exchange Telegraph Company's subscribers within London. Visitors to Byron House are staggered, as a rule, at the rapidity of the operation. That is as it should be, on the principle that "if a thing is worth doing it is worth doing well." By the way, as regards the Derby "result" last June, the Exchange Telegraph Company's Dublin office volunteered the information that "we had beaten the wireless." We have certainly left the carrier pigeons at Goodwood far behind!

Provided you can get into direct communication by telephone with every subscriber precisely at the psychological moment there is no known system so rapid and reliable as that of telephony, but, on the other hand, the Press Association system of joint wire telegraphy working through automatic Creed receivers and utilising a method of human repeater from point to point is an easy "second" and is probably the quickest known means of telegraphing urgent news over a wide area. It could scarcely be improved upon.

The "Budget" is treated in an equally prompt manner. We deal with "points," "column summary" and a "verbatim" report for the larger "morning" papers. The "points" are those items where the Chancellor of the Exchequer either imposes a fresh tax or increases an existing one, or, alternatively, where he reduces or abolishes a tax. As soon as these "points" are uttered in the House of Commons they are telephoned to Byron House and transmitted to all our newspaper subscribers almost red hot out of the Chancellor's mouth. The "Budget" is our high-water mark day for excessive pressure. Every page in the summary or column report and also those in the verbatim report in sections is transmitted and delivered in strict page order. This is a great boon to sub-editors.

Similar rapid treatment is accorded to all important messages specially marked "RUSH."

These observations will enable you to appreciate the great advantage which our system possesses in not having to regulate our traffic by "code time." To the utmost possible extent we endeavour to meet the up-to-date requirements of the newspaper press.

The P.A. deals in numerous services and these may be reckoned up to about 150 in all. Every newspaper can, therefore, specify exactly which of these services it will take and pay for. Unlike the practice of the Telegraph Companies with their 4,000 words a day, take it or want it, each paper now receives precisely what it has ordered and it receives just what it wants for publication. Moreover, their lists of services can be varied at will at any time.

Market Reports.—Formerly all market reports were handed in locally to the nearest postal telegraph office and transmitted thence to all subscribing newspapers on behalf of the P.A., C.N. and Exchange Telegraph Co., but as soon as the P.A. telegraph system had been developed nation-wide I made a businesslike suggestion that to the utmost possible extent these market reports should be handed in at one or other of our own offices and circulated direct to the respective newspapers. This plan was gradually adopted and resulted not only in an accelerated treatment with earlier delivery but also in very considerable economy of costs for transmission.

Many of my audience will recollect that an important committee appointed to consider the question of high-speed telegraphy, after hearing much evidence, furnished a long report dated Jan. 19, 1916. That document was signed by Cecil Norton, Assistant Postmaster-General, as Chairman, and by Messrs. J. Gavey, John Lee, W. M. Mordey, A. M. Ogilvie, W. Slingo and A. B. Walkley. In paragraphs 39 and 40 they "dealt with the special requirements of news traffic." It is interesting to read the following extracts from paragraph 40. "The Press representatives who gave evidence before us frankly admitted that the news service gave general satisfaction, and disclaimed all intention of having asked for a hearing in order to make complaints." . . . "The evidence given on behalf of the newspapers in smaller towns did not suggest that there was any ground for complaint except for the almost inevitable fact that news does not reach small towns quite as soon as it reaches large ones. The installation of the Creed receiving apparatus at small offices would be impracticable on the ground of expense and we fear that newspapers published at such towns must continue to receive their news after their competitors, and without the aid of printing telegraphy, until progress has been made which will enable the Post Office to extend printing methods to such offices and to remodel greatly the present methods of news circulation."

That is a remarkable extract, but I think you will admit it is far more remarkable that the Press Association, alone and unaided, has already developed its entire system by the installation of Creed receiving apparatus at six "centres" and 123 newspaper offices, so that to-day the smaller towns alluded to are actually receiving their news supply at the same moment as their competitors in the larger towns. The alleged impracticability, "on the ground of expense," has been entirely overcome and the receiving apparatus has all been paid for out of revenue during the past seven years. It may be fairly added that we have by the same process remodelled greatly the methods of news circulation. The results achieved are something to be justly proud of.

All our wires are now arranged on the "leak" principle instead of each office being in "series." This plan has greatly reduced the number of interruptions as minor apparatus troubles do not stop the entire circuit.

We manage to carry on under very simple but perfectly definite rules, 38 in number, and these are found to work smoothly and effectively as the regulations are easily remembered and carried out.

The Press Association never complains to the Post Office if interruptions are suspected or known to have been due to stormy weather or other similar cause of breakdown.

The newspapers now pay in full for all the news supplied to them by the P.A.

It may be added that while the Press Association system has been gradually built up at great cost its proved efficiency has fully justified the expenditure incurred. All our subscribers recognise this fact and they are satisfied.

One of the most surprising facts is that the whole staff employed at Byron House, including supervision, operating and clerical force, consists of 45 persons, 34 male and 11 female. This staff covers both day and night service. The women cease work at 8 p.m.

In addition to the foregoing, we have four highly-skilled mechanics thoroughly accustomed to and conversant with Wheatstone, Creed and other telegraph apparatus, including keyboard perforators.

On an ordinary average day the Press Association deals with about 75,000 actual words. On a busy day the number ranges up to over 90,000. The removal of this quantity of traffic from the public wires should have given a great measure of relief to the Central Telegraph Office and also to a large number of provincial telegraph offices where newspapers are published, enabling the latter especially to modify their irksome night duties and reduce their heavy costs.

It must also be pointed out that the Press Association now pays to the Post Office many thousands of pounds per annum for costly wire rentals and "power leads." At the same time the large expenses for wages, at approximately one hundred offices dealing with the Press work now passing over the Press Association joint wire system, has been transferred from the Post Office altogether and is now borne by the proprietors of the newspapers and the Press Association. The savings thus effected when added to the economy of apparatus and slip at all news offices, the reduction of staff, supervision and lighting, the simplification of the C. & A.G. system of accounts should total up to a very considerable sum. I can only hope that the Post Office has earmarked all these economies and has reaped some clear and well-defined profit by the removal to other shoulders of a large mass of work which they always protested was performed at a heavy loss.

If my work at the Press Association has enabled the P.O. to "cut" some of its losses I shall be for ever thankful to have been of some practical use in that direction.

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THE G.P.O. PLAYERS DRAMATIC SOCIETY.

The Chinese Puzzle.—A Play in Four Acts, by Marion Bower and Leon M. Lion. At King George's Hall, Caroline Street, W.C. Feb. 17 and 18, 1928.

IT is really refreshing to find a play which includes in its cast an oriental—especially a Chinese—who is not the villain of the piece; and who does not move in a sinister atmosphere of pistolry. There are in this play two Chinamen, an international financier and sundry diplomats, and yet the only gun which goes off is a "great gun" from the Foreign Office! No pistols, no poison, no dope! Even the adventuress (if we may so style the heroine's mother—excellently played by Miss Cowan) is only on the stage for a few minutes in one act. This is evidently no stuff for the red-blooded he-man, the amateur of lethal weapons whose formula for a play must contain an adequate co-efficient of corpses. It will, nevertheless, please all those who like a moving and well-constructed play the interest of which is maintained to the very end.

The Marquis Chi Lung considers himself under a sacred debt of gratitude to the late Sir Roger de la Haye, a debt which he is biding his time to pay in full to Sir Roger's son. The Marquis appears at the young Sir Roger's country house to negotiate (with the tacit blessing of the Foreign Office, to which Sir Roger is attached) a Chinese loan with Paul Marketel, the international financier. When the transaction has been concluded and the document is in Sir Roger's desk, it is surreptitiously photographed by the heroine (Naomi Melsham) at the instigation of her mother, and the precious secret is soon blazed abroad in the Press. Sir Roger is disgraced for his alleged want of care and, under a cloud, has to resign from the Foreign Office.

In Act III, ten months later, we find Sir Roger married to Naomi, and the Marquis Chi Lung hard upon the discovery of the author of the premature disclosure of the loan. He has a fine oriental contempt for women, and considers that Sir Roger can easily buy another wife when the present one is duly shown up.

But, by degrees, he comes to learn that by thus clearing Sir Roger's character he will also destroy his life's happiness; and then—not out of consideration for the wife, but out of devotion to his benefactor's son—Chi Lung takes the disgrace upon himself and declares that *he* divulged the secret, and so repays his debt at the price of his own honour, leaving Sir Roger in ignorance of his wife's lapse. The scene in which he confronts the wife with a slip of paper on which is written, in her husband's handwriting, the name of the spy to whom her mother had sold the secret, is intensely dramatic, and was well-contrived and wonderfully well acted by all concerned in it.

It will readily be gathered that the outstanding character in the play is the Marquis, and right well this character was suited to the finished style of Mr. John Cahill, who looked and acted the part to the life. Alike in his oriental detachment and in his more lofty moments, he invariably struck the right note. Another prominent role, that of Paul Marketel, was well portrayed by Mr. Jack Scott, who assumed the bonhomie of the important man of millions with a dignified ease. A great success, too, was Mr. Sellars, in a happy personification of the lively Frenchman. Armand de Rochecorbon. But what is especially worthy of remark was the general high level of the whole cast. Mr. Pilkington as Sir Roger, Mr. Storr as Billy, Mr. Doust as the Chinese Secretary, and Mr. Gartland as Sir Aylmer Brent, all merit special commendation. Of the ladies, Miss Kathleen Ling well sustained the exacting part of Naomi, who is under duress in the first act and in an agony of remorse throughout the others. It was, perhaps, difficult for her to escape a note of monotony in the somewhat unrelieved atmosphere of trouble in which she lives. Miss Kathleen Emery left nothing to be desired in her rendering of the elder Lady de la Haye, Mrs. Dorothy Smith made the most of the role of Victoria Cresswell and Miss Law was very natural as Lady de la Haye's young ward.

The play was excellently produced and staged, and bore evidences of the meticulous care which had obviously been spent on every detail. The producer, Mr. Julian Mitchell, had a well-deserved ovation from the players at the close.

W. H. G.

REVIEWS.

"*History of Radio Telegraphy and Telephony.*" *Written and illustrated by G. G. Blake, M.I.E.E., F.Inst.P. (Published by Messrs. Chapman and Hall, 11, Henrietta Street, Covent Garden, W.C.2. pp. XIX + 426. Price 25s. net.*

This book was originally published by the Radio Press Ltd., and was reviewed in the April (1927) issue of the *Telegraph and Telephone Journal.* The publication has now been taken over by Messrs. Chapman and Hall, by whom a reprint has been issued. The get up of this reprint is on the same high level as that of the earlier issue, and the book continues to be a valuable work of reference on the development of the art of radio Communication.

"*The Call Indicator System of Automatic Telephony.*" *By A. G. Freestone, of the Engineer-in-Chief's Office, Post Office, London. Pitman & Sons, Ltd., Parker Street, Kingsway, London, W.C.2.* This book deals entirely with the equipment necessary in manual exchanges in a very large city, like the Metropolis, during the transitory period between full manual working and full automatic working. The system is that installed by the Automatic Telephone Manufacturing Company at "B" positions in the manual exchanges of London, so that a subscriber on an automatic exchange can operate a call to a manual exchange in precisely the same way as he does one to another automatic exchange. In this limited sphere the book seems complete; the type is good, the circuit diagrams are clear and easily read; and the volume can be confidently recommended to those having a general knowledge of the principles of automatic telephony, who wish to pursue this important branch of the development.

"*Practical Electrician's Handbook.*" *Editor, H. T. Crewe, M.I.M.E. S. Rentall & Co., Ltd. London. (Proprietors and Publishers, Odhams Press, Ltd. Price 2s. 6d.)*

We welcome the reappearance of this hardy annual, larger and fuller of information than ever. Amongst the additional matter included in the new "Pocket Book" is a section devoted to electricity as applied to marine work, whilst electrical refrigeration is also fully covered in a further section. It contains full information about dynamos, electric lifting magnets, filtering machinery, miners' lamps, searchlights, comparative resistance values, temperature coefficients, of the resistances of metals and alloys, and electrical measurements in general. In fact, it contains useful electrical information of all kinds and there is an excellent little diary included.

RURAL TELEPHONES IN SASKATCHEWAN.

ON May 1, 1927, the total pole mileage of rural telephones in the Province of Saskatchewan reached 59,956, serving 66,830 subscribers, and carrying 202,000 miles of wire. Connected to these rural systems by means of long-distance lines erected by the Government, there are 800 cities, towns, villages and hamlets. Saskatchewan's rural telephone lines are built through the issuing of Rural Telephone debentures. Of total expenditures on the system to May 1, 1927 of $17,227,933 only $8,974,447 then remained unpaid, a remarkable fact considering that 89% of the rural telephone systems have come into existence since the passing of the Telephone Act by the Legislature at the session of 1913-14, and that the building of lines during the war days was handicapped both as to obtaining materials and money. Most of the rural systems are, therefore, only a few years old and on the average are half paid for already.

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BRIGHTON AUTOMATIC TRANSFER: VISITING THE SUBSCRIBERS.

BY GEO. H. CALCOTT, *Asst. Traffic Superintendent, Brighton.*

(*Continued from page* 120.)

Before the subscribers were visited each officer had to satisfy the lecturer that he could perform the duties, and arrangements were made for a telephone to be connected direct to the automatic exchange; an actual demonstration of the working was required to be given to a member of the staff. A note was made of any errors, and the points on which difficulty had been experienced were again gone over with the visiting officers.

Some weeks prior to the transfer a map of Brighton was procured, and the town divided up into districts, an endeavour being made to equalise the number of subscribers in each district. Numerical cards of the subscribers were sorted into district order and subsequently re-sorted into street order. From these were compiled daily lists of 25 subscribers per list.

Each officer was allocated a district as far as possible near his home, and remained on the district until every subscriber who could be visited had been interviewed, thereafter he was required to help in another district until the whole area had been covered.

During the first fortnight no attempt was made to deal with unsuccessful interviews, these were reserved until every subscriber had been called on, then each officer dealt with the difficult cases in his own district until they were either cleared or it was definitely established that the subscriber was away from home.

With a large body of men it would be strange if all were bright and alert, it was therefore not surprising to find one or two individuals who it was necessary to spoon-feed.

The writer vividly recalls an experience in this connexion.

The lecturer had spoken for the first day on the nature of the work and given a brief description of some of the apparatus.

On the second day, before proceeding he asked the class if anyone would like to ask any questions on the previous day's work. "Yes, Sir," replied a diminutive man in the corner, "shall we receive any instructions before we visit the subscribers"!!! What the lecturer said is not recorded.

Visiting the subscribers is an entertaining experience to anyone with a sense of humour as the following anecdotes will show:—

A visiting officer called at a high-class hairdresser's and duly instructed the proprietor in the mysteries of the dial. To demonstrate the various tones it was necessary to put the line over to the automatic exchange. By this time all the customers in the shop had become interested, and gathered round the embarrassed officer, while the proprietor handed the receiver to each customer in turn in order that they might be initiated into the wonders of the "ringing-tone."

Another visiting officer had occasion to call at the house of a Jewish lady, who did not seem to be at all clear as to the method of obtaining calls, eventually after a long and careful demonstration the officer was about to depart when the lady said: "One moment, please. How do I get London?" "You dial 0," replied the visiting officer. "Oh, I see," said the lady; "How do I get Bethnal Green Eye Hospital." Collapse of visiting officer.

One of the men (the slow-witted one referred to previously) thought it was essential to fill in the remarks column on all his forms, and the recording clerk was much amused to read such remarks as the following:—

"Old lady, testy and cross."

"In holding receiver I happened to touch an electric radiator rod—one gets a shock sometimes."

(One could have wished that the shock had sharpened his mental faculties.)

Another visiting officer was demonstrating to a subscriber when there was a loud "rat-tat." When the door was opened, a squad of policemen entered and arrested the subscriber. He is still wondering whether it was collusion between the Department and the police.

Hall Multi-coin boxes are a source of mystification to some people, and the operations of buttons A and B are difficult to grasp. Imagine, however, the feelings of a visiting officer who discovered an old lady endeavouring to obtain 4*d.* change from sixpence, and quite indignant because she was unable to get either a local call or her change.

Just before the exchanges were transferred, the engineers were very busy testing all the switches, and it occasionally happened that a visiting officer, in dialling a test number, was answered by an engineer. This was very embarrassing at times, as the following story shows:—

Scene, in a drawing room of a lady's house in a fashionable part of the town.

Demonstrator instructing lady subscriber in the use of the dial.

Demonstrator: "Now, madam, I will ask you to dial a number which I know is unobtainable, so that you can hear what is called the 'Unobtainable tone.' Now, Madam, lift the receiver and listen for dialling tone, and dial 21901. Now, Madam, that is the unobtainable tone which you hear."

Lady visitor (being ushered into the room by the maid): "Hullo, Mabel; just receiving your lesson?"

Lady Subscriber: "Yes, isn't it simple? Why, when a number is unobtainable, you hear a man's voice say 'Half a mo, Harry, I've just dropped my blanked pliers.'"

VOICE FREQUENCY TELEGRAPHY.

AN interesting if rather lengthy paper was given on this subject at the monthly meeting of the P.O.T. and T. Society on the 20th ult. by W. D. Hamilton, Esq., A.M.I.E.E. (of the E.-in-C.'s Office), at the I.E.E. before an audience, which certainly as regards its size, was hardly worthy of so fascinating a subject. There was some hesitation at first on the part of members to participate in a discussion, partly because of the lack of time which the lecturer had left over, and partly, no doubt, because the technical meal had contained so much mixed nutrition that digestion was necessarily slow. However, Messrs. Bowthorpe, Cohen, Colliver, Symes, A. E. Thompson, and others from among the members and visitors, placed some very thoughtful points of view, both *pro* and *con* before the assembly and the lecturer.

Mr. Symes, for example, cited the success which the system had obtained over the land sections of some of Anglo-German circuits. Mr. Colliver urged the necessity for more clear-cut signals in these days of precision machine telegraphy and asked whether the attenuation faults could not be adjusted.

Mr. Thompson of the International Standard Electric Corporation maintained that it was no good of talking about high speeds, all that was needed was low frequencies, a good multiplex system, and a multiplex for each. Thus with keyboard perforators for multiplex and start-stop systems you could multiplex your multiplex, and could utilise *standard* apparatus at each end instead of umpteen systems.

At this point the writer with no little regret was compelled to leave, and thus is unable to report either the replies of Mr. Hamilton or the encomiums of the patient Chairman, Mr. L. Simon.

J. J. T.

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LONDON TELEPHONE SERVICE NOTES.

Contract Branch News.

THE amount of business done by the Contract Branch during the month of January was as follows:—

	Stations.
New business obtained	9,286
Ceasements	3,696
Net gain ...	5,590

The net gain is 598 more than the figure for January, 1927, and is the second highest on record for the month of January—the record being 5,672, in January, 1926.

It is interesting to know that the new business figures for January this year shows an increase of 224% over the figure for January, 1912, whereas the ceasement figure has only increased by 168% and the increase in the net gain is 276%.

The number of kiosks in London is steadily increasing and now exceeds 800, whilst there are 147 more in course of erection. It was interesting to read the reference to kiosks in Sir Percival Phillips article in the *Daily Mail* on Jan. 24 on the "Changes I see in London" (after an absence of 16 months). His words are worth quoting.

"How long have we yearned for brighter telephone booths. Lots of them dotted about in the most unexpected places, beaming on the night wayfarer like pleasant little lighthouses. I came upon one at the side of a lonely street where sixteen months ago a public telephone was as inaccessible as on Hampstead Heath."

"Heinz Disappearing Hare" was the description shown on a recent directory form—the question is whether a famous advertisement will now have to be altered to 58 Varieties.

Football Notes.

Football is a strange game and the L.T.S. team have contributed in large measure to many of the seasons unexpected results.

Here is the record of the team for the matches played between Jan. 14 and Feb. 11.

Second Round Cup Tie against Taxes, 1st team, away, won 3-2. Ministry of Health, at home, League Match, lost 5-1. Taxes 2nd team, League Match, away, won 11-6. Ministry of Pensions, 3rd Round Cup, at home, lost 4-2.

It is significant that the team's most meritorious performances have been achieved on opponent's ground, and this has been noticeable throughout the season. Evidently the atmosphere of Raynes Park has not the influence that one generally attributes to teams playing on their own ground.

It astonished the critics to learn that the Taxes had been dismissed from the Cup competition on their own ground, and the loss of two points against the Ministry of Health was probably due to the reaction following a strenuous Cup tie only a few days previously.

The win against the Taxes 2nd eleven was a personal triumph for Cowdray, who, from the inside left position, scored 8 goals, which is a League record. The final act in the drama was the defeat at home in the 3rd round of the Cup.

Two things seem to have contributed to the defeat, one was the apparent misfortune in being drawn at home, and the second was due to the failure on the part of the defence to play to the referee's whistle.

Apart from this little more need be said of the match, except that the game was evenly contested, and the luck, which is often an important factor in Cup Ties, favoured the winners.

* * * *

London Telephonists' Society.

On Saturday, Jan. 28, the Annual Dance of the London Telephonists' Society was held at the Bishopsgate Institute, E.C.4. The far-reaching interest felt in this event resulted in a large gathering of members and friends, whose anticipations of pleasure were apparently fully realised.

The Sixth General Meeting of the Society was held on Friday, Feb. 3, in the City of London Y.M.C.A., Aldersgate Street, E.C.4.

World-Wide Recognition

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The very delightful concert was given by members of the staff of Thornton Heath Exchange. A pastoral dance provided great pleasure, not only by reason of its charm, but also its entire freshness. Quaint poems beautifully rendered, together with some splendid pianoforte playing, gained applause, which adequately expressed the appreciation of the audience.

A paper was then read by Miss Pyne, of Victoria Exchange, whose treatment of her subject, "American Woman and Business," made it of absorbing interest.

Various social, political and domestic aspects of American life were mentioned, and anecdotes recounted, to indicate clearly some of the differenc in the lives of normal English and American people.

While in Chicago, Miss Pyne visited a telephone exchange. Her descriptions of some of the operating procedure, and of the conditions under which the work is carried out were of particular interest.

"Is the Social and Welfare Side of Exchange Life Sufficiently Developed?" was the title of the debate which followed. The arguments for and against were very cogently presented by two telephonists from Gerrard Exchange, Miss Binder and Miss Lambert, and an animated discussion arose out of their premises.

The social and sports side of Exchange life, especially, aroused keen argument, but of the welfare side we heard less. We were, however, reminded of the many benefits provided for the staff, and the number of things done to promote health and comfort. A magnificent effort made a few years ago was brought to our notice, when by means of a bazaar, a sum of £2,500 was raised for the benefit of certain hospitals, and a hope was expressed that in the near future, a similar effort might be made.

At the conclusion of the meeting, a vote of thanks was passed to Miss Pyne, Miss Binder and Miss Lambert, and to the ladies from Thornton Heath Exchange, whose concert had been so enjoyable.

GLASGOW TELEPHONE NOTES.

THOSE of us in the Glasgow District—and there are many—who knew him, endorse most cordially the comments of our Newcastle colleagues as to the genial personality and general outstanding characteristics of the late Mr. D. B. Howieson. We had known for some time that he was not enjoying the best of health, but no one suspected that the call was so near at hand. The news cast a gloom over the whole office, particularly in that section with which he had been most actively associated. In very truth, it can be said of our late colleague that:—

"To live in hearts we leave behind
Is not to die."

On Thursday, Jan. 26, the Exchange Staffs held a dance at the "Waldorf" which is situated in the famous Sauchiehall Street of this city. A pleasant evening was spent and the assembled company seemed thoroughly to enjoy themselves. Among those present were Colonel and Mrs. Westbury, Mr. and Mrs. Coombs, and Mr. Johnson; also Misses Cameron and Mortimer of the Central and Douglas Exchanges. The arrangements were in the capable hands of Miss H. B. Mowat and her fellow Committee members, and right well had everything been done. It was the general opinion that these functions were of great assistance, in the sense of members of the staff knowing and appreciating each other from new angles, and the hope was expressed that a further dance on similar lines might be arranged before the end of the season.

Tuesday, Feb. 14, was a red-letter day in the annals of the Traffic Branch, for on that date, Mr. James Robertson, Traffic Superintendent II, attained his 60th birthday, and by the same token put aside his official duties for the new, and not trivial, responsibilities of a "gentleman of leisure." "James," as he is affectionately called by those of us who have been honoured by his personal as well as his official friendship, has a breezy and altogether delightful personality, and his retiral leaves a gap which will be most difficult to fill. Naturally, Mr. Robertson could not be allowed to fold up his tent and steal silently away, though no doubt he would have preferred that type of exit, so a social evening has been arranged by his colleagues, as to which we shall have more to say next month.

This same Feb. 14 witnessed another function, and one in which the Central Exchange Staff was concerned, to wit, a Tea and Concert to the "Boys" who are still resident in the Glasgow Bellahouston War Hospital. The tea was enjoyed by all those present, particularly the special "Hot Pies" which had been provided. The concert consisted of a Pierrot Show by the "Dusky Ten," a group of young Glasgow artists who gladly gave their services. Miss A. F. Cameron, the Central Exchange Officer-in-Charge, presided, and she was supported by Mr. and Mrs. Coombs, Miss Kay (Trunks), Miss Wallace, and other members of the Exchange Staffs. Colonel Westbury was unavoidably absent by reason of indisposition, happily only temporary. Incidentally it strikes the writer, and perhaps it will the reader, that these efforts on behalf of our wounded soldiers and sailors, some ten years after the cessation of hostilities, betoken a wonderful sense of loyalty on the part of the staffs responsible. When the War fever was raging and concerts to our "Boys" were fashionable, the going was easy, but as time passes, recollections fade and enthusiasm is apt to wane, thus making "the going" more difficult. It takes more than these things, however, to damp the ardour of the ladies who, in the main, are responsible for these happy gatherings and the writer is quite sure that the sincere reception and appreciation of their efforts by those who have sacrificed so much for us, carry their own reward. Later on, perhaps, we shall be in a position to indicate just what has been done since the cessation of hostilities. Meantime, Ladies and Gentlemen, please carry on with the good work.

We have just finished another series of Exchange Staff meetings. The general feeling is that much good has been accomplished and that the extra work entailed has been worth while. During the Autumn and Winter months of 1926-1927, no less than fifty-five meetings were held at which matters pertaining to the service were discussed and illustrated in various ways by means of official charts. In the 1927-1928 session a further 49 meetings took place, and while to a certain extent some of the original ground was retraversed, for the most part the discussions and illustrations went a stage further and much new ground was broken. There is wonderful potentiality in these meetings if they are handled and run in the proper spirit. Those of us more directly concerned have great faith in the scheme, and not without reason, but of that more anon.

For some time past an epidemic of marriages has been raging in the Douglas Exchange. On Monday evening, the 13th instant, the Supervisors and Telephonists met over a cup of tea to congratulate Miss M. McCallum, the latest "victim." An enjoyable programme, consisting of music and songs, was followed by tea, and in the course of the evening, Miss Mortimer, the Douglas Exchange Supervisor, presented to Miss McCallum a beautiful canteen of cutlery from the Supervising and Operating staffs, with felicitations to "Pearl" on entering her new life.

On the occasion of his marriage, Mr. J. F. Brodie, Contract Officer, was the recipient, with the good wishes of his colleagues, of a table electric lamp.

Mr. R. F. Forsyth, Contract Officer, was presented with a silver tea service by his colleagues as a token of esteem and regard on the occasion of his marriage.

"J. L."

ON EARLY DUTY.—(*Contributed.*)

ONE morning I went southwards by tram over Jamaica Bridge, and a passing glance gave me a charming aspect of the River. Looking east I saw the lights shine out like fairy lamps and they were reflected sparklingly on the lazily, rippling water. The spires and chimney stacks pierced the grey red sky of the waking day, and the bridge wrapped in the early morning mist seemed like a pathway to "the Other Threshold." I thought how often do we pass such a scene as this without realising its beauty—and went on my way rejoicing in the picture which I knew would be an inspiration all the work-a-day day.

M. H. T.

WE TELEPHONISTS

Ants.

WHY on earth I should write about ants I don't know. You are probably not interested in them and neither am I—or so I believed—but I seem impelled to say something about them. I tried to think of another subject, but so soon as I settled upon one I was conscious of the word "Ants." I saw it without looking, I heard it without listening. I could not free myself either from its sound or its appearance. Sometimes it was written and sometimes printed. It appeared plain and in colours. It whispered and it glimmered, it shouted and it blazed. I dreamed of it when sleeping, I murmured it in waking, and it haunted me from dawn till dark. Nothing was free from its association, and whatever the matter in hand or mind, whatever the circumstance, there was always the persistent sensation of "Ants" as a background, as a complement, or as an enveloping atmosphere. It was intangible and yet it filled the universe. This continued for days—ants, ants, always ants—a monotony of sound and a repetition of sight, until the very word seemed like a haphazard collection of letters, stupidly arranged and without the slightest sense or meaning. Most words appear and sound silly if looked at, and listened to, for long enough.

I referred the problem to a friend, but although his intentions are always good, he is so very literal that I felt from the outset that it would be useless. "To get rid of ants," he said, "pour boiling water on them, or take them to

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the Zoo and give them to the Ant-eater." The more I tried to explain my difficulty to him the more he told me about ants—big ants and little ants, red ants and white ants, blue ants and green ants, flying ants and submarine ants. He said that they were very intelligent and civilised, and lived in highly organised communities. He had once met an ant (or some ants, I forget which) who had eaten a man out of his clothes. It, or they, had taken the man out completely and had just left his clothes standing. His friends only realised that he wasn't inside because his hat was resting on his collar. As they remarked afterwards, "We knew that there must be something wrong, for he never wore his hat like that." On another occasion, when my friend was living abroad, the ants had eaten all his furniture, but Mr. Drage had been very nice about it although it was not strictly covered by the policy. He told me that ants were sometimes confused with the wife of an uncle, but that the confusion was due, as a rule, to dialect and not to appearance. The difference between them was easily discerned. An ant was invariably surrounded by a group of sluggards engaged in complimenting it upon its industry, and anxiously picking up hints on leading a useful life. No one, he said, would ever think of rallying round the wife of an uncle for such a purpose.

He told me a lot more, full of interest, of course, but quite devoid of assistance, so I approached another friend. "Ah, yes," he said, "You are suffering from a repercussive odontoglossum—something like a recurring decimal with spots every so often." This is the most I can remember of his diagnosis. "Tell me," he said, "do you ever find that a particular tune has been running through your head for days on end, so that you cannot forget it or stop it?" "Yes," I said, "I have had that experience." "What do you do about it?" he asked. "Why, nothing, of course," I replied. "Just so," he said, "You wouldn't! What you should do is to exercise your will power. Take hold of that tune and say to it 'This has got to stop!' Then proceed firmly to the music room and sing it right through once, slowly and emphatically. Then tell it to go and never to return unbidden." "Is that effective?" I asked. "An absolutely infallible remedy," he said, "although from what I remember of your voice, your neighbour would probably assist in producing the desired oblivion. Good morning."

His system seems to work, because for the life of me I can't remember what it was I was going to write about this month.

PERCY FLAGE.

Sydenham Exchange.

Miss G. Turner is to be congratulated on the two short plays written and produced by her at the Sydenham Social, Jan. 3, under the titles of "The Registry Office," and "Travelling Abroad." Each play was an unqualified success, and added greatly to the enjoyment of the evening.

May Miss Turner live long and produce many more!

M. A.

Putney Exchange.

On Saturday, Jan. 14, poor children of the Earlsfield district were entertained at Fairlight Hall by the staff of Putney Exchange.

After partaking heavily of tea, the children were delighted to once again see their old friend Mr. Harker in his role of clown.

Then Punch and Judy told their tale, accompanied by enthusiastic yells from the audience, and later whistling, mouth-organ, and singing competitions were held.

A fairy cottage, erected by the engineers, gave a picturesque touch to the hall, and when the entertainment had come to an end, suddenly Grandmother emerged therefrom to water her plants. Along came Red Riding Hood and later Mr. Wolf made his pounce, and the fate of the dear old lady could be heard happening within the cot. Red Riding Hood managed to soothe the fearsome beastie and together they gave presents to all who called at the cottage.

Mention must be made of the excellent little band organised by the staff and of Messrs. MacFarlane & Lang, and Abdulla, for sending novelties.

Altogether, a jolly evening, and an encouragement to a repetition next year.

L. J.

Wimbledon Exchange.

The Staff of the Wimbledon Telephone Exchange gave a party to 130 poor children in the district on Saturday, Jan. 21. At 4 p.m. they sat down to a sumptuous tea to which they did full justice, and there were loud cries of "more jelly; more chocolate biscuits!"

Afterwards they played games and sang choruses, and the latest ragtimes conducted by one of the staff. At a quarter past five they were entertained by a fairy and two friends, who gave character songs and recitations to their great amusement.

Then Father Christmas arrived amid great applause and distributed gifts, helped by the fairy, from the prettily decorated tree. The girls received dolls dressed by the staff and the boys had humming tops, mouth organs, jazz bands, mechanical toys, printing outfits, &c. They also had balloons and bags of sweets which came out of a huge cracker hanging from the ceiling.

After singing "God Save the King" they filed out and each received an apple, an orange, and a bright new penny—and we enjoyed it quite as much as they did.

E. M. B.

Brixton Exchange.

A very enjoyable social evening was spent by the staff in the dining room at Brixton on Wednesday, Jan. 18. A hearty vote of thanks is due to Mr. Townsend, our Service Superintendent, who so kindly acted as M.C., also our Chief Supervisor, Miss Liddell, who did all in her power to make the evening a real success, and Miss F. A. Foster, who with other Supervisors worked hard in arranging everything.

The entertaining part of the programme, i.e. songs and recitations given by our different colleagues, goes to prove that there is some real talent at Brixton, and every item was thoroughly enjoyed. We hope this evening will be the first of a series.

The amount of £11 11*s.* 0*d.* was sent to the Queen's Hospital, Frognal, Sidcup, at Christmas, for additional wireless installation, to add further interest to the lives of those who gave so much for their country in the Great War.

A. C. V.

Tottenham Exchange.

A new swimming club has been organised in connexion with the Tottenham Exchange and is to be known as the Grove Swimming Club.

For the purpose of obtaining funds a Social was held on Dec. 8, 1927. The programme which included songs, recitations, dances, games, and competitions was arranged by the staff, and much talent was shown.

A Christmas Gift stall was a very successful feature of the evening.

Mr. Collins kindly acted as M.C., which role he filled very ably; and the venture was an entire success.

C. PHILLIPS, *Captain.*

A Lament.

Oh, where is our lost Mr. Flage,
Who sparkles on the ladies page;
His absence fills us with alarm,
We trust that he has met no harm.
Our spirits have all sunk to zero,
Fearing the floods have claimed our hero.
Or has our enemy the 'flu
Now marked him as a victim, too;
And doth his eye with fever glow,
Pending a visit from M.O.
Or "Brighter thought," the shops he views,
To catch a bargain for "The News."
Eyes socks and collars at the sale,
Provided for the festive male.
What e'er has happened, let us know,
To leave us is an awful blow.
Come back again to tell the tale
About "The worm," "The shrimp," "The snail."
Come back again with fun and laughter,
And make us happy ever after.

D. D.

We are happy to know that a glance at the first article will reassure our contributor. This month "The Ants" have it.

The Central Xmas Party.

Our Central Xmas party,
On the 17th of Jan.
Was much enjoyed by one and all,
On fun there was no ban.

But the feature of the evening,
Which was greeted with a roar,
Was Central's first dramatic club
Acting "The Bathroom Door."

The latent talent here displayed
Was really good to see;
For budding stars tripped on the stage
And acted splendidly.

Miss Morris who produced the sketch
Acted the gay young beau;
Made love to Prima Donna,
In manner far from slow.

And soon another sketch we'll see,
With the same maidens fair;
The name of it will be "Mere Man,"
I hope you'll all be there.

D. D.

Several articles have had to be held over this month owing to lack of space. They will appear in the April issue.

Contributions to this column should be addressed: THE EDITRESS, "Talk of Many Things," *Telegraph and Telephone Journal*, Secretary's Office, G.P.O. (North), London, E.C.1.

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THE

Telegraph and Telephone Journal.

VOL. XIV. APRIL, 1928. No. 157.

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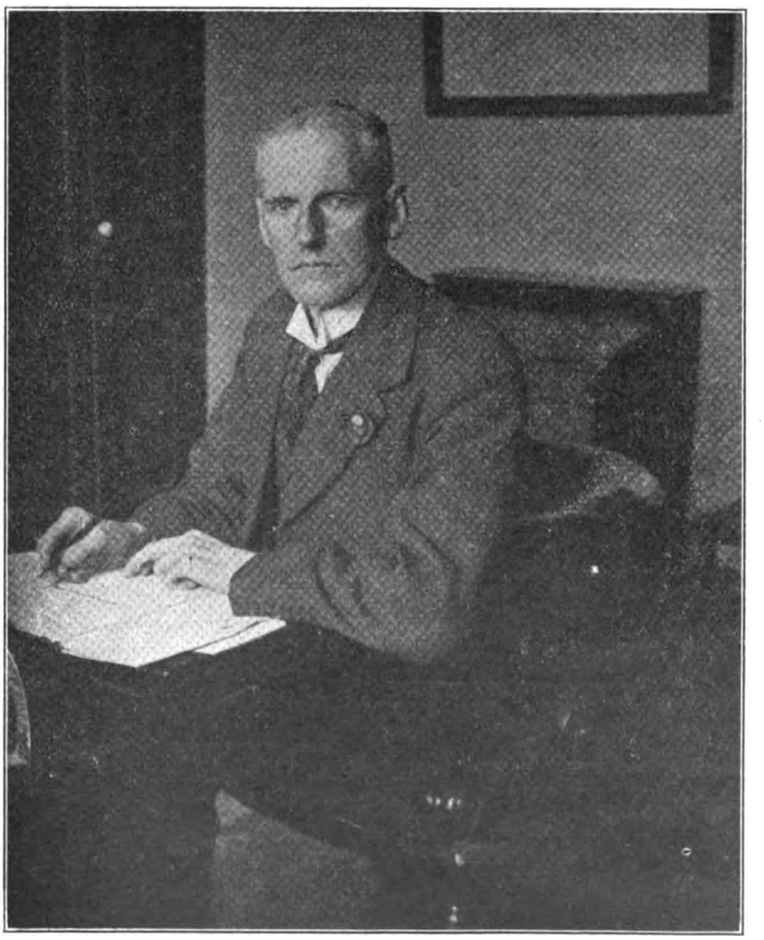
TELEGRAPH AND TELEPHONE MEN AND WOMEN.

LI.

MR. CRAWFORD J. MILLAR.



MR. CRAWFORD J. MILLAR, the District Manager of Telephones at Bristol, has filled a number of important posts in the Telephone Service. Mr. Millar began his career in Glasgow (that nursery of many of our successful business men). After a number of years in the office of the Provincial Superintendent for Scotland he was appointed Assistant District Manager at a difficult period in the history of the National Telephone Company. The Corporation of Glasgow was starting opposition and the Company was hampered by the refusal of the Municipal body to grant underground facilities. A strenuous period of service was ended when the Corporation gave up the fight, and its system was acquired by the Post Office.

At the transfer to the State he was Manager of the West Scotland District, stationed at Glasgow, but served during 1912 in London on the Metropolitan development study. Since then he has been District Manager at Exeter, Edinburgh and Gloucester, and at the end of 1921 was transferred to Bristol.

Mr. Millar has done good work at Bristol and the district has been much extended during his period of office.

A man of attractive personality, tactful and possessing literary ability of a high order, he has endeared himself to all who know him by his courage, loyalty and devotion to duty.

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RECOVERING THE WASTE.

BY E. J. JOHNSON, *Glasgow.*

IN industrial operations there is a certain percentage of waste and the reduction of this to the smallest possible amount frequently has a decided effect on the profitableness or otherwise of the concern. In the manipulation of telephone traffic there is wastage, represented by lost or ineffective calls. Unfortunately these cannot altogether be avoided, but anything which can be done to reduce them is so much waste recovered and is therefore all to the good.

What does the average telephone subscriber require his telephone for? In the great majority of cases to obtain rapid communication with the person he wants at the moment. In other cases it is desired that there be uninterrupted facilities for incoming calls. One of the measures of the efficiency of the telephone service is, therefore, the proportion of calls which are immediately effective out of the number required. This being the case the percentage of effective traffic is a very important factor in the telephone service to both classes of telephone user. Given a reasonably efficient telephone service, improvement can only be made by attacking the waste operating products, in other words, the lost calls. Any reduction in the number of these is, therefore, an asset to the administration and to the user.

Observation of the service tells us that there are such things as lost or ineffective calls, subscribers' reports confirm and at times hammer home the feeling that they are there in quantity, and cause unnecessary annoyance, which should be removed.

The main items of ineffective service which make up the total of lost calls are as follows:—

Number Engaged;
No Reply;
Wrong Number;
Miscellaneous; (that is such items as Cut Off, Third Subscriber connected, Junction Engaged, &c.).

For many years effort has been concentrated on improvement from within, until a saturation point was reached, or in other words the proportion of effective calls remained stationary. When attempting to prevent waste it is usually best to tackle the biggest items first, and as "Number Engaged" is the cause of the greatest loss, this requires early and vigorous treatment by tracing overloaded lines and filtering the calls passed over them. The particulars so obtained are usually sufficient to convince the subscriber that he is losing business, and that it is in his interest to increase his installation.

A campaign on these lines has been in force at Glasgow for some time with gratifying results, as shown by the reduction in the percentage of calls lost because of Number Engaged, indicated by the six monthly averages of the service observation figures given below:—

1926.		1927.	
Jan. to June.	*July to Dec.*	*Jan. to June.*	*July to Dec.*
10.2	9.5	9.0	8.5

It might be suggested that the reduction is due to a fall in the calling rate, but this is not so as there has been a slight rise, the average for all the exchanges under observation being 5.8 for 1926 and 5.9 for 1927.

To secure a reduction as shown by these figures demands steady and persistent efforts on the part of the Supervisors in the Exchanges and members of the Contract and Traffic staffs.

As the known busy lines are disposed of it will be necessary to take preliminary records of engaged traffic on all lines in the Exchanges, and so make certain that no single line or group of lines is overloaded. When a stable figure has been obtained it will still be necessary to keep the subject in mind, as the growth of business may in a few months cause a subscriber's installation to be insufficient to properly carry his traffic. It will not, of course, be possible to entirely do away with loss from this cause, as occasions arise when even lightly loaded lines are engaged when required for another call, but it should be possible to reduce the figure to 8 or even 7%.

The responsibility for loss of efficiency from this cause is a joint concern, shared by the administration and the subscriber, but until the condition of affairs has been pointed out to the subscriber the administration should take the greater portion of the blame. After the subscriber has been advised, the responsibility for losing calls, or causing trouble to his clients is his.

The next item of waste, in order of numerical importance, is that due to "No Reply" on the part of the subscriber. To receive the intimation "No Reply" is a disappointing and irritating experience for which the subscriber is almost always responsible. On the other hand the administration might give the subscriber the benefit of its experience and offer expert advice, particularly in those cases where the subscriber wishes his telephone placed in a position which is not favourable to a quick answer being given at all times, or where the bell cannot be heard all over the house or office.

From an analysis of over 5,000 cases of "No Reply" it appears that the chief reasons for failure to answer are due to (1) the wanted subscriber being out; (2) not hearing the bell; (3) not being able to answer before the connexion is cleared; and, in a few cases, (4) faulty apparatus.

Many subscribers require education on the importance of smart attention to telephone calls; this is best accomplished by visiting and pointing out the trouble caused to clients. Tactful suggestions as to possible improvements which can be effected by the provision of suitable apparatus and its manipulation are usually gladly accepted and improvement results.

There are, however, certain classes of subscribers who are not particularly anxious about their incoming calls, and so long as their outgoing calls are satisfactory do not desire any improvement. Trouble will also be given by the one person or other office, which is frequently closed.

If it were not that Directory space is so valuable, an intimation of the hours of business in these and other appropriate cases might be an advantage. Houses are frequently closed for long or short periods and shops &c. during meal times, and there are also calls made outside ordinary business hours. These and similar cases make it impossible to do away entirely with the trouble, but there is little doubt but that it can, and should be, reduced.

An experimental trial of the visitation of subscribers has been in force for a few months in this District, but sufficient time has not elapsed on which to base a definite opinion as to the permanency of the result.

The following comparison of figures are of interest as showing what improvement is possible:—

PERCENTAGE OF CALLS LOST THROUGH "NO REPLY":—

	1926. *Before Visiting was tried.*	1927. *Visiting in Progress.*	*Improvement.*
October ...	2.0	1.8	0.2
November ...	1.6	1.0	0.6
December ...	2.9	1.8	1.1

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The progressive improvement indicates that the advice to the subscriber is having the desired effect and that if kept up for a considerable time will be productive of good results.

Another source of waste is caused by Wrong Numbers, and from recent investigations it appears that the subscriber and the administration are about equally responsible. Phonetic similarity of numbers, indistinct speaking, and switching errors are the chief reasons for this trouble.

The proportion of calls lost from this cause is in the neighbourhood of 1½% and should be capable of reduction. The subject is, however, an elusive one and demands further study and attention before it is safe to say much about the possibilities of reducing the trouble. It is considered that about 1% is a reasonable figure for Manual Exchanges. A point to remember is that one of these errors annoys two persons—the person calling and the person called.

A number of calls are lost from various miscellaneous causes, that is such as Cut Off, Third Subscriber connected, Junction Engaged, &c. The administration may be said to be responsible for practically all of these causes. Individually they are of comparatively small account as the percentages are fractional, but at the same time they are tiresome items of the service and require watching and curing if possible.

When a telephone service is reasonably efficient further improvement can only be made by careful attention to minute details and progress is relatively slow.

The following figures show what has been done in the face of very considerable difficulty. They are the average of the service observation percentages of calls effective on the first application for periods of six months and are :—

HALF-YEAR ENDING :—

June, 1926.	*Dec.*, 1926.	*June*, 1927.	*Dec.*, 1927.
86.0%	86.2%	87.3%	87.5%

an increased percentage of 1.5. This does not look much, but it means that on a daily traffic of 200,000 calls 3,000 more are completed with the same labour, or number of switchings as formerly. In terms of money value, a waste operating effort costing approximately £6 5*s*. 0*d*. is transformed into an immediate revenue value of £12 10*s*. 0*d*.

This phase of the efficiency of the service affects Automatic systems in much the same way as Manual systems, with the exception that ineffective machine switching operations will probably not be so costly as Manual, but the incentive of an efficient service to the user is worth a great deal, as the greater the efficiency the greater the use made of the service, with corresponding advantages to the revenue.

Is not the success of a telephone service dependent on its time-saving qualities ? The user is not concerned as to where the loss of time is, he wants his message to get there, and it is up to the administration to remove all possible obstacles and so prevent loss of time to the user from such causes as Number Engaged, No Reply, Wrong Number, Junction Engaged, &c., in addition to providing for prompt answer to calls and efficient switching. It is suggested that 90% of calls effective on the first application is a possible standard which should be satisfactory all round, and which should be obtainable without undue expense to subscriber or the administration.

These notes deal only with the waste in delivering the finished product, that is, the effective call. Doubtless there are other phases of waste which are deserving of consideration, and these notes may suggest a theme for an article in the *Journal* to someone who has been making investigations and so bring them into the open and add interest to the "Telephone" Section of the *Telegraph and Telephone Journal*.

SPAIN'S NEW TELEPHONE SYSTEM.

BY MAURICE K. MCGRATH.
(*Assistant Vice-President, International Standard Electric Corporation*).

(Reproduced from *Foreign Trade* to which we are indebted for permission to use the illustrations.)

WITH the introduction of electrical communications into the game of commerce, Spain registered the same interest as the other European nations in the development of the various methods that were invented. But like a majority of her neighbours, she placed the telegraph and the telephone in the custody of the Government.

In the case of the telephone, there grew up in the course of time a mixed service, partly government-operated, and partly in the hands of private concessionaires, who were faced with the prospect of turning over their properties to the Government at the expiration of fixed periods. The long-distance lines were partly in the hands of the Government and partly owned and operated by private concessionaires who operated, among other things, the local services of the two principal cities, Madrid and Barcelona, where were to be found more than a fourth of all the telephones in Spain.

Some of the telephone service, both local and inter-urban, was owned and operated by provincial governments. There existed numerous small municipal local telephone plants. Also there was a variety of small local concessionaires. In the central government, the telegraph and the telephone were administered in the same department. Many towns had the telegraph and the telephone stations in the same office, many other towns had one service but not the other, and there was a vast number of communities that had neither

The development of a telephone system is an expensive proposition. It is well known that governments generally have experienced difficulty in providing adequate appropriations to build up and keep up the telephone service, because of the many other demands upon their treasuries. For a small municipal government, this problem becomes immeasurably greater. A small private concessionaire does not have the access to the money markets, an opportunity to make his appeal widely heard, or sufficient actual or potential revenue.

In Spain, the result was that the telephone service, while pretty good in some spots, was decidedly bad in many others, and did not exist as a practical nation-wide network of communications. There were many different types of materials and equipment. Much that was obsolete still continued in use. Apparatus that long since had passed its heyday struggled on in the losing fight to transmit the human voice intelligibly. Lines in many places were decrepit. Some circuits were of copper, some of iron, and others that consisted of the two metals of decidedly different conductivity, placed in parallel.

There was no uniformity or standardisation of equipment, materials or practices. Even in Madrid, there were two distinct types of telephones in service, the common battery and the local battery, and there were scores of different makes throughout the country. Switchboards frequently consisted of several positions of distinct epochs in the progress of the telephone science, and produced by different manufacturers. One might have found in Spain examples of almost anything and everything that had ever been used in the telephone industry anywhere.

In several places, the switchboards were so old that the operators had to work standing up as was the practice in the early days of Alexander Graham Bell in Boston, carrying long cords from one part of the room to another, and shouting the numbers back and forth to each other. In one city, there were three distinct methods of ringing, and each operator had to remember what type of telephone each subscriber had, in order to call him. Directories were published by private concessionaires, who exploited them for advertising purposes, got them out whenever it appeared most profitable, and paid no serious attention to the accuracy or practicability of the books. The Madrid directory was published in Barcelona, and the Barcelona book in Madrid.

All of this added to the cost and other difficulties of maintenance. In fairness it must be said that there was also some efficient modern equipment in service, but it does not require a technically-trained mind to appreciate that it was not practicable to make the two classes work together harmoniously. The subscriber who was lucky enough to be served by up-to-date equipment suffered nevertheless from the bad equipment that served the person he wanted to call.

Subscribers were allowed to own their telephones and private switchboards. Hence many bought second-hand equipment that was not properly conditioned, others bought solely with an eye to the cheapness, and generally they kept this apparatus in service long after it should have been retired.

Insulations had rotted away, especially where exposed to the weather. There were electrical leakages and the induction, cross-talk and all the other ailments that contribute to make telephone conversations inaudible or drown them out with other noises.

Switchboards were over-congested. Local service was slow and noisy, and long distance service much worse in both respects. There were waiting lists years old of persons who had applied to have telephones installed. In

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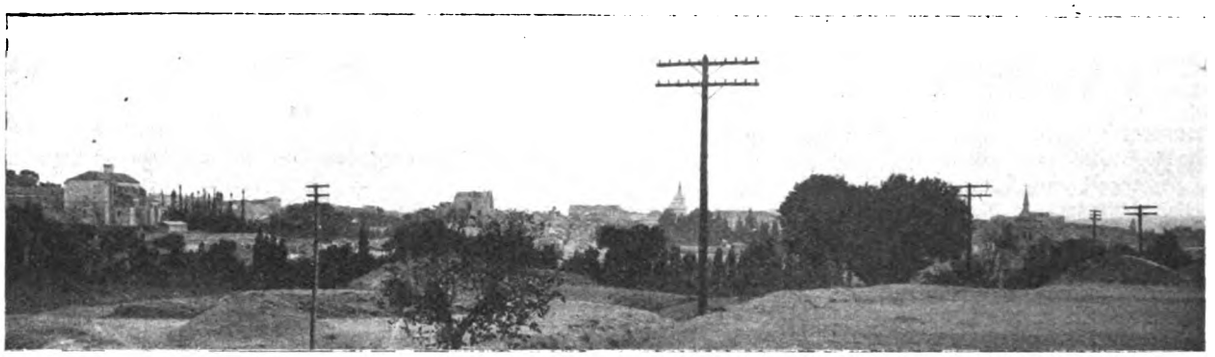


The Madrid-Zaragoza telephone line entering Guadalajara.

a majority of cases, a subscriber could not make a long-distance call from his own telephone, but had to go to the public telephone office and wait for hours in the uncertain hope of getting a connexion, or make an appointment to come back later, probably the next day. All of the principal arteries of long-distance communication were overcrowded, and during the better hours of the day they were held on a contract basis by important and frequent users, such as newspapers, banks and brokers. To talk from one end of the country to the other was absolutely out of the question.

Such was the situation when, in August, 1924, the Spanish Government, after a painstaking study of the problem, and actuated by a determination to provide the country with a complete, up-to-the-minute telephone service such as her commercial and industrial importance and aspirations deserved, entered into a contract with the newly organised Compania Telefonica Nacional de Espana allowing it to buy, operate and develop all of the various telephone services in Spain, including that of the central Government itself. This contract placed upon the Company the definite obligation to accomplish in five years the very sizable task of completely reorganising and rebuilding the entire telephone service, extending it to hitherto neglected points, and making it equal in quality to any in the world.

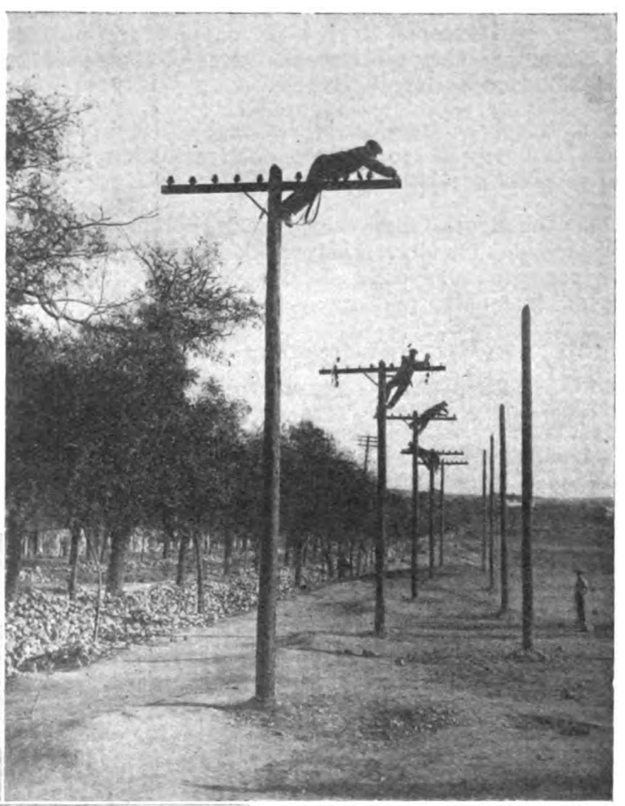
The Company obligated itself to favour local industry to the extent of buying all materials and equipment possible in Spain, provided the prices were not more than ten per cent. higher than in the foreign market, and of doing whatever it could practicably to encourage Spanish industry to supply its needs.

This last-named agreement called for a sweeping survey of the national industry, followed by a campaign to put at the disposition of Spanish manufacturers the specifications and samples of the materials, tools and equipment that would be required. Information was given regarding the extent to which these things would be needed, quantities and times of delivery and everything else that would assist manufacturers in preparing to bid and to make good subsequently on their orders.

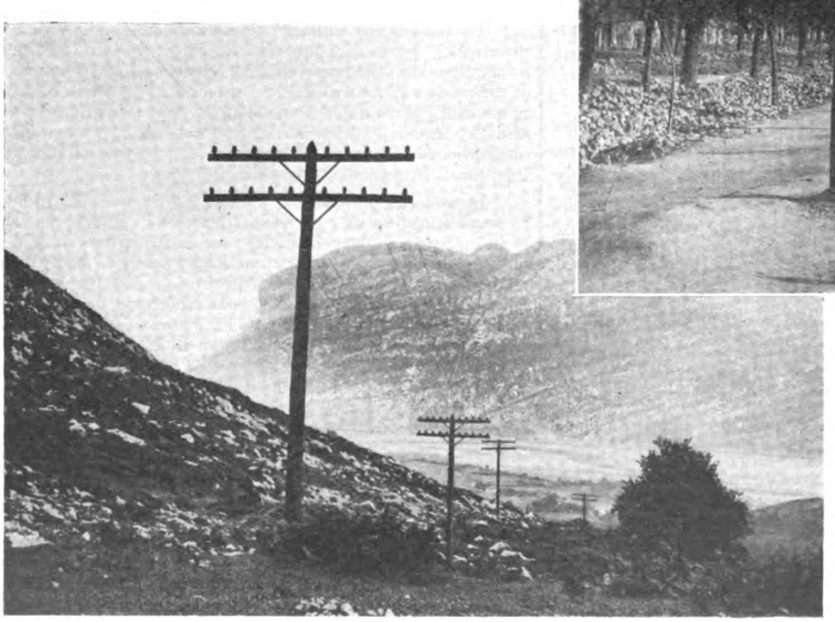
While many of the things wanted were already being produced in Spain, it was found generally true that the supply was not up to the additional demand that the new Company and its big job had created over night. A great many other things on the list were not being produced in Spain, but the investigation showed that there was raw material and the potential possibility of creating national production in these lines.

Assured of this new market, manufacturers enlarged their plants, or added departments or features to their organisations. New plants came into existence. The wheels of industry quickened perceptibly from one end of Spain to the other, for the demands were large and varied.

Although Spain is Europe's first copper producer, it should not be difficult to realise that her production of this metal, which had suffered a set-back at the close of the World War, took a jump when the telephone company set about to tear down all the old iron wire and string only copper



A school for telephone linemen, established in Madrid to train the Spanish construction gangs.



The telephone line from Santander to Bilbao passing through the rugged Mountains of Vizcaya. From Bilbao there is a prolongation to San Sebastian, where it connects with the Madrid-Paris line, thus providing communication between France and all the north coast of Spain.

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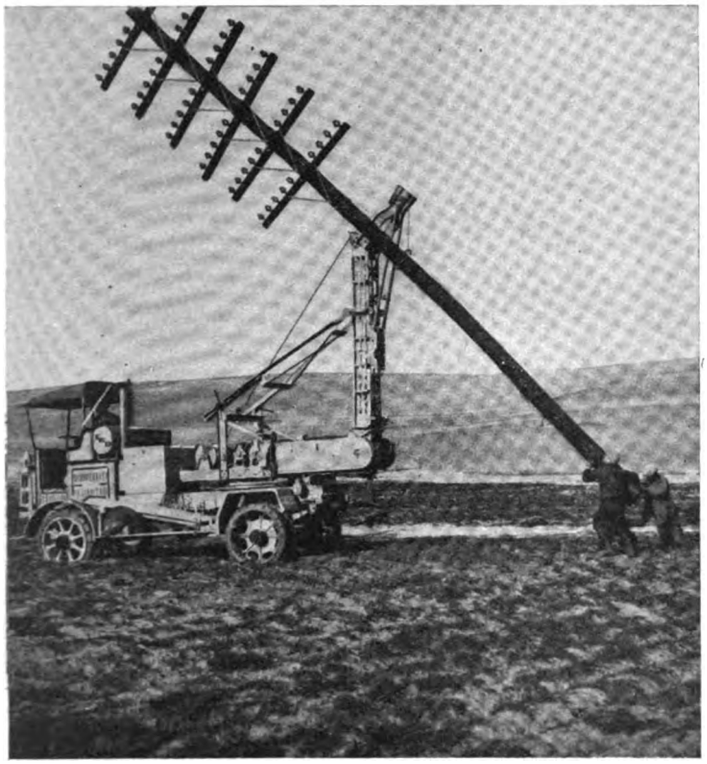
from the Straits of Gibraltar to the Bay of Biscay and from the Levantine shore to the Portuguese frontier. For not only were all the old lines rebuilt from the ground up and the number of circuits increased, but a vast system of new highways of speech were laid out across the map of Spain.



Modern methods of rapid telephone construction in Spain. This American four-wheel-drive machine bores the post hole with a great auger and then plants the pole with the aid of two men.

The new programme also meant prosperity for the woodsmen of the Pyrenees for the plans called for new poles throughout the nation, and the specifications for a much sturdier type of pole than any in use.

New buildings were to be constructed throughout the land, ranging from the immense headquarters and automatic central office, Spain's "Woolworth building," on the Gran Via of Madrid, down to modest two-storey structures on the principal streets of small provincial capitals. That feature of the programme touched a different group of national producers: the iron-masters, the quarrymen, the brick makers, the lumbermen, the cement manufacturers, the glaziers, the cabinet makers, the plumbing outfitters and all the rest.

There were cables to be bought in tremendous quantities, underground conduits, tools galore, motor transportation, furniture, messenger cables, insulated wires, batteries, to say nothing of the more technical requirements of the enterprise, such as telephones, automatic equipment and switchboards.

Of course, much of this demand was of an emergency and temporary nature, but nevertheless the creation of a full-sized and progressive telephone system on a real nation-wide scale meant a certain new and permanent market for all of these things.

Some early orders had to be placed outside Spain, for supplies that did not exist there, or that were not yet being produced in sufficient quantities, but Spanish producers were given the benefit of as large a slice of the orders as they could handle. With this encouragement, production in those lines began to register immediate growth, until to-day there remain very few things that the telephone company cannot buy in the home market.

There was some manufacture of lead-covered cables in Spain, but not enough to meet the rush requirements of the big task. There was also some manufacture of telephones of a suitable model, as well as small switchboards, cords, and various parts. There was, however, no manufacture of automatic central office equipment and supplies.

As the contract called for the establishment of automatic service in seventeen cities within five years to which list the Company graciously added three more cities, and as the production of that sort of highly scientific and exact machinery calls for specialised factory organisation, including equipment and personnel, of a nature that demands time for development, the first orders for automatic went abroad.

However, inspired by a sure and active market, there was organised in Madrid in 1925 a company for the manufacture of all sorts of telephone supplies, including automatic equipment, known as the Standard Electrica, S. A., associated with the International Standard Electric Corporation, owner of numerous telephone patents of the utmost importance. This company was headed by the Duke of Alba and Berwick, as president, and a group of leading Spanish bankers, together with certain American technical experts.

The Standard Electrica, S. A. took over the Barcelona factory of the Telefonos Bell, S. A., originally a subsidiary of the International Western Electric Company, and a small factory of electrical supplies in Madrid; but it set about at once to build two large new factories. One, for the manufacture of telephone cables and cords in Santander for domestic and export consumption, was inaugurated on Aug. 25, 1927, by King Alfonso, and started off on a full production basis the next day. The other, for the manufacture of Rotary automatic equipment and other telephone mechanisms, is being built in Madrid alongside the smaller one, and is nearly ready to start production with a previously trained personnel.

So much for the direct influence on the commercial life of Spain produced by the construction of the new telephone system. It is obvious that to put so much money in circulation in a constructive undertaking has had a further influence in augmenting the public buying power, which has inevitably stimulated both domestic and foreign trade.

More indirectly, perhaps, but no less certainly, the creation of an extensive and efficient telephone service has assisted powerfully in the commercial and industrial progress of the nation in all lines. This is an influence that is destined to become greater year by year as the telephone habit grows among a people who heretofore have had to get along the best way they could without it.

To-day, the telephone service between Madrid and Barcelona, for example, is almost as rapid as local service. The average connexion is

Telephone engineers inspecting the telephone line built in 1925 into the valley of Aran at the foot of the Spanish Pyrenees to bring communications to a rich but hitherto isolated district.

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made in less than five minutes, and frequently it is more a matter of seconds. Service on all the principal lines is on an average basis of less than ten minutes, and the majority come within the five-minute class. It is thoroughly practicable and convenient to talk from one extremity of the peninsular to the other.

If a ship puts in at Gibraltar, the captain can, to-day, get in quick communication with a shipper or an agent in Bilbao, Santander, Vigo or Coruna on the north coast, Cadiz, Malaga or Almeria on the south, or Alicante, Valencia or Barcelona on the east. A tourist in San Sebastian can make his hotel reservations in Sevilla by telephone. An olive oil producer in Jaen, in the south, can keep in touch with the market in Barcelona and make his sale by telephone. Merchants can direct the operations of their travelling salesmen or agents throughout the country, or solicit the trade directly by telephone. In fact, the uses of the telephone in business life in Spain are now as multiple and beneficial as in the United States.

But the benefits of the telephone for the Spanish public are not to be restricted to the limits of their own kingdom. Lines are now being completed that will connect with the new line the Portuguese government is extending from Lisbon to the frontier, and shortly there will be direct international service from the Spanish capital to that of the neighbour republic on the west.

Landing the submarine telephone cable that unites Africa with Europe on the beach at Algeciras. The Rock of Gibraltar may be seen in the background.

Vast improvement has been made, and others are now nearing completion, in the international service between Spain and France. The French Government is completing additional circuits to Irun, and very shortly better facilities are promised over the Paris-Madrid line. Arrangements have been made to extend the service from Madrid to London via Paris, and it is hoped that this will be an accomplished fact in the early part of 1928.

King Alfonso XIII inaugurating the automatic telephone service in Madrid, 29 Dec., 1926. Facing the King with one hand on the table, is the Marqués de Urquijo, president of the Compania Telefonica Nacional de Espana and a director of the International Telephone and Telegraph Corporation.

The next great step will be to flash the greetings of Spain across the Atlantic to the New World that her navigators discovered. Then Commercial telephone service will be a reality from every part of Spain to the subscribers of the Bell System in the United States and Canada, and those of the associated companies of the International Telephone and Telegraph Corporation in Cuba and Mexico.

The development has not been limited to the inter-urban service, or the joys of telephoning in comfort to him whose interests lie afar. The change to automatic service has already been accomplished in five cities, including Madrid, the type of equipment being the Rotary, the same which the French Government has also adopted for Paris. Work is under way to give automatic service to fifteen other cities before the autumn of 1929.

In smaller towns, the local telephone service has been reorganised or completely reconstructed. In hundreds of communities that had only long-distance service local systems have been installed, and up to the middle of last October, 499 towns had been connected to the service which previously had been completely isolated telephonically.

Even in the larger cities that eventually are to have automatic service, the manual service has been enlarged and improved generally to take care of the public needs provisionally until the permanent change can be realised.

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In Madrid, for example, one new manual exchange was built to relieve the desperate congestion in the down-town area for a year, pending the completion of the new automatic plant.

Underground cables are being substituted for over-head wires and cables in all the more important cities as a part of the reform of the local service. This work is planned with an eye to the future, so that more cables can be put into service as the growing demands for service require, without the necessity of digging up the streets again, at least within the present generation.

The underground cable plant and the complete new automatic service throughout the city of Madrid were inaugurated on Dec. 29, 1926, by King Alfonso XIII. On the same occasion, His Majesty broke the European long-distance telephone record, speaking over a circuit 3,800 kilometres long from Madrid to Coruna via the four corners of his Kingdom.

This circuit took in Ceuta, in the Spanish protectorate of Morocco, by means of a submarine cable that was laid from Algeciras, Spain, to Africa four months after the signing of the contract with the Compania Telefonica Nacional de Espana. This was the first spectacular achievement of the new Company, although, as a matter of fact, telephonic communications had been established a month previously between Madrid and Tetuan, the Spanish military headquarters in Morocco, by the installation of emergency repeaters, the extension of the southern trunk line to Algeciras, and the ingenious application of a government telegraph cable to telephone uses by the engineers of the International Telephone and Telegraph Corporation, who are the technical advisers of the Compania Telefonica Nacional de Espana, and who have directed the construction programme.

That the telephone is really being used in the business life of Spain is indicated by the fact that the Company is now handling more than 5,000,000 long-distance calls a year and more than 3,400,000 *telefonemas*, which are written messages transmitted verbally. The number of long-distance telephone calls made in Spain last September showed an increase of 27% over the figure for the corresponding month of the previous year. Some of these calls are social, but the great majority are of a business character.

The Spanish press depends almost entirely upon the telephone for its news. Not only do reporters use the telephone on their daily rounds as they do in the United States, but nearly all of the out-of-town news is transmitted by telephone. There is no great general press association in Spain in any way similar to the Associated Press, but each newspaper has its staff of correspondents who send in *telefonemas* or more generally dictate their news over the long-distance telephone.

Madrid, being the capital, is the most important news centre. It is also, curiously enough, the exact geographical centre of the peninsula. The result is that the telephone system has been developed roughly in the form of a wheel, with Madrid as the hub, and lines extending from it in all directions to important coast cities, which are united by lines that skirt the coasts and frontiers, and are comparable to the rim of the wheel.

This is a notable advantage not only for the Madrid newspapers in harvesting news from the rest of the country, but also for the army of correspondents who live in the capital and talk daily with the string of papers, large and small, which they represent. In the business and official centre of Madrid, the Company has fitted up a species of club as headquarters for the correspondents, where they may collect and prepare their items, and transmit them from specially constructed booths.

One of the most difficult and spectacular news stunts that the Company is called upon to handle in this way is the transmission of the lucky numbers in the drawing of the Christmas lottery. The interest in the results is nation-wide and most intense, and the rivalry among the correspondents is keen. The drawing begins at 9 a.m. in the Mint. As each number winning a prize is drawn, it is telephoned immediately to the press room in the telephone office, where the correspondents relay the information to their respective newspapers.

Of course, only the largest newspapers care to take the entire list in this way, but every newspaper is interested in the principal prizes, and in all prizes that fall to their respective localities. The drawing lasts about four hours, and often some of the big prizes, even the capital one of 15 million pesetas, do not appear until near the end. Then it is a race to see who can get the first extra on the streets. There used to be tremendous outcries in the newspapers over the slowness or the complete failure in the transmission of the list, but last Christmas it reached the farthermost corners of Spain without the least delay.

The authorised capital of the Compania Telefonica Nacional de Espana is 600,000,000 pesetas of common stock and 600,000,000 pesetas of 7% preferred. Of this, 50,000,000 pesetas in common stock and 200,000,000 in preferred is actually in circulation. The preferred issues have all been absorbed quickly in the Spanish market.

The president of the Company is the Marqués de Urquijo, head of the chain of banks which bear his name, and one of the foremost industrial figures in Spain. He has associated with him on the board a select group of Spanish financiers and several of the chiefs of the International Telephone and Telegraph Corporation.

There are in round number 11,000 employees, virtually all Spanish, and the majority of them former employees of the old telephone systems that were purchased by the new Company. There are a few technically expert Americans and other foreigners, mostly retained in a temporary capacity for the training of the personnel and the completion of the big construction job.

A school has been established by the company in Madrid, available to all the personnel, where regular courses are given in all subjects affecting the work of the company, from the Three R's up to office work and electrical engineering.

In this school, among the many students who have passed through, it is worthy of note that every cable splicer who has worked on the construction of the underground systems of Madrid, Barcelona and the many other cities, received his entire training from the ground up here under Company teachers, for cable splicing was an unknown trade in Spain before the new telephone organisation came into being. Here, too, were trained the linemen who built the new long distance plant; and here the telephone operators of Madrid, whose old jobs died the night the automatic came to life, have been trained for new jobs in the Company.

THE C.T.O. LIBRARY.

THIS admirable institution, so enthusiastically and efficiently organised and managed, celebrates its fortieth birthday during the present year, and the satisfaction expressed in the Committee's Annual Report for the year ended December, 1927, is fully justified.

Figures, it is said, may be induced to prove anything, but the straightforward figures as given in this report attest their own truth thus:—

Quarterly subscriptions have advanced from £64 13*s.* 0*d.* to £72 15*s.* 6*d.*, and the total for the year shows an increase of £41 9*s.* 6*d.* over that of 1926.

The rise in income has been maintained for 32 consecutive quarters, the figures in the first quarter of 1925 being £43 14*s.* 0*d.*, and in the last quarter of 1927, £72 15*s.* 6*d.* The yearly income is now £270 13*s.* 0*d.*

The quarterly totals for membership during the same period have risen from 484 in the first quarter of 1925 to 803 in the last quarter of 1927.

The membership, which for the December period numbered 803, is analysed thus: 548 men and 255 women; representing 1,093 fully paid shares.

As a result of the increasing membership, the number of books issued has steadily risen, and the totals from 1920 are as follows:—

1920	14,774	1924	26,173
1921	18,489	1925	32,466
1922	20,720	1926	42,781
1923	23,881	1927	51,698

Deducting closed periods for stocktaking and public holidays, the total for 1927 thus gives a weekly issue of well over one thousand books.

The Committee make gracious recognition of the friendly and practical assistance of the ex-Controller, Mr. John Lee, and gratefully place on record the valuable help of their late and much esteemed President.

Under the most friendly ægis of Mr. J. Stuart Jones, Mr. Lee's equally interested and sympathetic successor, not forgetting that hard-working Librarian, Mr. A. Pethurst, there is every hope that the close of the fourth decade behind this self-supporting, staff-controlled C.T.O. amenity will see the attainment of yet greater achievements.

Due acknowledgment is given to the score or so of donors from whom additions to the library have been received during the year, for the voluntary assistance of certain members during the strenuous stocktaking period, and last, but not least, to the Controlling and Superintending officers and to the members for their most loyal support. J. J. T.

OBITUARY.

MR. W. W. GOULD, GLOUCESTER.

WITH deep regret we announce the death of Mr. W. W. Gould, Clerical Officer with allowance, Gloucester District Manager's Office, who, after a long and trying illness, borne with fortitude, passed away on Feb. 5 last. By his death the Department has lost a zealous officer.

During his service at Gloucester, Mr. Gould had earned the confidence of all members of the staff who feel very keenly the loss of a respected colleague.

Mr. Gould was well known in the Midlands where 14 years of his official career were spent. He entered the service of the National Telephone Company at Wolverhampton in 1899, and was transferred to the service of the Post Office on Jan. 1, 1912.

Prior to the transfer of the National Telephone Company's system to the Post Office, he served on the Inventory Staff.

In October, 1912, when the Wolverhampton District Office was closed, Mr. Gould was transferred to the Birmingham District Manager's Office, and a year later was promoted to the rank of Overseer at Gloucester.

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TELEGRAPHIC MEMORABILIA.

AUSTRALIA.—Reuter's Canberra agency states that the report of the Australian Postmaster-General for the year 1926-27 shows a loss of £172,000, as compared with a loss of £285,000 in the previous year. During the year international messages containing 4,418,000 words were dispatched *via* the Pacific cable and 3,940,000 words were received, yielding a revenue of £66,000, as compared with £72,000 in the previous year. Over the Eastern Extension cable messages containing 5,533,000 words were dispatched and 5,645,000 words were received, yielding a revenue of £114,000, as compared with £121,000 in the previous year. From the inauguration of the "beam" wireless service on April 8, 1927, to June 30, 1927, 760,000 words were sent from Australia and 571,000 received. The report adds that because of its high speed, great capacity, and other considerations this service has materially strengthened the chain of Empire communications.

The Canberra correspondent of the *Daily Telegraph* also reports that Senator Thomas, on Mar. 9, moved a resolution that plain language messages by "beam" wireless should be charged at 1*d.* per word. He said that at this rate the traffic would increase to 50,000,000 words annually, which would yield a revenue of £208,000. As the company paid £8,000 in the expenses of running the traffic, there was no reason why with a penny a word it should not make ends meet. If necessary, the Government should take over the business. The debate was adjourned.

In the same report of the P.M.G. of Australia it is also recorded that during the period mentioned there were 225,000 wireless licences in force, of which 119,000 were in Victoria. The total fees amounted to £307,000.

Reuter's Trade Service, Melbourne, adds the interesting information that it is understood that the Postmaster-General's Department is endeavouring to persuade the private broadcasting companies in Australia to co-operate with the object of saving unnecessary expenditure and improving the broadcasting services all round. The Department thinks it possible, by effective co-operation, to save £30,000, which might put non-paying stations on a sound basis. The suggestion for co-operation came originally from the Royal Commission on Wireless, which discovered an unequal state of affairs in the relations of stations in the Commonwealth. The Commission suggested that the revenue of all stations be pooled and that £5,000 operating expenses be paid annually to each station.

The same agency also informs us that a Roman Catholic broadcasting station established at the Eucharistic Congress office, St. Mary's Cathedral, Sydney, has been given a thorough test. The new station is working in conjunction with 2UE, Randwick, a "B" class station, and it is stated that 2UE has been specially leased for the Eucharistic Congress to be held at Sydney this year.

The general manager of the Broadcasting Company of Australia Pty., Ltd. (3LO), Melbourne, has announced details of a new plan for investigating atmospherics, and wireless fading shortly to be undertaken by 3LO. The Wireless Institute of Australia is expected to co-operate in the experiments, which it is hoped will show, in a general way, where static and fading are at their worst.

From the *Electrical Engineer of Australia and New Zealand* we gather that the Postmaster-General's Department intends to effect a re-allocation of broadcasting wavelengths. The wavelengths of Class A stations will not be altered greatly, the tendency being downwards to 300 metres for main stations and to 250 metres for country stations. The Class B stations will accommodate between 200 and 250 metres.

BOUVET ISLAND.—According to the London *Telegraph*, Lars Christensen, who sent out the Norwegian expedition which occupied Bouvet Island in the South Atlantic, has taken steps to erect a wireless meteorological station on the island. If conditions permit the station will work all the year round, and will thereby be able to give vital weather forecasts to South Africa, South America and all navigation in that part of the Antartic. It is understood that Lars Christensen intends to defray the entire cost of the erection and the running of the station.

CHINA.—The *Electrical Review* reports that the radio station at Harbin commenced broadcasting on Jan. 1. The wavelength is 445 metres, and its signal is COHB. It is said to be the largest station so far constructed in North China.

The *Electrical Review* says that in addition to the short-wave wireless station recently built at Nanchang, Kiangsi provincial capital, the authorities are contemplating the construction of a broadcasting station there and the installation of receiving sets in all districts in the province, so that lectures and news may be broadcast from the capital to the whole province. A short-wave wireless station has also been built at Kiukiang, Kiangsi province, for military use.

CONGO (THE).—An agreement has been arranged between the Government authorities of French Equatorial Africa and the Belgian Congo for the laying of telegraph and telephone cables across the Congo river between Brazzaville on the one side and Kinshasha-Leopoldville on the other.

FRANCE.—The future of broadcasting in France is still undecided pending a full official inquiry. In the meantime the broadcasting interests are being permitted to continue their activities, though this concession has only been granted after strong protests against the earlier edict that all private broadcasting must cease on Feb. 1, as already mentioned in these columns. A Paris correspondent of the *Wireless World* states that official plans provide for the division of the country into eighteen "transmission districts," each served by its own Government station. In Paris, Bordeaux, Grenoble, Lille, Limoges, Lyons, Marseilles and Toulouse official stations are already in operation. It is expected that each station will eventually have a power of 3 kw.

Though nothing is yet definitely known of the broadcast system that the Government is preparing, it would seem that the State monopoly project has been seriously compromised by recent events. The *Wireless Trader* reports that the mass of opinion, outside circles interested in State industry, is against State monopoly. On the other hand, the situation of wireless is now fundamentally altered inasmuch as the regulation of it is at last recognised as a question of national importance, a point which, in fact, is not infrequently missed on *this* side of the Channel, not only regarding broadcasting but as regards the more recent developments of radio communication. A settlement outside Parliament is no longer possible. It is doubtful whether anything will be done before the new Parliament meets, and the only certainty of the moment is that the Government has not taken sides with the State monopoly party (Post Office officials), or the partisans of "controlled liberty" (the trade and most of the general public).

The wavelength of the Tour Eiffel station, now 2,650 metres, will be reduced to 1,400 metres before the end of the current year. This is a consequence of the decision of the recent Washington Congress, fixing at 1,340-1,875 the zone for long-wave stations. It is believed that the power of the station will at the same time be advanced to 100 kw.

The Paris correspondent of *The Times* reports that the Chamber adopted, on March 13, a measure introduced by the Government to regularise, until definite legislation is passed, wireless broadcasting from French stations. This measure authorises the Government to renew the broadcasting licences of all stations existing before Dec. 31, 1927, the date when the last legislation on the subject expired. Broadcasting stations created after that date must be closed, and those which have been transformed or improved must revert to their original condition within a month of the promulgation of the Bill. The erection of new stations will not be permitted for the present, but those devoted to experiment and research will be allowed to function.

GERMANY.—Reuter's Essen agency cables that owners of wireless sets have formed a union for the purpose of protecting their rights, and have affiliated themselves to the National Society and Rhenish-Westphalian Wireless Dealers' Federation. The first move of the new Union is to pass a resolution, which has been forwarded to the Government Commissioner for Wireless, the Postmaster-General for the Dusseldorf area, the Oberburgermeister of Essen, and the Chief of the Essen Tramway Administration, to the effect that owners of wireless sets will decline to pay the Government licence fees unless and until the interference with reception caused by the overhead wires of the tramways is abolished. Many experiments have been made, and are still being continued, to overcome this trouble.

The new broadcasting station at Kaiserslautern, inaugurated on Feb. 20, is at present limited to a power of 2 kw., but if no interference is caused to French communications, it will be increased to 4 kw. The station works on a wavelength of 204.1 metres, and programmes are relayed from Stuttgart and other stations in the area.

The report of the Siemens and Halske Company states that the works were adequately occupied during the year ended Sept. 30, 1927. The advantages of rationalisation were generally counterbalanced by increases in production costs, and in many branches advances in prices had to be made. In foreign markets the instances were increasing in which it was no longer possible to sell manufactures with advantage. Business revived in the second half of the year. In the telephone branch mention is made of noteworthy orders received from Italy, Holland, Finland, China and Japan. Telephone cables were ordered for the Reich postal service. An important reparation transaction was represented by a long-distance telephone cable between Paris and Bordeaux, which was ordered by the French administration.

The death of Mr. Alexander Siemens at his home at Milford-on-Sea, England, on Feb. 16, has been recorded with deep regret by the British electrical press. Born in Hanover in 1847 he came to England in 1867 and joined the firm of Siemens Bros.

He assisted in erecting the Indo-European telegraph line in 1868, and in laying cable in the Black Sea in 1869. In the early 'seventies he worked as a pupil of the late Sir William Siemens, assisting in building regenerative gas furnaces and in laying submarine cables from 1875 onwards.

He was entrusted with the management of Siemens Bros'. Electric Light Department about the year 1873 and installed the electric arrangements for the lighting of the Albert Hall and the British Museum Reading Room, and also the electric illumination of Godalming, Surrey, the first town in England, I believe, to have electric lighting.

He was twice President of the Institution of Electrical Engineers, in 1894 and 1904, as may be seen recorded on the walls of the marble entrance hall of the Engineers' Institute, Victoria Embankment, London.

He became a naturalised British subject as far back as 1878, and leaves behind him probably a record period of years of close and prominent association with electrical service and industry, and the latter covering quite the earlier years of telegraph and telegraph cable development.

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GREAT BRITAIN.—*Parliamentary Queries.*—On Feb. 21 Mr. Kelly asked whether, in view of the delay which occurred in telephoning and telegraphing by reason of the number of overhead wires brought down in recent storms, any further extensive scheme of transfer to underground cables was to be entered upon.

Sir W. Mitchell-Thomson, the Postmaster-General, said that a large number of overhead trunk telephone and telegraph wires had already been placed underground, and further routes were being so transferred. Where practicable a service by means of alternative underground wires was maintained when overhead routes were put out of service by storms. The isolation of commercial centres by breakdown of overhead lines was now rare and of brief duration.

As an example of the nature of the extensions of the underground system in Great Britain the following news-item may aptly be quoted hereunder:—

"It is expected that work will be commenced in May in connexion with the construction of an underground telephone and telegraph cable to link up Aberdeen with London and intervening centres. The cable from Aberdeen will extend for approximately 50 miles to Arbroath, where it will be linked up with one from Dundee. About six miles of duct work have been completed from Dundee to Monifieth, to which place a cable is being laid, and advantage is being taken of this work, and ducts for the Dundee-Arbroath cable are being constructed at the same time."

On Feb. 21 Captain Streatfield asked the Postmaster-General whether he would consider reducing the telephone rentals charged to farmers from business rates to residential rates.

Sir W. Mitchell-Thomson regretted that he was not in a position to give farmers exclusive telephone lines at lower rates than subscribers engaged in other businesses. A telephone service for farmers and residents in rural districts was available at specially low rates by means of rural party lines.

On Mar. 5, in the House of Commons, Capt. Fraser asked the Prime Minister whether he could now state what decision had been arrived at by the Government regarding the broadcasting of controversial matter.

Mr. Baldwin said that the Government had reviewed the decision, taken at the time of the constitution of the British Broadcasting Corporation, under which the Corporation had been prohibited from broadcasting: (*a*) Expressions of opinion by the Corporation on matters of public policy, and (*b*) statements involving matters of political, religious or industrial controversy. The Government had decided that the first of those prohibitions, i.e., that on the issue of "Editorial" pronouncements, must be maintained; but the second should be withdrawn forthwith.

On Mar. 7, Sir William informed Mr. Ammon that the number of messages sent or received by the Post Office beam services during the week ended Feb. 26 was: Australia, 7,130; Canada, 4,686; India, 15,122; and South Africa, 8,516.

There was evidence that the total traffic with the Dominions by cable and wireless was now considerably greater than it was before the beam services were established.

On Mar. 13 Sir William stated that wireless licences covering experiments in television had been issued to a number of persons. He understood that tests had been carried out, but his technical advisers considered that the matter had not yet advanced beyond the experimental stage.

On March 19, in the House of Commons, Earl Winterton (Under-Secretary for India), in answer to a question regarding Beam-Cable fusion and cable rates to India, said no representations had been received from India regarding apprehension lest a merger of the Marconi Company and the Eastern Telegraph Company might deprive the Indian public Press and trading community of the benefits of the telegraph services, but the Government were fully alive to the possible danger of a monopoly and an artificial inflation of cable charges to and from India.

On March 22 the Prime Minister, on the Cable and Wireless merger, made the following statement: "The Government and the Imperial Wireless and Cable Conference have no previous knowledge of the details of, and have no responsibility for, any financial arrangement or merger of the Eastern Telegraph Company and the Marconi Company.

"As regards the general question, I cannot make any statements in advance of the reports from the Imperial Wireless Conference, which only on Monday received proposals from the two companies.

"Since hon. members have systematically inquired as to the attitude of the Government, I think it only right to say that the Government, while it is prepared to join in discussing measures for working arrangements, is not committed, even in principle, and reserves freedom of action in regard to any proposals for transferring the operation and control of Imperial wireless services at present administered by the Government."

The Report of the Committee appointed by the Postmaster-General last July, "to examine the possibility of effecting substantial economies in the working by the State of the Inland Telegraph Service," was presented to Parliament on the 22nd ult., and contains many interesting criticisms and suggestions.

Senatore Marconi, in a recent statement in London, was understood to say that great as had been the developments of wireless since the introduction of the "Beam" those of the next two or three years would be even more sensational. He was certain that before very long we should be in telephonic touch with all the Dominions. He hoped to have the necessary arrangements ready for telephony between England and Canada in about a couple of months.

Technically the whole thing could be completed in a very few months, given the necessary Government co-operation, and with the Government, said the Senatore, rested entirely whether the scheme was encouraged or delayed.

According to the *Times* he expatiated on the immense development of the means for transmitting facsimiles of whole sheets of typescript in their original form. Very shortly they would try it with Canada.

Senatore Marconi appears convinced that ultimately facsimile would supersede Morse—for purely business and social traffic it is presumed.

The Imperial "Beam" wireless services were carrying a larger volume of traffic than any other wireless services in the world, and in the next few months services would also be working from France, Germany, the U.S.A. and Japan. Spain was opening direct communication by "Beam" with North and South America. Japan already had a wireless service to the U.S.A. and was about to introduce direct wireless services with England, France, Germany, Italy, India and Argentina.

Mr. H. G. Williams, M.P., Parliamentary Secretary to the Board of Trade, recently referred to a new invention of wireless direction-finding by the rotating loop system, which was likely to revolutionise methods of navigation. He said up to now the proportion of ships fitted with wireless direction-finders was small, but that number was steadily increasing. Experiments were now being carried out with the rotating loop system which, if expectations were realised, would place wireless direction-finding at the disposal of ships which were equipped with ordinary wireless apparatus.

The number of receiving licences issued in Great Britain and Northern Ireland brought the total number of licences to the remarkable figure of 2,418,131 not including 14,255 free to blind people. The actual increase for the month of January of this year was 34,405. By the end of February there was a further increase of 33,000 on the January figures bringing the total to 2,451,051. Since the beginning of December there has been an addition up to the end of February of 95,000 new licences or an average increase during a period of three months of over one thousand per day.

It is considered in some quarters that these increases are largely due to the opening of the Daventry experimental station, 5GB.

Be this as it may, it is nevertheless a curious coincidence that, quite unconnected with radio or broadcasting, and when reading an account of German Opera in the Ruhr by Cyril Scott, I ran across the comments of an Essen musical director who, speaking to the English critic on musical taste in England, declared that, "in the field of broadcasting some of the best music comes from Daventry.

Not so long ago a company was formed at St. Annes to furnish the public with a "wireless-on-tap" service. Over 300 houses in the town are now using the service, a loudspeaker, connected like a telephone to a control distributing station, being installed in every house; by turning a switch, or putting in a plug, the occupants receive the wireless broadcast programmes just as they would on a receiving set with a loud-speaker; no wireless apparatus is required in the house. A small weekly rental is charged, but there is no capital outlay. A larger company is now being formed to develop the service throughout the Fylde area.

During a storm on Feb. 10, lightning struck the aerial of the Community Radio Company's receiving station at St. Annes, but it passed safely to earth, and no damage was done.

The death took place at Barrowford last week of Mr. Barnabas Faraday, a descendent of the famous Michael Faraday, at the age of 85.

The Winnipeg correspondent of *The Times*, reporting on the event of the establishment of direct telephone communication by radio between Winnipeg and London, adds that in the near future the service will be extended to France, Germany and other European countries. The calls are made via Chicago, but should the system proposed by Marconi's be established to Canada, Winnipeg will be able to communicate with London by an all-Canada route, as direct telephone connexion with Eastern Canada will be established next month.

According to the London financial journals the balance sheet of the American Telephone & Telegraph Co. as at Dec. 31 last shows a surplus of assets of $272,435,982. The total income for the past year was $216,524,824, and the net income was $128,614,910, of which dividends absorbed $97,379,934. The total carried to surplus was $79,173,841.

The Bell System accounts for the year show total operating revenues of $894,699,173, and a net income of $166,059,152. Dividends absorbed $112,401,125, and $101,596,892 was carried to surplus.

The Federation of British Industries has written to the Chancellor of the Exchequer and the Postmaster-General urging that "the transmarine services, wireless and cable, at present operated by the Government, should be transferred to commercial hands. The Federation points out that, in spite of high charges, there were deficits amounting to something like £1,500,000 a year on the telegraph services, wireless and cable, operated by the General Post Office. Commercial operation was more likely to have beneficial results, by relieving the taxpayer of the deficit and by an improvement in the service.

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It was of importance that the "Beam" service should be developed in the interest of cheap and rapid communications, and the Government was asked to give an assurance that nothing would be done to hamper the freest and fullest development of wireless telegraphy."

Recent developments regarding cables and wireless interests amounting to well over fifty million pounds sterling have quickly shown that the entire matter is one that has the possibility of wide-reaching re-percussions within it; maybe in unlooked-for directions from a national and inter-colonial view-point. The paragraph quoted above from the F.B.I. is therefore simply inserted to keep our readers in touch with events, and opinions which bear upon matters telegraphic and the present transition period.

With the latter end well in view it will not be out of place to emphasise the American estimate of radio and cable under "U.S.A.," as expressed in the last paragraph by Mr. Clarence Mackay, it is only fair to mention that the one thing which set the share market boiling was the result of the conference between the wireless and cable interests and the issue of the following statement by the Eastern and Associated Telegraph Companies and Marconi's Wireless Telegraph Co., Ltd., on the 14th ult.

"An arrangement has been provisionally arrived at, on the recommendation of Sir William Plender and Sir Gilbert Garnsey, between the boards of the Eastern and Associated Cable Companies and the Marconi Wireless Telegraph Company for a fusion of interests through the medium of a proposed holding company subject to a satisfactory agreement being made with the British Government and the Governments of the Dominions and India, and also to acceptance by the stockholders and shareholders of the companies concerned.

"No announcement of the terms of the arrangement can be made in the meantime, as its consummation is dependent upon the conditions above mentioned. "(Signed) J. DENISON PENDER,
"Inverforth."

The total face value of the shares of the two interests is said by the London Press to reach the enormous figure of £53,000,000, of which that of the Eastern group reaches no less than 36½ millions.

The *Daily Telegraph* City editorial ended its week-end view of the situation on Mar. 15 with the following words: "A considerable time must elapse before the approval can be obtained and the position become clearer. Until the scheme is more detailed and later figures are available of the earnings of the companies concerned . . . there must be considerable room for differences of opinion."

On the top of the Eastern-Marconi combination comes the news from across the Atlantic of the huge American fusion with Mr. Mackay as President, and so the telegraph world moves on!

HOLLAND.—The Second Chamber has passed a Bill providing for the official regulation of broadcasting. The new law will be incorporated in the Telegraph and Telephone Act, and will be put into effect by Order in Council. An amendment was moved and accepted to provide for the equal division of the hours of transmission between the various broadcasting societies, i.e., neutral societies, Roman Catholic, Orthodox Protestant, &c., and was duly accepted. A Government proposal to levy a fee of ten florins for each receiving set was withdrawn.

HUNGARY.—Budapest informs us through the medium of Reuter's Trade Service that a wireless telephone company has been founded for the purpose of installing receiving sets on the trains of the State railways and also in the waiting rooms at the big stations.

Arrangements are being made to increase the power of the Vienna broadcasting station, and it is stated, says the *Electrical Review*, that the new Budapest station will be more powerful than the existing one. The number of radio subscribers in Hungary is 800,000, the bulk of whom are in the Budapest area.

INDIA.—A definite advance has been made by the Telegraph Department in India with regard to the quick transmission of heavy Press messages to different stations at one and the same time. The Department has now carried out successful trials in transmitting messages to offices in different directions in one operation from Delhi. In this arrangement, the Baudot printing telegraph system of working is used. It is understood that the Department proposes to adopt this system of control in large telegraph offices which would enable engineers to get the best results out of the lines and apparatus available. With regard to the service between India and Burma, which has often been subject to delays on account of damage to the line by storms, the difficulties are being overcome by a special system of wireless working, and delays to Indo-Burma traffic are now a rare occurrence.

As regards broadcasting, the following two paragraphs, respectively on the authority of the Indian correspondent of the London *Daily Telegraph* and Reuter's Bombay Agency, clearly show the present situation.

The future of broadcasting in India is a matter for speculation. The Company has apparently been unsuccessful in its attempt to obtain a subsidy from the Government of India, and Mr. Eric Dunstan, the manager, after having an interview with the Viceroy, has left for England to endeavour to interest wirelesss manufacturers in the provision of further capital to put broadcasting in India on a firm basis.

Following upon the unsatisfactory financial position of broadcasting in India, attributed largely to the extent to which "piracy" is practised, rumours have been current recently regarding the future of broadcasting in India. It is now understood, however, that the Indian Broadcasting Company has definitely decided to continue its present services both in Bombay and Calcutta, but the hours of broadcasting will be slightly reduced as from Mar. 1.

IRISH FREE STATE.—At a recent meeting of the Free State Broadcasting (Advisory) Committee, says the *Electrical Review*, it was stated that the Committee had considered the suggestions received from listeners in response to the invitation recently issued. Thirty-eight letters were received from a total number of 27,000 licensees, and it was agreed that the criticisms and suggestions which they contained could not be accepted as sufficiently representative of general opinion on programmes to justify any serious attempt to frame programmes in accordance with them. It was found to be impossible to reconcile in any general way the views expressed. The Committee recommended, however, that the broadcasting officials should consider the letters carefully, with a view, so far as they might judge best, to framing programmes so as to preserve a fair balance between the various classes of programme items, while maintaining such a general standard of programmes as would ensure the value of broadcasting as a means of public education in the musical as well as in the general sense.

ITALY.—"*Secret*" *Telegraphy*.—The Italian Government has acquired, in the "interests of national defence," an invention covering "a system of telegraph and radio-telegraphy combined with a method of typewriting adjusted to guarantee security of communication," says the *Morning Post*. The inventor is a Leghorn engineer, Manrico Compare, who, finding little encouragement in London, communicated his experiments to the Scientific Congress at Innsbruck, and it was there that the Italian Government opened negotiations for tests that have ended in the acquisition of the patent.

It is understood that the invention is of the cryptograph type and is not unknown to telegraph engineers. If so it is not likely to prove of practical use so far as commercial telegraphy is concerned.

The Rome correspondent of the *Financial Times* reports that the Compagnia Italiana dei Cavi Telegrafice Sottomarini (Italian Submarine Cable Company) proposes to reduce the value of its assets in accordance with the gold parity of the lira. A shareholders' meeting is convened for Mar. 31, when sanction will be asked for correspondingly reducing the company's capital, which is at present 300,000,000 lire, of which 250,000,000 lire is paid up. At the same meeting the re-increasing of the capital will be considered.

NORWAY.—The Oslo correspondent of *World Radio* reports that the directors of the Broadcasting Company have now definitely approached the Norwegian Government (Board of Trade Department) with a detailed and exhaustive statement of the state of broadcasting in Norway, and the methods by which pressing difficulties might be met. The question of the establishment of one large and powerful station, they say, is vital for the future welfare of broadcasting in Norway. The financial aspect of the situation is dealt with in the report to the Board of Trade. It is suggested that the Broadcasting Company should be granted a renewal of the concession, and that the State should take over the station at its current value. The establishment of a large station at Oslo would leave several of the company's present stations available for use in other parts of the country. It is hoped that the matter will be decided quickly so that the planning of the proposed powerful new station may be begun without delay, with a view to its being ready for broadcasting some time next autumn.

SWEDEN.—The *Electrical Review* informs us that the number of licences for radio broadcasting sets in Sweden during the past year rose by 85,574, an increase of more than one-third since 1926. At the end of 1927 there were 328,133 licensed sets, representing 54 sets for every thousand inhabitants. This is claimed to be a world's record. The new broadcasting station at Motala, in Central Sweden, is said to be the strongest and technically the most modern in Europe, and the Stockholm correspondent of *World Radio* reports that, for the purpose of freeing it from interference with the new Zeesen station, the wavelength of Motala has been raised to 1,380 metres. Boden's wavelength is also changed, in consequence of interference with Stambul. It is now transmitting on 1,190 metres.

Nearly 350,000 licences were issued in Sweden by March 1. This is an increase, since the beginning of 1928, of about 20,000.

U.S.A.—*Automatic Control and Signalling*.—The Chicago and North-Western Railway has announced that a system of automatic train control costing $3,000,000 (£600,000) will be installed along a distance of about 500 miles, from Chicago to Omaha, the longest stretch in the world over which such a system will have been established. The New York correspondent of *The Times* states that trains will be automatically stopped at danger signals without the intervention of the driver, thus ensuring safety, even when the driver fails to notice a signal or if for any reason it is out of action. The system will also enable passenger trains to travel at a maximum speed of 70 miles an hour in all weathers, a speed not considered safe in bad weather on lines where automatic control has not been established. The system will have been completed along the Chicago-Omaha line by May 1. The first installation of this system was made in Iowa in September, 1925. It is worked by means of an electric current along the rails, which is picked up by coils on the front of the engine. The first danger signal to the driver is a whistle caused by this current, and the speed of the train is reduced automatically to 20 miles an hour. A second whistle follows, and if both whistles are ignored by the driver and the train is still running, full controls are applied and the train is automatically stopped.

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The New York correspondent of *The Times* reports that engineers of the General Electric Company announced on Mar. 3 the development of a high-power short-wave wireless valve. The new valve is a vacuum tube 5 in. in diameter and about 2 ft. long. It is set in a wooden cage, surrounded by wires, condensers, and electric meters. It operates as a self-excited oscillator on a six-metre wavelength, and is capable of radiating from 10 to 15 kw. of high frequency power, or about 50 times as much as any other short-wave tube has been known to produce. The valve is connected through a coupling system to a copper bar, about 10 ft. long, which is able to radiate into space the full 15 kw. generated by the oscillator.

During last year only 494 tons of insulated wire and cable were exported from the United States, as compared with 738 tons in 1926.

President Newcomb Carlton has recently announced in San Francisco, Cal., that the plan of the Western Union Telegraph Co. to lay a high-speed cable between Seattle, Washington, and Japan has been abandoned. The reason for this, according to the *Telegraph and Telephone Age*, is the inability of the telegraph company to meet the requirements of the Japanese Government. The Western Union now has under consideration plans for laying a cable across the Pacific via the southern route, starting at San Francisco, touching the Hawaiian Islands and stretching to the Philippine Islands, which would be the main terminal in the Far East, instead of Hakodate Island, a Japanese possession.

The report of the Radio Corporation of America for the year ended Dec. 31 last states that a reliable system of high-frequency directive transmission, known as the R.C.A. Projector System, has been developed by the engineers of the Corporation, and is now in operation on several circuits. This system, says the *Electrical Review*, in efficiency, compares most favourably with the performance of the Marconi "beam" system, and offers some advantages in simplicity of construction and adjustment. The latest developments in short-wave radio communication have been made available in the A. E. F. G. consortium of stations in Argentine and Brazil, in which the R.C.A. is a partner, and increased efficiency has resulted. The development of the "Projector" system is the patent of the R.C.A., and companies owning other stations, which may use it in the future, will have to do so on some arranged formula with regard to royalties.

Cable v. *Radio from an American point of view.*—The *Financial News* reports that at the recent general meeting of the Mackay Companies, the president, Mr. Clarence H. Mackay, drew attention to the important extensions to the radio services acquired by that cable company during the past year, and the active entry of the company into the wireless field at an early date. He referred, says the Montreal *Financial Times*, to the acquisition of the Federal Telegraph Co., operating a point-to-point system and ship-to-ship service of radio transmission, but emphasised the fact that the entry of the company into the wireless field was not occasioned through any fear of adverse competition from this direction, but by reason of the realisation that the radio can be rendered a most valuable supplement to the wire system.

The maximum efficiency in public communication service would be only attained by co-ordinating communication by telegraph, cable and radio, which included facsimile and photo-electric transmission.

Since our last issue television has been again to the fore, but except for the mirrored transmission of the movements of a young lady, at the Baird Television Development Company's laboratory in Long Acre, London, to the Berengaria, 1,500 miles from land, the one or two other transmissions from the same studio, though obviously those of living people, were not actually recognisable, as was the fiancee of the chief wireless operator of the ocean liner mentioned.

This was on Mar. 6 or 7, and the following news item from Hartsdale, New York, through Reuter's agency, is further evidence that though, perhaps, on the road to success television over distances so great as that represented by the Atlantic is still very much "in the air."

"On the night of Feb. 8 a man and a woman sitting before electrical apparatus in a London (England) laboratory were seen by a group of people in a darkened basement in Hartsdale village, New York, U.S.A., who watched them turn their heads and move from side to side; the images were crude and broken, but they were images nevertheless. The demonstration was made by the Television Development Company, of London, using short-wave wireless sets for transmission, and a televisor invented by Mr. John L. Baird for reception."

The *Electrical Review* of April 15 last year described similar results over a distance of 250 miles between New York and Washington, which employed apparatus designed and manufactured by the Bell Telephone Company, but a big advance upon this was the Baird trials in this country over English land lines last year. However, if the art of television is "still in a primitive state," to quote from a technical contemporary, telephotography and that across the Atlantic is coming into practical use between the U.S.A. and Great Britain, according to the London *Daily Express*, which has adopted the system of the Bell Laboratories for use between its London and Manchester offices, and which rather bewilderingly, to the lay mind, described its trans-Atlantic sample pictures as 'Telephoned from America," apparently because the transmission was by radio.

Simultaneously with this announcement other London newspapers, the *Daily Telegraph*, *Daily Mail*, &c., appear to have adopted the Telefunken-Karolus-Siemens system of Telephotography for the same purpose of providing their readers with the latest *illustrated* news from all the large centres, and all are to be congratulated upon their enterprise, while the part which the Post Office Engineering Department will play in providing immediate, stable and alternative line communication should also not be left out of the picture.

To those who are sufficiently interested in it, it may be mentioned that the German system—which has for some time been working regularly between Berlin & Vienna—was described in the March number of the *T. & T. Journal* last year, p. 102-103, when the following observation was made: "The system is undoubtedly an excellent one and will naturally receive closer attention in the technical circles interested."

Of the Bell, or American, system of telephotography, without having practical knowledge, one is not entitled to judge, but from the description given by the *Daily Express*, which described "a small glass bulb coated with potassium—a device known as a photo-electric cell," there are evidently similarities in the American and German systems, for in the Siemens photo-electric cell the photo-active surface is also potassium.

There is a fairly long list of personal items this month, for which the Managing Editor will no doubt find space, and the obituaries all show how Time is gently removing some of those to whom—even a few on the present retired list of the C.T.O.—we looked up in past days.

Miss E. M. Macnamara's death took place in Anerley in January last. Entering the C.T.O. in 1882, in twenty years she had reached the position of 1st Class Supervisor and the successive rank in 1908, retiring owing to ill-health in 1921, which, unfortunately, continued in a greater or lesser degree until her demise. She had a very charming nature and in great favour with all who knew her inside and outside the office.

Then Miss H. H. Breden, late of the Trunk Telephones, who, after some considerable period of ill health, passed away on Jan. 22, at her home in Askrigg, Yorks. Miss Breden was formerly of T.S., which staff she joined in 1873. She was a most capable officer and very adaptable, as her career well proved. She had a first-class experience of practical telegraphy and for some time took duty in the Racing Room and later in the Metropolitan Gallery, from which latter floor she was selected for duty in the Telephone Room, then an absolute novelty, and in 1901 became an Assistant Supervisor in charge of the new "Switch Room," or Trunk Exchange, on the second floor of G.P.O. West—now the French Division of the Cable Room—subsequently, in 1902, being appointed to supervisor of the Trunk Telephones, G.P.O. South, which appointment she held until her retirement early in 1916.

On Feb. 12 Mr. Andrew A. Frew passed over. One time Superintendent of the C.T.O., after paying a visit to relations in South Africa a year or two back, he contracted a long illness soon after his return, apparently the result of, or at least following a, motor tour in Scotland. Mr. Frew commenced his Post Office career as far back as 1869,in the N.W. District.

Mr. George Gall, Deputy Controller, Edinburgh Postal and Telegraph District, retired on reaching the age limit after 43 years' service, on Mar. 3, and was presented with a bureau by his colleagues.

Mr. John Low, Overseer in the telegraph department, G.P.O., Edinburgh, retired under the age limit on Mar. 1. During the war Mr. Low served for some months as telegraphist with the Grand Fleet at Scapa Flow.

The following promotions in the C.T.O. are noted and those concerned are to be congratulated upon their respective rises in the official world.

Inland.—Mr. J. Rees, Asst.-Supt., to be Supt. Lower Grade. Miss J. M. Rintoul, Supervisor, to be Supervisor Higher Grade.

Overseas and Wireless.—Mr. H. G. Sellars, Provisional Asst. Supt., to Asst. Supt., Cable Room.

Mr. V. E. Fauvelle, Provisional Overseership, also made substantive.

The following, on the Cable Room Establishment, have been appointed to fill the post of Provisional Asst. Supt., and Provisional Overseer, respectively: Mr. J. P. Fox and Mr. W. T. Moon.

To these latter one would say Good Luck!

One has occasional shocks from correspondents, although the writer has had no real cause to grumble throughout nearly fourteen years' connexion with this journal and as a scribbler in its pages, either concerning letter-writers or critics. In the beginning of February, however, I received a letter from a Britisher in the South of France who, writing of "one of your very interesting articles in the *T. & T. Journal*—then added the date, "September, 1923," and went on with a request for the verification of a quotation I then gave from Zola, on "Electricity," now nearly five years ago.

I am glad to say that, thanks to an old friend in Paris, I was able to give chapter and verse and, in case any of our readers should wish to refresh their memories by writing to me for further particulars, the quotation was from Zola's "Travail"—the second of his "Quatre Evangiles," and on this occasion the original and not an an abbreviated translation will be given:—

L'Electricité.—Un jour doit venir où l'électricité sera à tout le monde, comme l'eau des fleuves, comme le vent du ciel. Il faudra non seulement la donner, mais la prodiguer, laisser les hommes en disposer à leur guise, ainsi que l'air qu'ils respirent. Elle circulera dans les villes telle que le sang même de la vie sociale. Dans chaque maison, il y aura de simples robinets à tourner, pour qu'on ait à profusion la force, la chaleur, la lumiére aussi aisément qu'on a aujourd'hui l'eau de source. Et la nuit dans le ciel noir, elle allumera un autre soleil, qui éteindra les étoiles. Elle supprimera l'hiver, elle fera naitre l'éternel été en réchauffant le vieux monde, en montant fondre la neige dans les nuages.

J. J. T.

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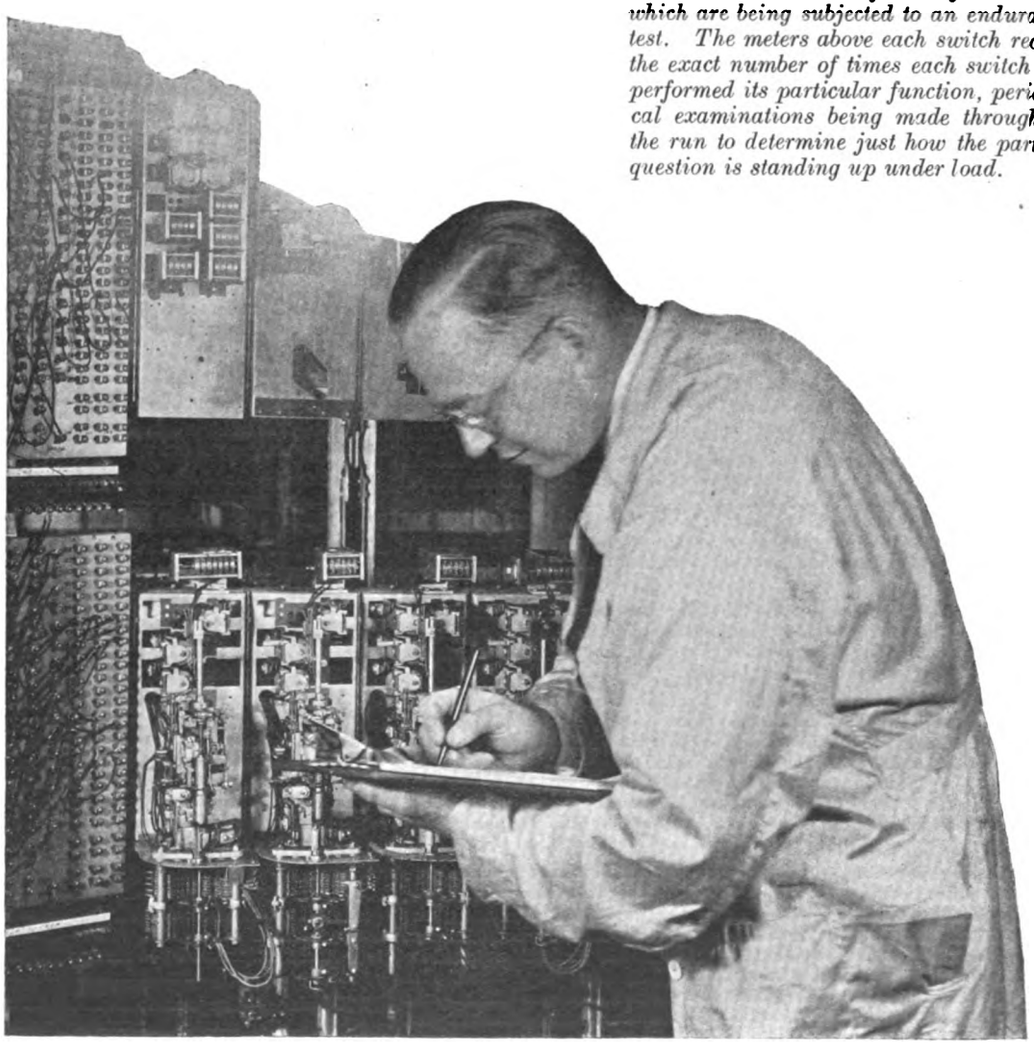
The Switch

Here is shown a bank of Strowger switches which are being subjected to an endurance test. The meters above each switch record the exact number of times each switch has performed its particular function, periodical examinations being made throughout the run to determine just how the part in question is standing up under load.



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The Telegraph and Telephone Journal.

PUBLISHED MONTHLY IN THE INTERESTS OF THE TELEGRAPH AND TELEPHONE SERVICE, UNDER THE PATRONAGE OF THE POSTMASTER-GENERAL.

Editing and Organising Committee - - - J. STUART JONES. W. D. SHARP. J. F. STIRLING. W. A. VALENTINE. J. W. WISSENDEN.

Managing Editor - - - W. H. GUNSTON.

NOTICES.

As the object of the JOURNAL *is the interchange of information on all subjects affecting the Telegraph and Telephone Service, the Managing Editor will be glad to consider contributions, and all communications together with photographs, diagrams, or other illustrations, should be addressed to him at the G.P.O. North, London, E.C.*1. *The Managing Editor will not be responsible for any manuscripts which he finds himself unable to use, but he will take the utmost care to return such manuscripts as promptly as possible. Photographs illustrating accepted articles will be returned if desired.*

VOL. XIV. APRIL, 1928. No. 157.

THE TWO VOICES.

IT would be obviously improper for us at the present juncture to offer any comment on the Hardman-Lever Report on the telegraphs. We will confine ourselves to remarking that it was naturally received with unchastened delight by that section of the Press which is the untiring and uninspiring critic of all non-commercial undertakings. The comments of our critics, however, are not always as luminous as their satisfaction. The *Daily Express*, for instance, has two successive articles on electrical services in the same issue. One, entitled "Our Out-of-date Post Office," declares that "archaic organisation must go" and enlarges on the evils of State management, which is "forced to violate the most elementary of commercial maxims," and so forth. The following article sympathises with the victims of electrical supply companies, "unique for their combination of extortion and inefficiency." The reader can, of course, take his choice as to the system for which he shall reserve his severest indignation. He may, poor man, swayed by the conflicting voices of his guides, wonder whether, after all, he would not prefer to suffer the "archaisms" of State service rather than the "extortions" of private enterprise.

CASCADES OF NONSENSE.

A *feuilletonist* in one of the lighter daily journals deems the task of telephoning overseas "wearing" and "exhausting." In witness whereof, he describes how a lady friend attempted to make a telephone call to a friend staying at a hotel in Berlin. The call was answered by a hotel official, we are told, *in a torrent of German*! That a German official should speak his own language in a German city hardly seems to us a reproach to the telephone service, although irksome to a uni-linguist in London. The lady, however, equal to the occasion, exclaimed: "For the love of Mike, talk English." Good Catholics assure us that the saints still work miracles; and this impassioned, if somewhat disrespectful, appeal to the patron saint of Germany apparently had the desired effect. Thereafter, we gather, all went tolerably well.

This frail anecdote would hardly be worth notice except that it is typical of some of the girding at the telephone (we do not complain of reasoned criticism) which recurs fitfully here and there. Torrents of English, French, German, Dutch, Danish and Swedish and other European idioms continue to flow, notwithstanding, in increasing volume through the overseas telephone channels, to the furthering of a better understanding, we confidently hope, of the nations thus in closer and more intimate communion than ever before. It is the constant task of the administrations concerned to provide additional circuits for the ever-increasing demands on the service.

RECOVERING THE WASTE.

PRIZE COMPETITION.

IN an article which we print in another column, Mr. E. J. Johnson points out the marked effect of the elimination of waste on the profitableness or otherwise of an undertaking, and demonstrates the good results obtained in Glasgow by concentrated effort on the improvement of the service in the direction of reducing loss of time and effort occasioned by ineffective calls due to "Number engaged," "No reply," "Wrong number," &c. The gain in time and money on the calls for one day (to say nothing of the increased satisfaction of subscribers and the general improvement of the service), which he shows as resulting from an increased percentage of effective calls of 1.5% on a traffic of 200,000 calls alone, is substantial and exemplifies in a striking manner the effect which a small variation in percentages can have on large figures.

As Mr. Johnson says, there are doubtless other phases of waste deserving of consideration which will occur to readers of the *Journal*. There are, indeed, still many problems in connexion with co-operation between subscribers and the telephone staff, and between exchange and exchange, which admit of useful discussion, and on which it is very desirable to pool experience from all parts of the country, or to obtain fresh suggestions from those in actual touch with the subject. The Editing Committee has therefore decided to offer prizes for articles by telephone men and women on elimination of waste in connexion with the service and not necessarily confined to the factors referred to by Mr. Johnson.

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The articles should not exceed 2,000 words in length and should be submitted by June 15 next.

The following prizes are offered :—

	£	s.	d.
Men :			
First prize	4	4	0
Second prize	2	2	0
Women :			
First prize	4	4	0
Second prize	2	2	0

The merits of the articles will be adjudged by the Editing Committee, whose decision will be final. The Committee will reserve the right of publishing if they desire articles of sufficient interest which do not gain a prize or to summarise the whole of the suggestions received.

HIC ET UBIQUE.

THE Transatlantic telephone service was extended on Mar. 8 to the towns in Canada shown below, in addition to those to which it is already open (viz. : Ottawa, Quebec, Montreal, Toronto and Hamilton, Ont.) : St. John (N. Brunswick) (minimum charge for the first 3 minutes £9 12*s*.), Halifax (N. Scotia) (£9 12*s*.), Winnipeg (£10 4*s*.), Calgary (£10 16*s*.), Vancouver (£11 8*s*.).

Telephone service between America and Europe was further extended on Mar. 28, when communication was opened between the United States and Paris. The charge for a 3-minute call between Paris and New York is £9 15*s*.

An additional "through" telephone circuit was provided at the beginning of March between this country and Switzerland, bringing the number of Anglo-Swiss lines up to three.

The new circuit is of modern type and is carried in cables throughout its length between London and Geneva.

A telephone service between this country and the Grand Duchy of Luxemburg was opened on Mar. 15. Communication is available from all parts of Great Britain, but will be restricted initially, in the Grand Duchy, to Luxemburg City.

The charges for a day call of three minutes' duration between the First British Zone and Luxemburg is 8*s*. 6*d*.

A provincial newspaper, under the caption "Where Telegraphs Pay," proceeds to quote as a shining example the profits made by the American Telephone & Telegraph Company of New York apparently oblivious of the fact that this company deals with telephone service alone.

We quote two testimonials to the efficacy of the Anglo-Continental and Transatlantic Telephone Services respectively. The first, addressed to the *Motor Cycle* by a firm of motor-cycle manufacturers, is as follows :—

Very few people realise the great extension of Continental telephone facilities which has taken place recently. A call can be put through to practically any town in Europe with very little delay and at a very low cost, and in our experience conversation is always perfectly clear.

Our Continental agents are now ordering urgent machines by telephone in the same way as the home agents, and we have just booked an order for six 600 P. & M. "Panthers" for urgent delivery to Vienna, full details of the order being given on the telephone.

The other is from an American visitor to the Controller of the London Telephone Service on the eve of his return to New York :—

Just before sailing back to my home in New York City, I feel that I owe it to you to thank you for the wonderfully efficient service you have given me—and I am sure do to others—in the matter of the overseas telephoning. I have had occasion to use this service four times—once from Berlin and 3 times from London—and each time have found everything perfect ; was never kept waiting, marvellous connexions ; and, in fact, everything was done to give me—at least—my money's worth. I think when the public realises what a great job you are doing it will be more appreciated.

We are informed by the High Commissioner for Canada that the Canadian National Railways Telegraph Department is installing, at a cost of $2,500,000, a new modern high-speed telegraph system between Vancouver and Montreal, which is expected to be in operation within three months. Mr. R. W. Ball, General Manager of the western region, states that the carrier current system which is being used, and which is practically the application of the wireless audio-frequency system to telegraph service, will make it possible to transmit 84 messages simultaneously, using the human voice in both directions. The new system uses two wires, whereas the old system used one wire over which eight messages could be sent simultaneously. The new service will therefore result in speeding up communication ten-fold. Installation of the new equipment between Montreal and Winnipeg has already been completed.

The introduction of automatic working at Leicester was successfully accomplished on 18 Feb., when a portion of the equipment which is eventually to serve the whole of Leicester was brought into use. An interesting descriptive article on the subject is unavoidably held over till next month.

Other important articles, including a further instalment of Mr. Sellars' Chronology of Telegraphs, &c., are crowded out owing to pressure on our space.

DETERMINATION AND DISTRIBUTION OF TIME.

SUCH was the somewhat formidable title of a lecture to members of the Post Office Telephone & Telegraph Society of London, given on the 19th ult., at the Institution of Electrical Engineers, Victoria Embankment, by F. Addey Esq., B.Sc., F.R.A.S., M.I.E.E., of the Wireless Section, Secretary's Office, G.P.O.

However formidable the title may have appeared to many, and however difficult a subject of this kind must be, one would have thought, to handle, Mr. Addey made the listeners' task a light one by his clear enunciation, and generally facile delivery of a subject, the fundamental basis of which is astronomic.

The lantern slides were beautifully clear, and although it was necessary to follow the lecturer very attentively and closely, the steady logical step-by-step process from "the earth as fundamental timepiece" through "Sidereal," "Solar" and "mean" times, then via the study of the mechanical and electrical devices for maintaining sufficiently accurate time-recording instruments, &c., which Mr. Addey adopted, right on to the necessity for super-accuracy of Time-measurements for the use of modern Navigation, and lastly the most modern means of the world-wide distribution of accurate time from Greenwich via Rugby Wireless Station—all these progressive stages, and Mr. Addey's masterly manner in dealing with them, could not but make a lasting impression upon an attentive audience who were simply held for 80 minutes or more by one whose scientific enthusiasm and thoroughness are proverbial.

In the unavoidable absence of Mr. L Simon, Mr. A. J. Stubbs, M.I.C.E., M.I.E.E., very kindly took the Chair.

Mr. Addey expressed his gratitude to Sir Frank Dyson (Astronomer Royal) for permission to make full and detailed enquiries into the time apparatus at Greenwich Observatory ; to Mr. Hope Jones for detailed information about the synchronome clock and the free pendulum system ; and to Colonel Booth and Mr. Gibbon for information about the chronopher system.

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THE WORKING OF THE INTERNATIONAL TELEPHONE SERVICES.*

BY H. G. TRAYFOOT.

(*Continued from page* 136.)

A brief reference to the language question as it affects the working of the Anglo-Continental circuits seems desirable. The Réglement provides that "for the preparation, establishment, and disconnexion of calls the French language should be used except in cases where special arrangements can be made for the use of other languages."

The French language is employed for operating purposes on the Anglo-French, Anglo-Belgian, and Anglo-Swiss circuits, but on the other routes a considerable amount of English and German is employed. Of the 6 Assistant Supervisors employed on the Anglo-Continental work in the London Trunk Exchange, 4 can speak French and 2 German, while of the operating staff 39 can speak French and 10 German.

The opening of so many new services within such a short period has added very greatly to the responsibilities of those who direct the Continental traffic in the London Telephone Service, more particularly in view of the language complications, and it would not be out of place to take this opportunity of paying a tribute to the highly successful manner in which the difficulties have been overcome.

Since the International Telegraph Conference of 1925, the C.C.I. has adopted the Telegraph Réglement as the basis of its operations, and has set vigorously to work to amplify its provisions by fixing standards and by preparing sets of working instructions in connexion with the various special services and classes of traffic. A considerable number of studies have also been undertaken in connexion with various aspects of the working.

The C.C.I. has, for example, tackled the question of the provision of a "stable and rapid service." It considers that uniformity is desirable in this as in other aspects of the work, and it has accordingly passed a resolution to the effect that however desirable it may be that there should be a sufficient number of circuits to ensure a "no delay" service on the international routes, there are serious economic obstacles to the realisation of such an ideal. It is, however, desirable to reduce delay to the lowest possible point consistent with the necessity for covering the annual charges.

The resolution goes on to state that the following standards of service ought generally to meet this condition :—

> For circuits less than 500 kilometres (roughly 300 miles) in length, the delay should not normally exceed 30 minutes.
>
> For circuits between 500 and 1,000 kilometres in length, the delay should not normally exceed one hour.
>
> For circuits over 1,000 kilometres in length, the delay should not normally exceed 1½ hours.

Such standards as these may not be regarded as ensuring a particularly rapid service, but it has to be borne in mind that in the past delays in excess of 1½ hours have been the rule rather than the exception on many circuits not as much as 1,000 kilometres in length.

It should also be stated that on many of the international routes the normal delays are much below these standards. On the Anglo-Dutch lines the delays reach about 40 minutes during the morning, but there is little or no delay at other times. On the Anglo-Belgian routes there is little delay at any time.

One of the most difficult problems has been, and still is, the adoption of a uniform basis for fixing international telephone rates.

The C.C.I., after examining the annual charges incurred in connexion with the international service has made some proposals as to the figures which might be taken to cover operating and maintenance costs, interest on capital, depreciation, &c., but there seems to be no prospect of the general adoption of these figures. One of the most difficult points to be determined is the multiplying factor to be employed in respect of wires carried in submarine cables. The British Administration is inclined to the view that in the present stage of technical development it is useless to attempt to fix standard figures to govern international charges.

Among other matters recently dealt with by the C.C.I. the following may be specially mentioned :—

(1) Rules have been prepared for handling calls at international centres which act as "transit" or intermediate stations in the completion of calls.

(2) Instructions have been drawn up to regulate the preparation of calls in advance by the use of telegraph circuits superposed on international telephone lines.

(3) Rules for handling *préavis* calls have been prepared.

(4) A special study has been made of the methods adopted in connexion with the training of staff in international work.

(5) Special efforts are being directed to the simplification of the international accounting methods.

(6) A uniform method of designating international circuits has been decided on.

(7) A list of standard operating expressions in the different European languages is in course of preparation.

(8) A travelling Committee is investigating the conditions under which the traffic to and from financial and commercial exchanges (which at present forms the bulk of the international traffic in Europe) is handled at the various European centres.

It is necessary to emphasise the fact that the decisions of the C.C.I. have no binding force until adopted at an International Telegraph Conference, but in practice they are being generally accepted and incorporated in the working arrangements.

The C.C.I. has devoted an enormous amount of time to the consideration of engineering problems, but they cannot, for obvious reasons, be dealt with in this paper. Mention should however be made of the epic struggle on the question of the adoption of an international transmission unit. The American Telephone & Telegraph Company sent delegates to Paris to assist in the deliberations on this important question. The value of the contact thus established between the American Company and the C.C.I. will be apparent to all interested in the development of international telephony.

Another highly important matter in which the American Telephone & Telegraph Company co-operated, was the question of establishing a Standard Reference System for the purpose of enabling the European Administrations to standardise their apparatus in accordance with agreed data. The American Company actually presented to the C.C.I. the necessary apparatus and it has been installed in Paris under the supervision of a special Committee, the Chairman of which is a British Post Office Engineer.

The C.C.I. has also established contact with the International Union of Wireless Telephony.

The present organisation of the C.C.I. is of a comparatively simple character. There is a President who is elected annually. There is a General Secretary, with Assistants more or less specialised on various aspects of the work, who has his Headquarters in Paris.

The C.C.I. meets once a year at a centre determined at the preceding Conference. At each Conference subjects for special study are selected and the work of discussing them is confided to a number of Committees of Rapporteurs, each of which appoints a Principal Rapporteur to act as Convener and Chairman. The reports of these Committees are circulated to all administrations connected with the C.C.I., and form the basis of the discussions at the Annual Conferences.

The accounts are audited annually by selected delegates and the expenses are divided between the various countries in accordance with population. For this purpose the countries are divided into 6 classes, those in the first class each paying 25 units and those in the sixth class 3 units.

It is doubtless realised that over and above the value of the technical and other work accomplished by the C.C.I., consideration must be taken of the value of the personal relations established between the administrative technical, and traffic staffs in the various countries in Europe.

At the 1925 Telegraph Conference one of the American delegates told Mr. John Lee that he had previously no idea of the complexity and difficulties in the way of establishing a long-distance telephone service in Europe. The progress made during the past few years must be attributed largely to the bond of fellowship and the spirit of co-operation established at the meetings of the C.C.I.

A considerable measure of the success attained must be attributed to the enthusiasm of Monsieur Valensi, the Secretary-General.

TRANSATLANTIC SERVICE.

But there is still another international telephone service in which the British Post Office is concerned, viz., the service with America.

After the demonstration of speech from New York to London by the American Telephone & Telegraph Company in 1923, the technical experts were convinced that the establishment of a both-way service across the Atlantic was only a matter of time. As a matter of fact, two-way conversation first took place in February, 1926, and a month later a successful demonstration of this great achievement was given to Press representatives in London and New York. The public service was opened on Jan. 7, 1927, after a preliminary trial for a month or so by officials of the British Post Office and the American Telephone & Telegraph Company respectively.

Notwithstanding the publicity given to the enormous developments in scientific matters generally during recent years, few events have so much excited the interest of the public as did the opening of this service and the efforts of subscribers on both sides of the Atlantic to obtain the first call caused the authorities a certain amount of embarrassment.

* Paper read before the Post Office Telephone and Telegraph Society of London.

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From the official standpoint the opening of the service had an interest of an exceptional character inasmuch as it involved the establishment of working relations between the British Administration and the American Telephone & Telegraph Company.

The Agreement relative to this service between the Postmaster-General and the American Company is of a comparatively simple character.

It provides for calls of a minimum paid duration of 3 minutes and a maximum duration of 12 minutes, but calls of longer duration may be permitted if the exigencies of the traffic allow.

For the purpose of fixing charges, the United States are divided into 5 Zones but Great Britain and Northern Ireland constitute one Zone for charge purposes.

The service is a full " person to person " service, under which a particular person at a telephone station on either side may designate the actual person (or a substitute) to whom he wishes to speak at a particular telephone station on the other side. The call is not timed to commence until both the persons specified are ready to speak.

The total amount of the charges (apart from the additional charges for calls to distant Zones) are divided equally between the British Post Office and the American Telephone & Telegraph Company. The Zone charges are retained by (or credited to) the American Company.

The service was extended to Cuba some months back and to 5 of the Canadian Cities (Ottawa, Quebec, Montreal, Toronto, and Hamilton) on Oct. 3.

It will be extended to various European countries in the immediate future.

In view of the high charges for calls quite exceptional measures are adopted for the control of the traffic, and three operators are engaged simultaneously in this work at each end of the circuit. One is an engineer who controls apparatus which enables him to adjust the volume of speech to meet the conditions of individual calls. The other operators are telephonists, one of whom, known as the control telephonist, establishes communication between subscribers, times the calls, advises each calling subscriber of the expiration of each period of 3 minutes, and keeps a record of the quality of speech during each 20-second period of connexion. The other telephonist, known as the advance calling telephonist, obtains the particular persons required, holds them in readiness and keeps them informed of reports received from the other side.

The circuit is at present open from 12.30 to 11 p.m. (British time) 7.30 a.m. to 6 p.m. (New York time).

The accompanying diagram D shows the volume of traffic (represented in chargeable minutes) week by week since the opening of the service. About 50% of the traffic is of a social character and during the tourist season the percentage of such traffic was about 65%.

The call of longest duration was for a period of 44 minutes.

The circuit has been used by the British press for reporting special events as, for example, Major Seagrave's motor speed trials in Florida.

During December there were 25 calls between Great Britain and Canada.

On Christmas Day no less than 44 calls were dealt with, 16 outgoing from this country and 28 from America. The number of chargeable minutes

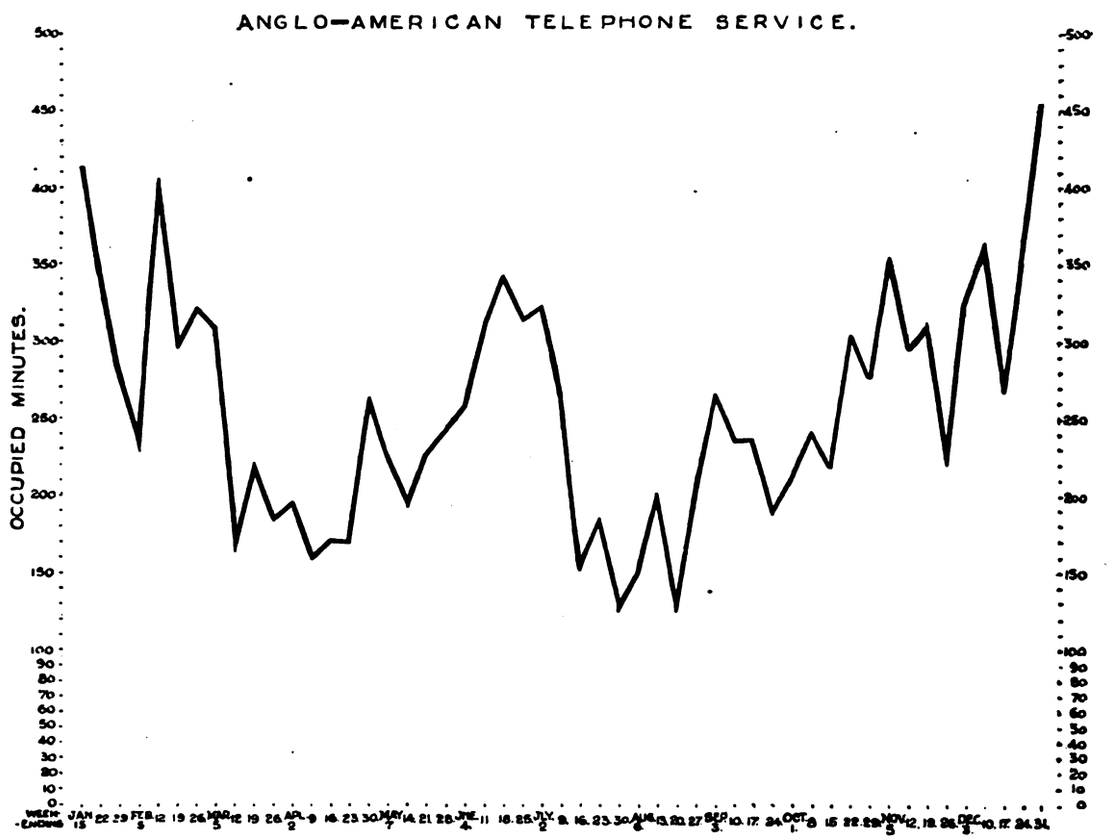

DIAGRAM D.

was 273 and the revenue £1,250. Among the calls successfully handled were the following :—

Wilmington	to	Walton-on-Thames.
San Francisco	„	Twigworth (Glos.).
Charleston	„	Luddendenfoot (Halifax).
Philadelphia	„	Radcliffe (Lancashire).
Uxbridge	„	Toronto.
Littlewick Green	„	Cleveland.
„ „	„	Montreal.

It is a pity in view of the general excellence of the technical arrangements that the channel is not more used by the commercial community but one ought not to despair, because it is understood that the traffic compares very favourably with that handled on the Transcontinental circuit in America in its early days and the charge for a unit call between New York and San Francisco is but 14 dollars as compared with the 75 dollars for a call between New York and London.

It is certain that in the immediate future further important extensions of the international telephone service will be made by means of wireless channels, and perhaps as our French colleagues are optimistic enough to think by means of submarine telephone cables of very much greater length than those which already exist. There appears to be no limit whatever to the possibilities, and the complete success which has attended the opening of the new services during recent years makes it certain that the responsible officials will not be found wanting, whatever may be the line of development.

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THE DETERMINATION AND DISTRIBUTION OF TIME.*

BY F. ADDEY, B.Sc., F.R.A.S., M.I.E.E.

THE smooth running of the complex modern world in which we live depends very largely on the keeping of correct time. But although it forms such an essential part of our daily lives there are probably few who have any idea how correct time is supplied. We set our watches by Big Ben, taking its accuracy for granted, and seldom give a thought to the organisation behind the clock by which that accuracy is obtained.

In the following article an attempt is made to throw a little light behind the scenes and to show how correct time is first determined and then distributed to the community.

In order to measure the passage of time we make use of some body in steady motion, and we determine equal intervals of time by equal distances moved through by the body.

The earth rotating on its axis is the most steadily moving body which is easily available to us for this purpose, and it is accordingly adopted as our fundamental timepiece.

The period of time taken by the earth to make one complete rotation, or the period of time which elapses between the instant when a star is due south at a place, and the instant when the same star is next due south at the same place, is taken as the fundamental unit of time, and is called a "sidereal day."

The sidereal day would, however, not be suitable as a unit of time for everyday life, because we have to regulate our lives by the sun. If at the beginning of the year, say, we agreed to start reckoning our sidereal days from a star which happened then to be in line with the sun (so that sidereal noon and solar noon coincided), six months later we should find that sidereal noon coincided with solar midnight, because, the earth, having passed over half of its annual journey round the sun, would now have the star and sun on opposite sides of it instead of their being in the same line.

In one year the earth makes 366¼ complete rotations on its axis, that is, there are in a year 366¼ sidereal days. These are measured by the apparent movement of a selected star round the earth from east to west.

Owing to the motion of the earth round the sun, the sun appears in a year to make one revolution round the earth from west to east. Thus, the total number of times the sun appears to move round the earth from east to west, due to the rotation of the earth on its axis, is one less than the corresponding number for a star, or the number of solar days in a year is 365¼.

For our daily life the period which elapses between two successive southings of the sun, called a "solar day," is used as the basis of our system of time reckoning.

The solar day is longer than the sidereal day, the difference being a little less than four minutes. The solar day is the longer because the earth is moving round the sun as well as rotating on its axis. If at a given instant the sun and a star are, for some place on the earth's surface, both due south, the star will again be due south at the same place when the earth has completed exactly one revolution. The star is so far away that the motion of the earth in its orbit while it is making the one rotation on its axis makes no difference to the apparent position of the star. But because the earth has moved forward a certain distance in its orbit while it has been making the rotation on its axis it will have to turn a little more than one complete rotation in order to bring the sun once more due south at the place considered.

Another way of looking at the matter is as follows. Because of the movement of the earth round the sun, the sun appears to move round the earth, from west to east. Therefore, if on a certain day the sun and a star happen to be due south together, the next day the star will be south before the sun, because the sun will have apparently moved a little to the eastward of the star during the preceding day.

The difference between sidereal days and solar days is not, however, constant throughout the year. As has just been explained, this difference is due to the displacement of the earth in its orbit, or the apparent eastward displacement of the sun among the stars. But the speed of the orbital motion of the earth is not uniform. The shape of the orbit is an ellipse with the sun at one of the foci. When the earth is in the part of its orbit near the sun it moves more quickly than it does when it is in the more distant portion of its orbit. Owing to this varying speed of the earth in its orbit the amount which the earth moves forward in a day, or the amount by which the sun apparently moves round the earth from west to east, also varies, and consequently the extra amount which the earth has to turn on its axis beyond one complete rotation in order to present the same place to the sun varies correspondingly. Thus the length of the solar day is not constant.

But even if the earth's orbit were circular, so that its speed round the sun were uniform, the length of the solar day would still not be constant. The axis of the earth is inclined to the plane of its orbit, so that as the earth goes round the sun, the sun does not appear to go round the earth along the line above the earth's equator, the so-called "celestial equator," but to follow a path which is inclined to the equator, being north of the equator from April to September, and south of the equator from October to March. It can be shown by simple spherical geometry that the motion of the sun in this inclined path would make successive solar days vary in length, even if the apparent speed of the sun round the earth were uniform.

The combined result of the two causes mentioned above is to make solar days sometimes longer and sometimes shorter than the average. The length of the average solar day is the time unit which is used for everyday life. Time reckoned on this basis is called "mean solar time," and if the place on the earth's surface which we have in mind when we are considering the successive southings of the sun happens to be Greenwich, then the time so determined is known as "Greenwich Mean Time."

The difference on any particular day, between solar time and mean time, is called the "equation of time." The value of the equation of time is given in almanacs, and is sometimes marked on sun-dials, so that the time shown by a sundial, which is the solar time at the place, can be converted into the local mean time.

For fundamental time determinations, as mentioned above, the sideral day is used. This is because a star can be observed more accurately than the sun, observations can be made on many stars and so one observation can be checked against another, and the complications due to the varying length of the solar day are avoided. It is, of course, necessary to select some star or its equivalent which, when it is due south, shall indicate the commencement of the sidereal day.

There is no particular star chosen for this purpose. Instead, that point on the sky is used when the apparent path of the sun during the year crosses the celestial equator from south to north, that is, the point where the sun is situated on March 21. The position of any star with reference to this point can always be determined, so that the sidereal time at which any particular star will be due south, reckoning zero time as the time of southing of the standard point mentioned above, is known. Thus, by observing the stars the true sidereal time can be determined, and so the error of the observatory clock, the amount by which it is fast or slow, can be found.

The observations are made by a telescope mounted so that it can be moved up or down, but cannot deviate from the north-south direction, that is, from the plane of the meridian. The eye-piece of this telescope is provided with a number of vertical cross wires. The telecope is set to the correct elevation for the particular star to be observed, and then, as the star passes across the field of the telescope due to its apparent diurnal motion from east to west, the times shown by the observatory clock when the star crosses each of the cross wires are noted. The correct sidereal time of crossing each wire is known by calculation, and so the clock error is determined.

Up to a few years ago the method used for carrying out this comparison between the clock and the stars was for the observer to signal to a recording instrument called a chronograph by pressing a key at the instant of transit across each wire. The chronograph consists of a slowly rotating drum covered with paper. As the drum turns, a pen, pressing on its surface, is slowly moved along its length by means of a screw, so that a spiral line is traced on the paper. This pen is moved sideways by an electro-magnet when the observer presses the key, so that the transits are recorded by displacement of the line. The observatory clock is also connected to the same electro-magnet, and records its seconds in the same way. A special signal, sent by the clock at the exact minutes, enables the clock time corresponding to any particular second mark to be determined. Thus, by examining the chronograph record afterwards the clock signals can be very accurately compared with the star signals.

This method has, however, the serious defect that different observers differ in their judgment as to the exact instant when a transit occurs. Some observers always signal a little too soon, others always a little too late. To eliminate the difficulties introduced by this "personal equation," as it is called, the "impersonal micrometer" was devised, and is now used at all important observatories.

In this instrument only a single vertical wire is used. This wire is not fixed but can be moved from one side to the other of the field of the telescope by means of a screw. As soon as the star comes into the field the observer brings the cross wire into coincidence with it, and by turning the screw keeps the wire in coincidence with the star during its passge through the field.

A wheel, carrying certain electrical contacts, is geared to the screw by which the wire is moved, and a spring pressing on the edge of this wheel touches one or other of the contacts when the cross wire reaches known positions in the field, the positions in which the fixed cross wires would have been situated in the earlier arrangement. Thus, the closing of these contacts corresponds to the signalling by the key of the transits of the star across the fixed cross wires previously used, but the contacts are made automatically, in fact, the observer is not aware when a contact is made. The contacts signal to the chronograph and cause the ink line to be displaced as already described.

By the impersonal micrometer the errors due to the varying personal equations of different observers are almost entirely eliminated.

The determination of the error of the observatory clock at the time when the observations are made would be of little use if the clock itself did not run regularly. By star observations made at different times the rate at which the clock is gaining or losing can be determined. If this rate remains steady the correct time at any instant can be obtained by applying the necessary correction to the time actually shown by the clock. The utmost

* Précis of a lecture given to the Post Office Telephone and Telegraph Society of London.

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ingenuity of clockmakers has accordingly been exerted to produce a clock of which the rate will be constant. There is no need for the clock to keep exact time, in fact, no clock ever does so, but the amount it gains or loses per day must be as uniform as possible.

The standard sidereal clock at Greenwich observatory is one of the "free pendulum" clocks devised by Mr. Shortt and manufactured by the Synchronome Company. This clock is a development of the Synchronome electric clock invented by Mr. Hope-Jones. In the Synchronome clock a weighed arm is released at each half-minute. In falling, this arm first gives an impulse to the pendulum, which keeps it swinging for the next half-minute, and then closes a contact which energises an electro-magnet by which the arm is automatically restored to its original position. This arrangement is called a "remontoir."

The pendulum, as it swings, has to actuate certain mechanism, which brings about the periodic release of the remontoir, and also has to close any necessary contacts for signalling the time to indicating dials, &c. This work prevents the pendulum swinging absolutely freely, and so interferes with its exact time-keeping functions.

To overcome this drawback, Mr. Shortt conceived the idea of separating the time-keeping duties from those of driving any necessary mechanisms. He provides two pendulums instead of a single one. One of these pendulums, known as the "master" pendulum, has no work whatever to do, except to continue swinging as regularly as possible. It receives an impulse each half-minute from a remontoir, but it does not release this remontoir itself. A second pendulum, known as the "slave" pendulum, performs all the functions of working the necessary remontoir and signalling mechanisms. At each half-minute the slave pendulum releases its own remontoir, and also the remontoir of the master pendulum. The latter remontoir does not drop, however, until the master pendulum is at the middle point of its swing. When it does drop, the contact which it closes to bring about its restoration to its position of rest, as described above, is also utilised to signal back to the slave pendulum and to work a device associated with that pendulum which automatically corrects it. The slave pendulum is arranged to lose slightly, and the correcting device accelerates it sufficiently to keep it in step with the master pendulum.

In order to make its motion as free as possible, the master pendulum is enclosed in an air-tight cylinder from which most of the air has been removed.

At Greenwich Observatory, the master pendulum is placed in an underground chamber, a relic of the old castle which previously occupied the site, and the temperature of this chamber is maintained as uniform as possible.

The rate of this free pendulum clock is so constant that, whereas with the sidereal clock previously in use it would have been unsafe to go more than a week without checking the clock with the stars, it would now be possible to go for two or three months without a check, and still to know the correct time. Of course, the clock is never allowed to go unchecked for such a long period. A number of star observations are made every clear night, but cloudy weather may sometimes last for several successive days, and it is then that the advantages become manifest of having a clock which can be relied on to run steadily over a considerable period.

As already explained, the time used in everyday life is not sidereal time but mean solar time—in this country Greenwich mean time. The sidereal clock can be any amount wrong, its error is constantly determined and allowed for, but the mean time supplied from Greenwich must be accurate. It would not be practicable in everyday life to apply a correction to the times shown by the clocks which are maintained at Greenwich time.

It is necessary, therefore, not only at frequent intervals to determine the error of the standard mean time clock at Greenwich, but also to have some means of correcting this error, so that the clock shall show correct time.

The error is determined by comparing the standard mean time clock with the standard sidereal clock. It has already been explained that the number of sidereal days in a year is one more than the number of solar days. The sidereal clock thus gains on the solar clock 1 day in $365\frac{1}{4}$ solar days, or 1 second in $365\frac{1}{4}$ seconds. This is approximately 1 second in 360 seconds, or 6 minutes. Hence every 6 minutes the sidereal and solar clocks get into step with one another, and tick together, while half-way between these periods of coincidence they are half a second out of step.

The comparison between the two clocks is made by noting the times which they indicate when they are in step. They then differ by an exact number of seconds, so that fractions of a second do not have to be estimated.

It is therefore known that a certain indication of the mean time clock corresponds with a certain indication of the sidereal clock. The error of the latter is calculated from the star observations and the known rate of the clock. Thus, the true sidereal time corresponding to the observed indication of the mean time clock is known. It is an easy calculation to convert the true sidereal time into true mean time. When this is done the true mean time corresponding to the observed indication of the mean time clock is known, and the amount by which this clock is in error is accordingly determined.

Fixed to the pendulum of the mean time clock is a magnet, the poles of which move over the ends of two coils of wire. By sending a current of electricity through these coils in one direction or the other the force exerted on the moving magnet can be either added to or subtracted from the force of gravity. In the former case the pendulum is accelerated and in the latter case it is retarded.

The length of time during which a current of given strength has to be sent through the coils to produce any desired correction in the time indicated by the clock is known. Thus, when its error has been determined the clock can at once be adjusted to show correct mean time. This correction is carried out before the transmission of every important time signal.

The mean time clock at Greenwich controls several electrical circuits. It drives the large 24-hour public clock placed in the Observatory wall by the main entrance. It sends a time signal once an hour to the Central Telegraph Office. This is used to synchronise clocks and to ring time gongs both inside the office and at the premises of subscribers to the time service. It also sends signals to the British Broadcasting Corporation on the last six second beats of each hour and half-hour. These signals are used by the B.B.C. for the six time signals which it radiates usually at 6.30 p.m. and 9 p.m., but which could, if necessary, be sent out at any other hour or half-hour as well.

At 10 a.m. a more extended service of time signals comes into operation. By means of automatic switches, controlled by clocks synchronised by the time signals, certain telegraph lines from the Central Telegraph Office to provincial towns, and certain lines from these towns to out offices, are, just before 10 a.m., disconnected from their telegraph instruments and joined to relays which are connected through to Greenwich. At the out offices the lines are extended through relays to indicating apparatus at the premises of subscribers to the time service. The 10 a.m. signal from the Greenwich mean time clock is thus distributed over the country.

The B.B.C. wireless time signals have already been mentioned. These perform a very important service in maintaining correct time throughout the community. But the most important service which is rendered by wireless time signals is in communicating exact time to mariners, by whom it is used for ascertaining their position at sea.

To determine the position of a ship it is necessary to know its latitude and its longitude. The determination of the lattitude is a comparatively easy matter, it may be done roughly with very crude appliances indeed, and more accurate determinations do not differ as regards the principle employed, but only as regards the greater refinement of the instruments and the tables used for the observations and calculations.

On the earth's equator, in latitude 0°, the celestial equator is exactly overhead, or it passes through the zenith. If we move through 10° northwards to latitude 10° N., the celestial equator moves in the opposite direction 10° southwards from the zenith. If we go to the north pole, latitude 90° N., the celestial equator is now on the horizon, or it has moved southwards 90° from the zenith. Similar changes take place if we move towards the south instead of towards the north. Thus, the latitude of any place can be determined by measuring how many degrees the celestial equator is displaced from the zenith, or as it is called, by measuring the "meridian zenith distance" of the celestial equator.

We cannot see the celestial equator on the sky, but the distances of the various stars, and of the sun, moon and planets, to the north or south of the celestial equator are known, and are published in the various nautical almanacs. Hence we have only to measure the meridian zenith distance of a suitable heavenly body, look up how far it is north or south of the celestial equator, and the addition or subtraction of this amount gives us the zenith distance of the equator. Actually, in practice, the angle of elevation of the body above the horizon is measured, the difference between this angle and a right angle is obviously the zenith distance desired.

The determination of longitude is a far more difficult matter. Longitude, or the angular distance at which a place is situated east or west of the meridian through a standard place, usually Greenwich, is determined by ascertaining the difference between the local time and the time at the same instant at the standard place. If noon occurs at New York about five hours after it occurs at Greenwich, it means that the earth has to turn for five hours after Greenwich has been brought opposite to the sun before New York is opposite to the sun. Since the earth makes a complete rotation, or turns through 360°, in 24 hours, it turns in 1 hour through 15°, or in 5 hours through 75°. Thus, the difference in longitude between London and New York is about 75°.

It is easy, by comparatively simple observation to determine the local time at a place. The real problem is to find out what is the corresponding local time at the standard place. This problem is so difficult that up to about three hundred years ago it was, for navigational purposes, considered as impossible of solution. Galileo, soon after his discovery in 1610 of the eclipses of the satellites of Jupiter, suggested that the standard times at which these would take place should be calculated beforehand and published, so that the satellites could be used by mariners as a clock. Although this method is practicable, though not very accurate, for use on land, it proved to be useless at sea, owing to the difficulty of making the observations from a moving ship. Later on the suggestion was made that the moon should be used as the hand of a gigantic clock, of which the figures on the dial were the stars, and that the standard time should be determined by observing the position of the moon among the stars as it moves in its monthly journey round the earth. This method also proved impracticable at first, owing to the absence of sufficiently accurate tables of the moon's motion. It was to supply this information that Greenwich Observatory was built by Charles II in 1676. The method of determining the standard time in this manner, known as the method of "lunar distances," is not very accurate, and it involves somewhat intricate calculations, for owing to the nearness of the moon to the earth her apparent position among the stars at any instant is different according to the position of the observer, and before the observations can be compared

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with the tables they must be reduced to give the position of the moon as it would appear to an observer situated at the centre of the earth.

The method of lunar distances continued, however, to be employed as an auxiliary to more improved methods up to a few years ago.

The most obvious solution of the longitude problem is, of course, to provide a clock which will give true Greenwich time, after the necessary corrections for error and rate have been applied. Unfortunately, however, this is by no means an easy thing to do.

In 1713 the British Government offered a prize of £20,000 for anyone who could construct a clock suitable for use at sea which would determine the longitude within 30 miles.

A clockmaker named John Harrison, who was the son of a Yorkshire carpenter, and who commenced by working at his father's trade, succeeded in making a chronometer in 1761 which, after it had been taken on a voyage to Jamaica and back, determined the longitude of Portsmouth within 18 miles, and so won the prize. Since then the marine chronometer has been still further improved, and to-day it is an instrument of truly marvellous accuracy.

But although the chronometer has been so highly developed it cannot, of course, be depended on to keep an absolutely steady rate and every opportunity has to be taken when in port to check its indications from the time signals, such as time balls or time guns, provided by astronomical observatories. As a guard against the danger which would result if a chronometer went wrong at sea and the error were undiscovered, it is usual for all important ships to carry three chronometers which are compared one with the other.

The advent of wireless telegraphy has immensely simplified the problem of the determination of longitude. Observatory standard time signals are now sent out at different times of the day from many high-power wireless stations, so that a ship can keep her chronometers under constant check. In fact, with the facilities made available by wireless telegraphy for ascertaining standard time at frequent intervals, a good watch will now serve for determining longitude where formerly an expensive chronometer was necessary.

The clock installation at Greenwich for supplying the time signal which is broadcast from Rugby at 10 a.m. and 6 p.m. consists of a Shortt free pendulum master clock and slave, adjusted to keep mean solar time. These clocks can be compared with the standard sidereal clock, and their error corrected by an electro-magnetic device exactly as already described for the ordinary mean time clock. The signal sent out from Rugby consists of a series of dots lasting from 9.55 a.m. till 10 a.m. and from 5.55 p.m. till 6 p.m., the intervals between the beginnings of the dots being 60/61 seconds in length, with half-second dashes instead of dots at the exact minutes.

By having the dots spaced at less than a second interval the wireless signals periodically come into step with the beats of the chronometer which is being checked. By noting the time shown by the chronometer and the number of the dot at which coincidence occurs it is possible by an easy calculation or from tables to ascertain the error of the chronometer to an accuracy of one-sixty-first of a second.

These signals are sent from Greenwich by a special pendulum, also supplied by the Synchronome Company, which is controlled by the free pendulum mean time clock and which is corrected electro-magnetically at the same time as the correction is applied to the free pendulum clock. The mechanical and electrical devices necessary to send the combination of dashes and dots described above are very complicated, and Mr. Hope-Jones is to be congratulated on the ingenious manner in which he has met the requirements which the signalling clock has to fulfil.

The commencement of the Rugby time signal at the end of last year marks the latest step forward in the methods used for the distribution of time. The hope has recently been expressed by a leading astronomer and geographer that at no distant day Rugby may broadcast a time signal every hour instead of only twice a day, and that ultimately, from a special wireless station, the beats of the pendulum of the Greenwich mean time clock may be broadcast continuously, day and night, so that at any time and at any place an observer will be able to compare his clock with the standard clock at Greenwich and so ascertain correct Greenwich time.

THE REPORT ON INLAND TELEGRAPHS.

THE Hardman-Lever Report on the Inland Telegraph Service, which was signed on Jan 12 last, was presented to Parliament by the Postmaster-General on March 19, as Command Paper 3058.

The following is a summary of the recommendations of the Committee :—

"(1) The extensive rights of appeal at present allowed to the staff should be restricted.

"(2) Closer control should be kept over the authorised establishment and revisions of staff effected at shorter intervals.

"(3) A reduction in the number of supervising officers is necessary.

"(4) Much of the work should be down-graded.

"(5) The present rotation of duties is excessive and should be curtailed.

"(6) Careful and detailed enquiry is desirable into the "walk" system of delivery. If it is retained there should be frequent and systematic studies for the revision of "walks" at regular intervals.

"(7) A first class engineer with administrative experience should be added to the staff of the Engineering Department.

"(8) A freer use of the Telephone Trunk System should be made for the transmission of telegrams during the less busy hours, the Telegraph Service being debited only with the operating charges where existing Trunk circuits can carry the traffic without serious inconvenience.

"(9) The possibilities of overcoming the maintenance difficulties of start-stop apparatus should be carefully examined.

"(10) A speeding-up of the abolition of Morse working would be advantageous.

"(11) The Post Office should concentrate on fewer types of apparatus.

"(12) Studies of the concentration of traffic should be steadily pursued.

"(13) Real attempts should be made to stop the decline in traffic by making the service more speedy and attractive, by withdrawing irritating restrictions, by extending its scope and by increased publicity.

"(14) The effect of any increase in tariff should be carefully considered. If an increase is decided upon, the most suitable tariff for ordinary inland telegrams appears to be a fixed charge of 1*s.* 1*d.* plus ½*d.* per word, with a rebate of 3*d.* on each telegram handed in between the hours of 2 p.m. and 9 a.m.

"(15) The abolition of the inland rate for telegrams between Great Britain and the Irish Free State should be considered.

"(16) The copy rate for Press telegrams should be confined to messages for addresses in the same town. The tariff for Press night wires should be substantially increased, and the ordinary Press tariff raised from 1*s.* to 1*s.* 4*d.*

"(17) Studies should be made of Imperial and Foreign methods. Personal visits for this purpose of the administrative heads together with technical officers should be encouraged."

PROMOTION OF MR. A. L. BARCLAY.

THE Traffic Office of the North-Western Telephone District, District Manager's Office at Preston, presented a gay scene on Friday evening, Feb. 24, when over 100 members of the telephone staff, including Supervisors and Telephonists from most of the larger exchanges in the district, together with representatives from other branches of the Post Office, assembled to bid farewell to Mr. A. L. Barclay, late Traffic Superintendent, Class I, and to congratulate him on his promotion to the position of District Manager, North Wales District.

The Surveyor, Mr. Randal Bell, who attended at some personal inconvenience, was unable to remain during the whole of the proceedings, but he extended his best wishes to Mr. Barclay personally, and expressed the hope that all present would spend a happy evening.

After a daintily-served tea had been disposed of, the subsequent proceedings were presided over by Mr. Morgan, Traffic Superintendent, Class II, in the unavoidable absence of Mr. Allen, the District Manager. Letters of apology for non-attendance from the Postmasters of Blackpool and Ormskirk, were read by the Chairman. Amongst the guests present were Messrs. Shackleton (Superintending Engineer), Terras (Assistant Superintending Engineer) and Upton (Sectional Engineer), whilst the Postmasters of the District were represented by Messrs. Vity (Preston), Sunley (Bolton), Elliott (Burnley) and Rankin (Chorley). Mr. Whitelaw, District Manager, Manchester, also put in a welcome appearance and was given a hearty reception by his late staff.

In a happy little speech, Mr. Morgan presented to Mr. Barclay a handsome Wireless Set, complete in every detail, which had been subscribed for by the staff as a tangible token of their esteem, and complimentary references to Mr. Barclay's sterling qualities, both officially and socially, were afterwards made by Mr. Allen (via Morgan), Messrs. Vity, Shackleton, Whitelaw, Upton and McLarty (Staff Officer on behalf of office staff).

Mr. Barclay, in responding, thanked the staff for their tangible espression of esteem and said how much he appreciated the kind words which had been spoken. He paid a tribute to the loyalty and support he had received from the Traffic Staff and all other sections of the Service, and said that he considered that his success was a recognition of the work performed as a whole by the North-Western Section.

Dancing interspersed with songs by Miss Priestley (Assistant Supervisor, Southport), Miss Walsh and Miss Cross (District Office), was afterwards indulged in, and a delightful evening terminated with the signing of "Auld Lang Syne."

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PROGRESS OF THE TELEPHONE SYSTEM.

THE total number of telephone stations working at Jan. 31, 1928, was 1,605,154, or 6,980 more than at the end of the previous month. Gross new stations added during January numbered 20,852, and ceased stations 13,872.

The growth for the month is summarised below :—

	London.	Provinces.
Telephone Stations—		
Total at Jan. 31	568,716	1,036,438
Net increase for month	3,126	3,854
Residence Rate Subscribers—		
Total	129,063	206,942
Net increase	1,342	1,736
Call Office Stations—		
Total	5,111	18,521
Net increase	42	87
Kiosks—		
Total	772	3,552
Net increase	39	89
Rural Party Line Stations—		
Total	—	10,148
Net increase	—	—
Rural Railway Stations connected with Exchange System—		
Total	—	856
Net increase	—	2

The number of inland trunk calls made during December,1927 was 8,649,082, bringing the total number for the year up to 99,978,429 ; this figure represents an increase of 7,318,534, or 7.9% on the total for the year ended December, 1926. Outgoing international calls made during December, 1927 numbered 27,592, and during the year ended December, 1927 320,586, an increase of 55,537, or 21.0% on the previous year's total.

Further progress was made during the month of February with the development of the local exchange system. New exchanges opened included the following :—

LONDON—

PROVINCES—Leek, Leicester, Oxted (automatic), Syston, Western Park, Wigston (automatic sub-exchanges).

and among the more important exchanges extended were :—

LONDON—Hendon, Hounslow.

PROVINCES—Dorking, Gatley, Herne Bay, Heswall, Leigh-on-Sea, Mansfield, Oldbury, Ramsgate, Rockferry, Sevenoaks, Tonbridge, Whitchurch, Whitehaven.

During the month the following additions to the main underground systems were completed and brought into use :—

Brighton—Lewes (Section of Brighton—Hastings cable).
Bradford—Shipley } (Sections of Bradford—Airedale cable).
Bradford—Keighley }
London—Uxbridge.
Manchester—Rochdale No. 3.

while 61 new overhead trunk circuits were completed, and 80 additional circuits were provided by means of spare wires in underground cables.

MAYFAIR.

MAYFAIR is doomed.

Such was the expression used by Barling after we had completed our inspection of the kiosks in the streets of Mayfair. Barling, as you would gather from the references to him in the article on Bloomsbury, is not given to exaggeration of statement. At the moment I cannot, indeed, recall any subject on which he shows positive animation or anything approaching to it. On official matters he is invariably cool, clear, and concise, which is, of course, as it should be. On architecture, his principal hobby, he will talk interestingly, but not enthusiastically. Golf, his sole outdoor recreation —a game which lends itself to more picturesque phraseology than any other, which will at one moment drive a man down to the lowest depths of despair, and the next raise him to the highest heights of optimism—he plays, and talks about, unemotionally. The other day, I remember, when we were playing to the fifth hole, he started with a badly sliced drive, followed with a couple of unimpressive iron shots which landed him well into the rough on the right of the fairway, extricated himself with his mashie in a manner which would have done credit to Vardon, only to fail badly on the green with a simple 2-ft. putt. In all these operations—and this is what I want to bring out—he preserved the same impassive demeanour. Not a sound escaped his lips, not a twitch of the eyelids, not a tremour of the lips indicated that he was undergoing experiences calculated to try the strongest character. It will readily be admitted that, when a man with such command over his emotions gives vent to a strong and sweeping statement, his utterance merits more than superficial examination.

Barling's statement, of course, was called forth by the serious, and, to a mind such as his, distressing alterations in character and architecture which have recently taken, and are still taking, place in the district. Not so many years ago, Mayfair, by which I mean the clear-cut parallelogram between Regent Street, Piccadilly, Park Lane, and Oxford Street, was practically unaffected by the wave for modernity which was sweeping over other neighbourhoods. Its noble squares, of which Grosvenor and Berkely Squares are the best known, impressed with their air of aristocratic dignity and charm. Its western boundary, Park Lane, was untouched by the hand of the modern builder. Regent Street, on the east, was definitely Georgian. In between were quiet streets with queer corners, and Queen Anne and Georgian houses with irregular roof lines, all having an atmosphere redolent of a century and more ago.

The definite crumbling of Mayfair began, I should say, with the falling in of the leases in Regent Street, its eastern boundary, which now, with its high new buildings of concrete and plate glass, has lost its old charm and grace, and bears the factory look and expression of a second Kingsway. Then followed the demolition of Devonshire House on the South, and the erection, on the vacant site and on the extensive grounds, of aggressively modern buildings accommodating some half-a-dozen motor show-rooms, with flats above them, and—a little way up the widened Berkeley Street, and within a stone's throw of what was, perhaps, the most exclusive square in London—a large modern hotel. The commercialising process of this south-eastern corner of Mayfair was powerfully assisted by the shifting of the motor industry, which, starting in Long Acre, moved westwards to Great Portland Street and is now firmly entrenched in Albemarle Street and Piccadilly. On the west, Park Lane is being savagely attacked. Grosvenor House, formerly the residence of the Duke of Westminster, bought, but, I think, never occupied, by the late Lord Leverhulme, which, with its grounds, occupied the whole section of Park Lane between Mount Street and Upper Grosvenor Street, has gone, and Dorchester House, a beautiful mansion in the Italian style, a little further south, is in the market, where, I am told, the rest of the Park Lane mansions will be very shortly. On the Grosvenor House site a huge new building, in which a *pied-à-terre* of one room may be had for a rental of £200 a year and a flat of eight rooms for £2,200 a year, has been erected. The demolition of the old historic mansion, and the erection of flats and shops on the site, has been referred to in the Press as the greatest innovation in two centuries of Mayfair history.

It seems that the whole of Park Lane is destined in a few years' time to be a street of shops and flats. I have been shown a picture of the new Park Lane. Aesthetically and architecturally the change will be definitely for the worse. The new buildings will be huge skyscraper structures with little pretence to architecture, and their rigid perpendicular lines will take away appreciably from the look and amenities of the Lane. One sees frequently in architectural and other journals references to what is termed the "zoning" system of building, each storey being terraced back from the one below. It is a system, it appears, which has been adopted with advantage in towns where space is so restricted and valuable that high buildings must be erected, but where it is desired at the same time to preserve to the eye the width of the road and to give the maximum of light and air. Here in Park Lane, it seems to me, was an excellent opportunity of introducing some such system.*

* Mr. Howard Robertson, Principal of the Architectural Association School of Architecture, in a recent work, states that schemes of "zoning" have within recent years been adopted in New York, high buildings being put back in successive stages, an arrangement, he says, which permits of a variety of powerful and even dramatic effects.

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In the centre of Mayfair the same commercialising tendencies are in evidence. Shops and offices have sprung up at the eastern end of Bruton Street, the aristocratic thoroughfare leading from the middle of Bond Street to the east side of Berkeley Square. Brook Street, where the small but famous and exclusive Symonds Hotel, the home from time to time of foreign potentates and royal visitors, is destined soon to be converted into a business house of offices, shops, and show rooms, is taking part heftily in the game. Shops are extending along Mount Street, which runs into the centre of Mayfair from Park Lane. Streets such as South Audley Street and Duke Street, running south from Oxford Street to Grosvenor Square, are now almost entirely occupied by tradesmen. Shops, I am told, will shortly be seen in Grosvenor Square itself.

All this is very distressing. There are, however, other points of view than the sentimental one. There is the point of view of the man who sees in the erection of palatial shops and show rooms a sign of commercial progress. There is the point of view of the man who believes that the day of individualist dwellings is over, and who sees in the spread of service flats and hotels a sign that we are rapidly and rightly approaching the time when we shall live in the community style. There is the point of view, to come nearer home, of the telephone development man. I spoke to a colleague responsible for the forecasts of telephone development in Mayfair. He told me that it was a distinctly *improving* area. He added that the Department would do well out of it. I looked at his forecasts. They showed high figures, figures which reflected—very properly—the changes taking place and contemplated. There seemed no doubt that the Department would do well out of the new Mayfair.

It is right to say, before leaving the subject of these building changes and developments, that here and there a change has been made which might be regarded as for the better, here and there a building has been erected which might be regarded architecturally as an improvement on the structure which it has replaced. Generally, I think it will be admitted, the new type of office and shop, the type common in Kingsway, the type which has sprung up in Piccadilly and Berkeley Street, and which is springing up elsewhere in Mayfair, fails to please the eye, although frequently it is not easy—for the laymen in architecture—to say exactly why a building displeases, or fails to satisfy, or stimulate. Students of architecture will tell you that the chief defect of the modern commercial building is the large amount of space given to windows on the lower floors, the "voids," in the shape of windows and doors, dominating the "solids," or stone surfaces, and so conveying an an impression of inadequate basic support, an impression of instability and insecurity. Another criticism heard is that seldom is there any attempt at functional design, seldom is an effort made to express architecturally the function or purpose of the building, to indicate externally what is going on inside.

A pleasing exception is to be found in the structure which has recently been erected at the corner of Old Bond Street and Burlington Gardens for a well-known and old-established perfumery firm. Here the ground-floor facade provides ample window space for the display of the merchandise of the business, while at the same time giving a suggestion of adequate support to the building, and there is a praiseworthy attempt at functional expression, the antiquity of the art of compounding perfumes and essences being conveyed by the mediaeval character of the bay projections, the Gothic arch on the Bond Street front, and the employment of gilded masonry on an abundant scale.

Another satisfactory expression of function is to be found in the building which accommodates the City of Westminster Public Library in South Audley Street, which, I may say, is the quietest and most pleasant institution of its kind in London. It has no newspaper room, but an adequate reference room, where you can dip into the history and geography of this and other neighbourhoods to your mind's content. If you should ever pay it a visit, ask the Librarian to let you see the old map showing Mayfair as it was two centuries ago—in 1725, to be exact. The map, we are told, was designed by one John Mackay, Mathematicians (the significance of the final "s" escapes me), of Saint James, Westminster. The main streets running north and south and east and west, with the two big squares, appear much as they are now. There are some changes in spelling and names. Park Lane is called "Hyde Park Lane." Audley Street does not appear, but a gap across the map is marked "Awdley," a spelling mistake, it would appear, on the part of the delineator, as the street, according to Wheatley and Cunningham, and other authorities, was called after Hugh Audley, a notorious money lender of the Inner Temple, who died "infinitely rich" in 1662. Two large mansions, marked "Earl of Burlington's" and "Earl of Sunderland's" are shown as occupying the space where the Royal Academy building stands to-day. The western part of Oxford Street, from about the top of New Bond Street to the Marble Arch, is called Worcester Road, and open fields stretched north of this road, extending over the ground now occupied by the Maison Lyons, Selfridge's, and other big Oxford Street shops.

It is necessary for men on the commercial side of the Telephone Service to take note of the changes which have taken place, which are taking place, and which may be expected to take place, in neighbourhoods served or to be served by telephone exchanges. In devoting attention to these features in connexion with Mayfair, I find I have left myself little space—within the imposed limits—to deal with those other new buildings, those small cast-iron buildings on concrete foundations, which the Post Office has erected in Mayfair during the past few years for the purpose of meeting the telephone needs of the public. These buildings are not many—seven in all. The number is few because, in this matter of kiosks, no district is so difficult to deal with as the high-class residential neighbourhood. A few years ago Mayfair was practically a barred area so far as kiosks were concerned. Now the Department is meeting with less difficulty. The commercialising of the neighbourhood has created a different atmosphere. It is safe to predict that, within the next few years, there will be an appreciable increase in the number of street kiosks in Mayfair.

The first of the Mayfair kiosks, starting from the east, is the one outside the Royal Academy, which, as everybody knows, has its entrance in Piccadilly. It has the distinction of being the best hidden kiosk in London. It stands behind one of the massive stone pillars at the gateway of Burlington House, and a foot passenger in Piccadilly might, in the day-time, pass and re-pass within a yard of it without becoming aware of its existence, though at night-time, when it is lit up, he could not fail to notice it. The Department would have preferred a site in Piccadilly itself, somewhere near the entrance to Burlington Arcade, but, as this was impossible to obtain, it accepted the present position as one which would cater—as indeed it does, very effectively—for Academy visitors. A point of interest is that, the site being a sheltered one and not subject weather stress, the Department was able to utilise here one of the original wooden models of the now familiar Gilbert Scott kiosk. Another point which I may mention before leaving it is that, according to strict Departmental definition, the structure is not classed as a kiosk at all, as it does not give a twenty-four hour service, the gates of Burlington House being closed at 11 o'clock at night.

A small strip of territory on the north side of Oxford Street, extending to Portman Square and Wigmore Street, is sometimes claimed to be included in Mayfair, and if this claim be admitted—Mayfair has no parochial or official recognition, and, therefore, no defined boundaries—mention must be made of two kiosks which have been erected in Vere Street, next door to St. Peter's Chapel, and opposite Marshall & Snelgrove's premises, which run back from Oxford Street along Vere Street. The position is an excellent one and the facilities afforded by the kiosk are in strong demand.

Grosvenor Square is at the moment barred to kiosks, but three have been provided in the vicinity, one in a by-way off North Audley Street, north of the Square, and two in Mount Street, south of it. Berkeley Square is also barred, but the changes on its south side bring it within the list of possible areas.

The situation and surroundings of the seventh and last kiosk of the series deserve more than passing mention. It stands in Shepherd's Market, the oldest and quaintest part of Mayfair, reached from Curzon Street and other surrounding streets by a number of curious irregular alleys. This is the spot where was held the old May Fair, the ancient fair which took place in the month of May, which dates from the time of James II, and which, "leading to evil ways," as an old record quaintly expresses it, was eventually suppressed. It is a delightful old-world spot, with the aroma of "Merrie England" still permeating it. The names over the old inns—"Laura Lee," "Ye Grapes," and "The King's Arms"—take you back into the times of the Stuarts. "Nell Gwynn" is painted over a little shop as you enter on the western side, and there are doors and gables and window sills in green and blue and red. The direct way to reach this hidden corner of London is by way of Piccadilly and White Horse Street, a narrow winding street turning off Piccadilly, a door or two past the Naval and Military Club. A more interesting way, and one which will impress you with the changes taking place on this side of Mayfair, is to turn up Berkeley Street, at the foot of which Devonshire House formerly stood. In the new and widened Berkeley Street you will inhale the Kingsway or modern commercial atmosphere. After passing the recently erected Mayfair Hotel, turn along Lansdowne Passage, a stone alley cut through the gardens of Lansdowne House, a palatial and historic mansion now occupied by the head of a famous Oxford Street store. At the other end of Lansdowne Passage you will emerge into the Georgian atmosphere of Curzon Street, and a little way along you will enter Shepherd's Market, with its pronouncedly Stuart atmosphere. The stately mansion—alas, poor Yorick! for sale at the moment of writing—at the north-west corner of the market, with its front in Curzon Street, is Sunderland House, built by the Duke of Marlborough, and a little way along on the other side is Chesterfield House, built in 1749 by the author of the celebrated "Letters," and now a royal residence.

In the Bloomsbury article I mentioned the total number of kiosks then existing in the whole of London. The number is now 780. That is the number shown by the records as existing on Jan. 31, 1928. On Jan 31, 1927, the number was 430, so that substantial progress in this particular branch of telephone work was made during the year and credit is due to the District Contract Managers, on whose shoulders falls the work of finding sites and of conducting the subsequent negotiations with local authorities, frontagers, subsoil owners, private property owners, the Minister of Transport, and various other persons, bodies, and Corporations who take an interest in things pertaining to the nature of street encroachments.

C. W. M.

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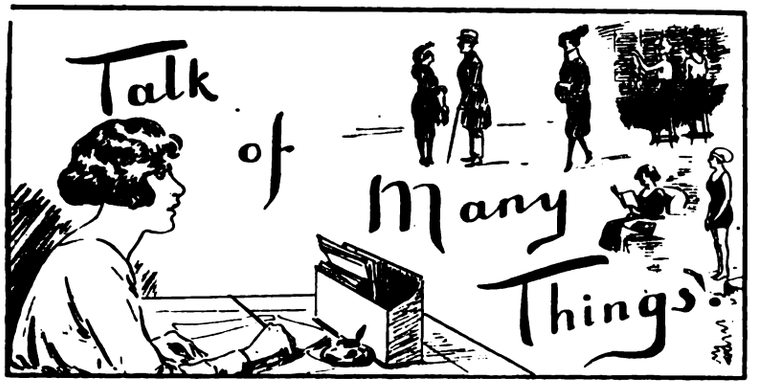
WE TELEPHONISTS



That Odontoglossum.

I HAVE had quite a large post this month, all because of that odontoglossum, and I have been surprised to find how many people know what it is and what it is not. I have heard from both institutions and individuals and they all write to the same effect—that the odontoglossum is not a mental state but a plant. Well of course, I knew that—I looked it up first; how else do you suppose I should have been able to spell it? Incidentally, have you ever noticed what wily birds botanists are? First they invent a most fearsome name for quite an ordinary plant and then, having spelt it out in full for you once, any further reference they make to it is by initial only. Thus they write about the Thalictrum glaucum, but when they want to refer to other members of the family do they write Thalictrum in full again? No! they do not; they merely write T. andiantifolium and T. aquilegifolium. It is either sheer laziness or orthographical weakness on their part, but in any case they have only themselves to blame. To adapt the words of the Duchess, "They only do it to annoy, because they know it teases."

But to return to the O. repercuss. and to my correspondents—I have heard from the Society of Pure Verbalists; the Prehistoric Order of Broth-blowers; the Raspberry Depipulators' Institute (with which is incorporated the Jam Pip Makers' Brotherhood, Ltd.), as well as from Anxious Mother, Pro Bono Publico, Paterfamilias, and Disgusted Reader. The brief answer to all these dear people is that I never said that I was suffering from O. repercuss., but that I was under the impression that this was how a friend diagnosed my condition. Still, it was nice to hear from them all and I hope they'll write again at Christmas and send me cards with robins and snow and the old, old wish.

Their letters, however, have caused me to reconsider my position and I am now quite sure that what I was suffering can only be adequately described by some such word. When repeated it seems to come bouncing by and to recede in gradually reducing billows until it fades into silence. It sounds like the rumble of remote thunder and reminds one of the appearance of waves on the seashore. It has a complete and all-embracing air of sufficiency and is the sort of word that brooks no contradiction. Having uttered it, one has expressed finality, and no more remains to be said. It is not soothing like the word Mesopotamia, but it is a lovely word and I shall regard it as the name of my recent affliction—whatever that was, and I can't just remember. Further protest, therefore, is useless. I am following the excellent example set by the late lamented friend of my childhood—Mr. H. Dumpty—as distinguished a philosopher as ever sat upon a wall and one held in high esteem by royalty and the army. I well remember the illustrated interview which he gave to Alice when she was on tour in Looking-Glass Land. He then said: "When *I* use a word it means just what I choose it to mean—nothing more or less." And again: "When I make a word do a lot of work—I pay it extra." Fortunately, in these more enlightened days, it is possible so to arrange duties that they can be included in the normal working week and extra duty payment is thus avoided.

So let the repercussive odontoglossum stand. PERCY FLAGE.

Telephone Staff Hospital Collections.

The Annual General Meeting in connexion with the Hospital Saturday Fund was held on Feb. 15, 1928. The meeting was well attended. Mr. Valentine was in the Chair, and he spoke with much appreciation of the good results shown by the yearly report. The collections for the year —£2,384—again constituted a record, showing an increase of £120 on the previous year's collections. This magnificent results can only have been achieved by much hard work and self-sacrifice; and, in view of the fallen bonus, it is particularly deserving of praise.

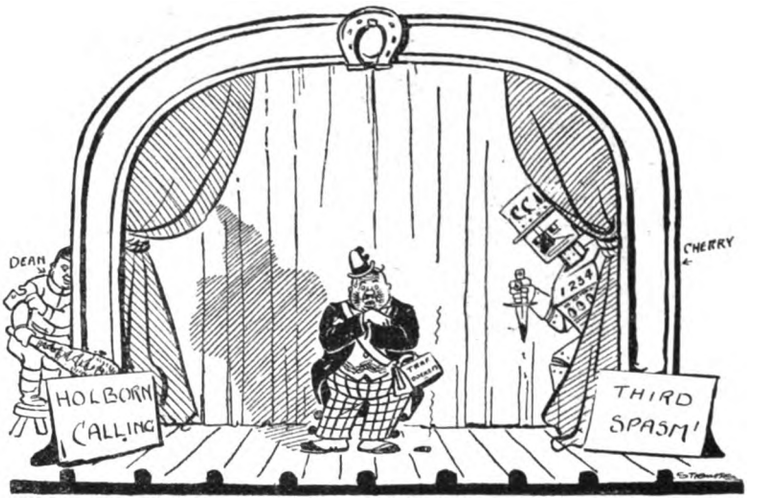
Mr. Valentine thanked the collectors for the good and faithful work done by them. Mr. Wakely, the Chairman of the Council, Mr. Caparn, the ex-Chairman, and Mr. Reed, the Secretary of the Fund, were also present, and they, too, expressed their thanks for and appreciation of the work done, which gives proof of the splendid spirit that permeates the staff of the London Telephone Service.

Miss Cox had a special word for the exchange staff, thanking them for their help in bringing the collections up to £2,000 and over.

Mr. Valentine was unanimously re-elected Chairman, and Mr. Page, Honorary Treasurer.

The Misses Reekie and Wormald were re-elected Honorary Secretaries, an election which every year becomes more popular, not only with those who put these two indefatigable workers in office, with wild acclamation, but with the two themselves. It is always refreshing and inspiring to witness their delight at being again chosen for what are, after all, very arduous duties. It is their enthusiasm, and that of kindred spirits, that crowns the efforts made with success.

Let us work on, then, with renewed courage—our slogan being: "£2,500 this year!"



[Adapted, with apologies, from "The Daily Express."

A SCENE FROM MISS MCMILLAN'S "HOLBORN CALLING," *vide p.* 168.

Paddington Exchange Tea and Entertainment.

Saturday, Jan. 21, 1928, seems a long way off now, but all the same the date will be joyfully remembered by a throng of nearly 300 boys and girls of the Capland Road L.C.C. School, who found themselves the favoured guests of the Paddington Exchange staff for the afternoon. The Paddington Exchange Tea and Entertainment is one of those recurring events which take their place in the Calendar with the Oxford and Cambridge Boat Race, the Eton and Harrow Cricket Match, Derby Day, &c., and time does not wither nor custom stale its infinite variety.

With lavish entertainment and a keen brigade of workers on the one hand, and a host of appreciative children on the other, success is assured from the moment the signal is given to "fall to."

The Tea itself was a triumph of the caterer's art and this year an additional touch of "home" was provided by tea being made fresh for each guest instead of the usual continuous stream from the urn.

The Rover Scouts, Christ Church, Fulham, who made such a decided hit at last year's entertainment, scored another well-merited success in their high-class turns with popular choruses, all of which received the full-throated support of the children, a complete "entente" having been rapidly established and sustained.

Mr. Beaumont, an artist in Wizardry, then took the audience into his confidence and in a humourous and easy vein did marvels in white magic and brilliant sleight-of-hand, the only trick which he failed to bring off being to get to the end of his inexhaustible stock of mysteries in the time allotted to him.

The finale having been reached long before it was welcome, the children were dismissed with suitable gifts dispensed by the ladies, who showed a quick eye for discrimination in handing out the goods, a super touch being added in the shape of new pennies and fruit.

The warm interest shown by many friends, far and wide, in this yearly effort is deeply appreciated by the Committee and this belated notice must serve as a grateful acknowledgment of so much kindness and generosity which makes the Paddington Tea such a real success. With this appreciation is coupled a hearty vote of thanks from all the children concerned.

A. R.

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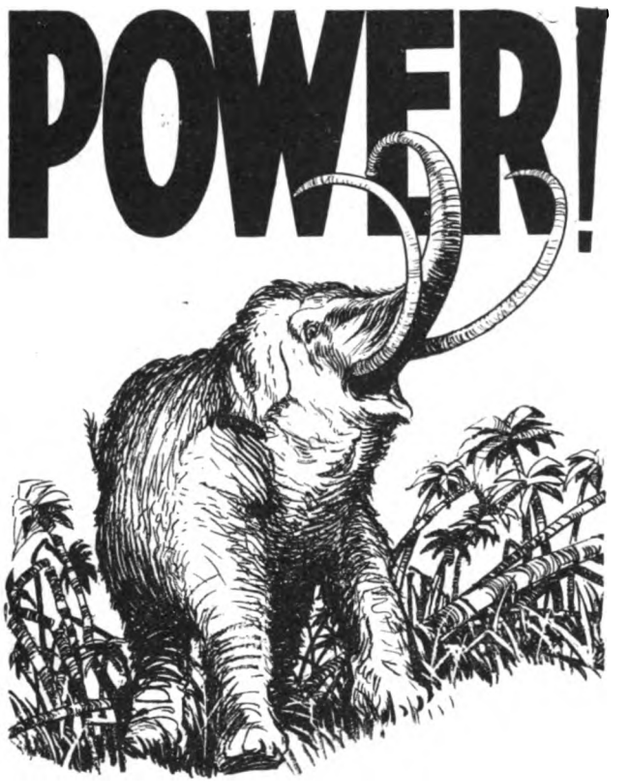

THE Mammoth, of Pleistocene times, was one of the most powerful creatures ever known to man, being possessed of colossal reserves of strength and endurance.

Our "Siemens" Super-Radio Battery can equally be classed as a Mammoth among present-day H.T. Batteries. No other H.T. Dry Battery can give such wonderful service and show such reserves of power and endurance; and withal it is made up in such a manner that it is of convenient size and shape, and has a very pleasing appearance. It looks what it is—a product of sound design and super-excellent construction.

SIEMENS
SUPER RADIO

Extra Large Capacity - for Multi-valve sets.

50 Volts Price **25/-**

AT YOUR DEALERS

Connect two or more in series for voltages of 100 and upwards.

A good set deserves a really good H.T. Battery — insist on Siemens.

SIEMENS BROS. & CO. LTD.
WOOLWICH, S.E.18.

Sydenham Exchange.

A very successful Dance and Whist Drive was held at the Dartmouth Hall, Forest Hill, on Feb. 7, 1928. It was the last social affair of the season, and was organised by the combined Tennis and Swimming Clubs.

Mr. Perkins kindly acted as M.C. for the dancing in the unavoidable absence of Mr. Townsend.

The Whist Drive, which was an experiment, justified its existence, and Miss Bowley presented the prizes to the lucky winners.

A bouquet was presented to Miss Arnott as a mark of appreciation for her splendid work. In reply to prolonged cries of "Speech!" Miss Arnott said that she was very pleased to have worked for Sydenham, and hoped to do more. The speech, like the speaker, was short and to the point, but nevertheless gave great pleasure to the staff, for it is this unassuming, self-sacrificing labour which is the foundation of all social work.

G. M. T.

Mountview Exchange.

On Saturday, Jan. 21, the staff at Mountview entertained 80 children from the Local Council Schools to a tea and entertainment at the Campsbourne School Hall.

In spite of heavy rain the visitors all arrived punctually; in fact, many were about an hour too soon, arriving about three o'clock.

The depressing weather had no effect on the spirits, and these early arrivals lustily sang choruses until tea was ready. Full justice was done to an excellent tea during which the arrival of Father Christmas was greeted with great applause.

After tea all settled down to be entertained by a conjurer and ventriloquist and by some pretty and clever dancing by little Miss Betty Bruce, a small sister of one of our telephonists.

Later in the evening Father Christmas distributed toys from a giant Christmas Tree, heavily laden and beautifully lighted with small coloured electric lights, towards which many hopeful glances had wandered during the evening. Many of the youngsters appeared to get the very toy—doll or book—for which which they had been longing.

On leaving, each child was also presented with a bag of sweets, an orange and apple. Everyone enjoyed the evening, the helpers perhaps quite as well as the children.

The thanks of all are given to Mr. Spiers (Father Christmas) and Mr. Haines, both of the Engineering Staff, for their ready and valuable assistance.

D. A. P.

Concert at Benenden.

The third concert organised by Miss M. M. Worth was given with great success on Saturday, March 3, to the patients at the National Sanatorium, Benenden, by the staff of the London Telephone Service.

Everyone enjoyed the singing and selection of songs rendered by Miss Nora Smith and Miss Phillis Pidgeon, Sopranos, Miss Ethel Williams, Contralto, and Mr. Hugh Williams, Tenor. Miss Winifred Shaw, Elocutionist, afforded much merriment with amusing monologues.

Trumpet solos exceptionally well rendered by Mr. H. A. Warton were received with much applause, and much hilarity was heard during the Scottish Character Humour given by Mr. Bob Douglas. Mr. A. C. Vincent at the piano added to the enjoyment with lively syncopation.

After the Concert, which concluded with community singing, Doctor Spurrier passed a vote of thanks to Miss Worth and to the Artists. He said this was the third concert given by the London Telephone Service and each one seemed better than the last, and were much enjoyed by the patients, who all wished to have the pleasure again.

Miss Worth, in reply, said it was owing to the generosity of her colleagues in the London Telephone Service that she had been able to arrange the concerts and wished to thank the artists for their willing support, especially Mr. A. C. Vincent, who had obliged each time.

The artists were entertained to supper, the Matron presiding. Mr. Hugh Williams, on behalf of the artists, thanked the Matron for the kind hospitality they had received.

F. D. B.

A contributor at Tottenham Exchange sends an interesting note to this column. She says: "If the Telephone Directories issued last year were placed flat one upon another they would reach to a height of 365 times that of St. Paul's Cathedral, and if placed end to end would extend for 143 miles—that is, from London to Birmingham and 23 miles beyond."

In these days of heavy traffic, we are amazed that our correspondent was able to get the books in position. What were the police doing?

On referring the matter to Mons. Flage, he expressed the opinion that if all the subscribers whose names appear in the Directory were piled in alphabetical order one on top of the other, the gentleman underneath would probably lose his breath!

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Central Exchange.

At the Central swimming social
That was held at Carter Lane,
Came a crowd of men and maidens
To enjoy themselves again.

Our Miss Millbank was the mover,
Organised the whole affair,
And they came from all exchanges
Just to meet their old friends there.

Midst the dancing and the frolic
"T. A. B." in accents clear,
Called aloud to all and sundry
"Now the artistes will appear."

Then a visitor, Miss Fordham,
Sang to us a sweet refrain,
But they would not rest contented
'Till she sang just once again.

After this the room was silent
'Till Miss Smith of concert fame,
Played a piece with skill and pathos
And "Finlandia" was its name.

Then Miss Morris and a star caste
Acted in a sketch "Mere man";
This the audience applauded
As a Central audience can.

There's no space to hymn their talent
But these few words I must say,
Everyone of these fair maidens
Gave a very good display.

Our best thanks to all the helpers
Volunteers from staff at C.
They all made the swimming social
Move along quite swimmingly.

D. D.

Contributions to this column should be addressed: THE EDITRESS, "Talk of Many Things," *Telegraph and Telephone Journal*, Secretary's Office, G.P.O. (North), London, E.C.1.

GLASGOW TELEPHONE NOTES.

THERE are occasions when words fail adequately to express one's thoughts. In this particular case it is impossible to convey to the readers just that exceptional atmosphere which prevailed at the valedictory meeting associated with the retiral of Mr. James Robertson, Traffic Superintendent Class II. There was a rare assemblage of personal and official friends from the Glasgow and Scotland West Districts at Reid's Cafe on Feb. 22, to do honour to the guest of the evening, and to present him and his good lady with some tangible tokens of esteem. Despite the "fly in the amber" as meant by one more official parting with an old and trusted colleague, the prevailing spirit was one of light and cheer. Perhaps this was to cloak the more serious thoughts that would persist in obtruding; be that as it may, we had all determined to be on our best behaviour and to come "Smilin' thro'." The proceedings consisted of a concert which was interrupted for the event of the evening—to wit, the presentation to Mr. Robertson of a grandmother clock and to Mrs. Robertson of a handbag and umbrella. Refreshments were then served and afterwards we resumed the concert. The quality of each item was of the best, and each was moreover rendered in delightful manner, the lapse of time alone prevented the encores demanded. Two of the best items were "Mr. Robertson" by Miss M. L. Tulloch, and "Cohen Calls the Contracts," a monologue by Mr. D. Reid. Members of the staff provided the full programme. The Chair was taken by the District Manager (Mr. A. E. Coombs), who also made the presentations. Messrs. Johnson, Lane, and Harvie, of the Traffic Branch, and Miss Cameron, of the Central Exchange, also spoke. Our guest, who was received on rising with musical honours, responded with characteristic modesty. He stated that he failed to recognise himself in the flattering portrait which the speakers had drawn of him. In rounded and well-chosen phrase, he returned thanks to the staff for their great generosity in making him such a handsome present, and also for the most acceptable gifts to Mrs. Robertson. There would be about 160 present, numbers being limited only by the accommodation. Miss McCallum and Mr. Harvie, of the Traffic Office, were responsible for the arrangements and right well were these carried out. Truly a red-letter night in the history of the Glasgow Telephones and one that was well worth while.

* * * *

Mr. Robertson.

Who is this lad so fine and tall,
That in his stride outstrips them all,
Who always runs at duty's call?
Boy James!

Who is this new telegraphist
Who "dots-and-dashes" with his fist?
Not one small item has he missed.
Why Jimmy!

Who is it now as overseer
Walks up and down? All feel him near,
But spite of that they have no fear.
Still "Jimmy!"

Who changed his course and steered for 'phones,
About his tactics made no bones?
'Tis better for him now, he owns.
Mr. Robertson!

Who after five years was promoted,
For being to his work devoted,
Whose ruling on most things was quoted?
"J.R.!"

Who came to see us day-by-day,
Who listened to us "say-our-say,"
Who helped and cheered us on our way?
Mr. Robertson!

Who leaves us now, his task completed,
To whom is now some leisure meted,
To take up golf? (language deleted!)
"The War Horse!"

Who are here met to wish him well,
Who on his virtues long could dwell,
But who instead, must say "Farewell"?
Each one of us!

M. L. Tulloch.

* * * *

The second, and probably the last, Exchange Staff's dance of the current season took place in the Waldorf, on March 5, when we all spent a most enjoyable evening, thanks to the energy and organising ability of Miss H.B. Mowat and her committee. If all is well, it is hoped to hold more of these events during the season 1928-29.

* * * *

Mr. J. G. Mackay, Assistant Traffic Superintendent, who has been on sick leave since July 1926 is, we are glad to say, making good progress, and we hope soon to have the pleasure of extending a welcome to him in a personal and official sense. John does not like forced inactivity and no one will be more pleased than himself when he gets back into harness.

* * * *

Mr. J. J. O'Rourke is the latest addition to the ranks of our young Traffic experts. He brings his native smile with him and we hope he will find many reflections of this during his stay with us, and that he will spend many happy official and unofficial hours with his Glasgow colleagues.

* * * *

Glasgow Post Office War Hospitals' Entertainment Committee.

On Tuesday, March 13, an entertainment consisting of tea, song, and music, was given to the Bellahouston Boys, by the Trunk Exchange staff. A feature of the musical programme was the spontaneous and hearty efforts, made in community singing, which the company seemed to enjoy. Our thanks are due to the following artistes, who ably contributed to make the evening a crowning success:—Miss Fullarton, L.R.A.M., was untiring in her efforts to satisfy the repeated calls made by the delighted company. Miss Richardson again charmed us with her violin; Miss J. Green, with her songs; Messrs. Hunter, Hamilton, and McClure, maintained their usual high standard of entertainment, while Miss Cree ably played the accompaniments. We have specially to thank Miss Kay for so gracefully presiding. The presence of our Supervisor (Miss Cemeron, Supervisor, Central, was also present), and other members of the Telephone staff is, in itself, an encouragement which tends to make "the carrying on of the good work" a greater joy and pleasure.

* * * *

Trunk Exchange, Glasgow.

Jean R. Scott, one of our most popular girls left the service on Friday, March 16, to go to Sydney. Jean was given a good "send off" that evening by some of her office friends, 25 of whom entertained her to tea in the Grosvenor Restaurant, where her virtues were extolled and our good wishes for her future expressed. After the singing of "She's a jolly good fellow" and "Auld Lang Syne," the party proceeded to the Alhambra Theatre, where an enjoyable evening was spent at the appropriately named "That's a Good Girl."

The staff presented Jean with a silver brush, comb, and mirror, and she also received many individual gifts. The committee of the Glasgow branch of the P.O.R.F., of which she was Acting Secretary, presented her with a handsome Vanderhilt bag. Jean served in France during the War with the W.A.A.C's. (Signals) and her ex-service friends throughout the Telephone Service will share our regret at her departure from this country, and she will carry with her to Australia their, as well as our, very best wishes for her future happiness and prosperity.

* * * *

Whoever was responsible for saying that the Scot takes his pleasure more sadly than the Englishman would surely alter his opinion if he had been present on Friday evening, March 16, at the whist drive and concert, promoted by the Douglas Exchange staff, and held in the dining room of that exchange

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by the kind permission of Colonel Westbury. Not to be outdone by the staffs of other exchanges, Miss Mortimer and her band of capable and willing assistants entertained a company of about 170 to an excellent programme, consisting of whist, tea, music and recitations. The guests included representatives from all sections of the Glasgow Post Office and Engineering staffs, and friends, among those present being Colonel and Mrs. Westbury; Mr. and Mrs. Coombs; Miss Kelly, of the Hope St. Post Office; Mr. Thomson, of the Survey branch (to whom we offer our heartiest congratulations upon his recent well-earned promotion), and Mrs. Thomson; Miss Cameron, of the Central Exchange, Miss Kay of the Trunk Exchange, Miss Fleming (Bell), Miss Wallace (Central), etc.

Colonel Westbury, in a short address, complimented the staffs concerned on the satisfactory result of the amalgamation of the Charing and Douglas Exchanges. Mrs. Westbury distributed the prizes for whist, the prize-winners being:—Ladies: Miss J. A. Brough, 1st prize; Miss Stirling, 2nd prize; Miss P. Parkinson, booby prize. Gentlemen: Mr. Gilchrist, 1st prize; Mr. Shearer, 2nd prize; Mr. Brunton, Booby prize.

The artistes were the Misses G. Glenny, A. B. Miller, and B. M. Taylor; and Messrs. G. C. Dewar and D. Reid, with Mr. A. M. Mellish as accompanist. Right well did they perform their respective parts in song or recitation, and so contributed to the enjoyment of a perfect evening. Mr. Coombs occupied the Chair.

"J.L."

LONDON TELEPHONE SERVICE NOTES.

Contract Branch News.

THE amount of business done by the Contract Branch during the month of February was as follows:—

	Stations.
New business obtained	9,654
Ceasements	3,391
Net gain ...	6,263

The net gain figure is a record—the previous highest figure being 6,200—obtained in October last year. The net gain for January last amounted to 5,590 and that for February, 1927, to 4,874. This year's record includes an order for a P.B.X. of 1,000 stations, which is one of the largest, if not the largest, P.B.X. order ever taken in this country. This is being installed in a new building which is being erected for a big industrial undertaking and it is thought that the ultimate requirements may be in the neighbourhood of 1,800 stations.

A total of 154 exchange lines were provided for the exhibitors at the Ideal Home Exhibition this year as compared with 133 lines last year.

An item of special interest to telephone people at this Exhibition is the stand of the Telephone Development Association, where two Contract Branch representatives attend daily to deal with telephone enquiries. Although the Exhibition has only run about half its allotted span when these notes are written, orders have already been taken for about 100 stations, and a large number of enquiries for lines both in London and the Provinces have been referred to the various Districts to be followed up.

* * * *

"Holborn Calling—and Other Trifles."

This alluring title, the possibilities it presents for the exercise of Miss McMillan's whimsical humour, and the certainty—based on past experience—that these possibilities would be fully realised, drew large and enthusiastic audiences to King George's Hall, Caroline Street, Tottenham Court Road, on March 1 and 2 last, when the telephone musical play with the title referred to, was given under the direction of Mr. Pounds.

As the title suggests, the play is a topical burlesque, in which the author, with charming impartiality, pokes good-humoured fun at all and sundry—traffic men, engineers, day staff, night staff and even the charwoman—in which rôle Miss Lilian Jones, known to most as a graceful and accomplished dancer, revealed a real gift for comedy.

From the topical standpoint, the automatic system, as exemplified at Holborn is the central idea of the play. Shrieks of laughter greeted the demonstration by a Traffic and Engineering Officer of the C.C.I. position, a veritable thinking-machine which advances and retires at the word of command; and on which, heralded by rattle of switches, hoot of motor-horn and ringing of bells, the wrong number always appears, until, in despair, the Traffic Officer suggests dialling the number last displayed. Then—with that almost human intelligence for which it is famous—the C.C.I. apparatus obligingly gives the number originally wanted!

> "And oh! for the pow'r that the Engineer can sway,
> And oh! for the Traffic man who makes us glad and gay,
> For the staff are so happy as these officers they scan,
> They admire the Engineer, the clever Engineer,
> And also the resourceful Traffic man!"

The crowded audience was convulsed with merriment at this and other similar "hits" at the more mirth-provoking joints in the Service armour.

Of course, there is love-interest. The principal telephonist (Miss Street), who is in love with the Traffic man (Mr. Hemsley), has run away from home to escape betrothal to a certain Dean (Mr. Beale), but discovers when the Dean visits the exchange that she was intended for his nephew (Mr. Whiffen), who in the meantime has conveniently fallen in love with another telephonist (Miss Lattimer), leaving the principal telephonist to the man of her choice. The Dean appropriately falls in love with the Supervisor (Miss Price), and even the Engineer (Mr. Williams), after his tragic realisation that the automatic system substitutes switches for girls, finds consolation in a charming incarnation of the Automatic Idea. All are thus mated, in accordance with the best traditions of musical comedy.

Excellent singing by principals and chorus was a feature of the production. Miss Street, as the principal girl, sang like the finished artist that she is. Mr. Hemsley, too, used his fine voice to great advantage; while his infectious humour and evident enjoyment of his rôle of the Traffic Officer with the "large Novello eyes" greatly contributed to the success of the performances. Mr. Williams, as the Engineer, also sang delightfully, as also did Mr. Whiffen as the Dean's nephew. Mr. Beale gave a finished rendering of the part of the Dean, while Miss Price impersonated the Supervisor with her unfailing ability and humour. A special word of praise must be given to Messrs. Cherry and Dean for their admirable switchboard background and for the irresistibly comic C.C.I. position, which will help to enable those who saw it to view through the kindly mists of humour the bewildering achievements of its Service counterpart.

There was some excellent dancing under the direction of Miss Jones, whose extremely graceful solo work formed a striking feature of the play. The accompaniments were in the able hands of Miss Garvey; and the charming costumes of the cast were, as usual, under the always artistic supervision of Miss Clayton.

Throughout the play applause and laughter were long and loud; and at the conclusion of each performance there were enthusiastic calls for the author, to whom floral tributes of appreciation were presented.

In response to a widespread demand, the play is to be repeated on April 10 next, at King George's Hall.

* * * *

Cricket and Football.

Since the last notes appeared under this heading 3 matches have been played, all of which have been won, and two of them were decided on opponents' grounds.

This excellent progress has raised the team within reach of the leaders, and seeing that the remainder of the programme includes matches with the leaders of the league, much depends on the results of these games. If the team can rise to the occasion they have more than an outside chance of heading the League and this would be a very creditable achievement for a club in its first year.

It was a good performance to visit Dollis Hill and win 2-1, but the match with the War Office, which at one time seemed likely to result in an easy victory, nearly ended in disaster, due to over confidence when enjoying a lead of 3 goals.

Although interest at the moment is centred on football, the prospects for the Cricket season have been under consideration and it is intended to continue the inter-branch games between the Contract, Traffic and Accounts branches, and dates have been fixed for the contests to be decided at Chiswick.

An invitation has been extended to the London Telephone Service from the Brighton Telephone Staff to send a cricket team to Brighton on Saturday, June 9 next.

The invitation has been accepted and those who wish to be included in the party are invited to get in touch with Mr. H. G. T. Adams, Traffic Branch, Ref. T MD.2a, 32, St. Bride Street, E.C.4.

It is proposed to travel by train from London Bridge and accommodation will be reserved for the party. The return fare is 6*s.* 5*d.*

It is hoped a large number will come, men and women, and make the outing a big success.

* * * *

Netball Competition.

The first round results for the trophy presented by Miss J. Liddiard were:—

Kensington	27	Central	4
AR3	12	AR2	2
AR6	23	Riverside	11
Thornton Heath ...	11	Croydon	10
Clerkenwell	20	AR1	8
Rodney (A), walk-over.			
AR7	13	Rodney (B)	11
AN and Address ...	16	Trunks	5

In the second round Kensington beat Clerkenwell 27 to 13, and the following matches have yet to be played:—

AR3 *v.* AN and Address.
AR7 *v.* Rodney (A).
AR6 *v.* Thornton Heath.

Arrangements have been made for the Final to be played at the Civil Service Sports Ground at Chiswick on Saturday, April 21.

The Civil Service Championship will be played the same afternoon.

Those wishing to be present may obtain tickets, price 6*d.*, from Miss Sanders, Controller's Office, Reference A.N.

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THE

Telegraph and Telephone Journal.

VOL. XIV. MAY, 1928. No. 158.

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TELEGRAPH AND TELEPHONE MEN AND WOMEN.

LII.

LT.-COL. A. G. LEE, O.B.E., M.C.

LT.-COL. A. G. LEE, Staff Engineer, whose portrait we give this month, was born in 1879 "in the purple," so to speak, for we believe his father was a Post Office Engineer. He entered the Civil Service as a Second Division Clerk in 1898, but we may assume that, even at the beginning of his career, he had his father's old Department as his objective, and after three years spent in the outer wilderness of West End Offices and the Post Office Savings Bank he achieved his ambition. He entered the Engineer-in-Chief's Office in November, 1911, as a Third Class Clerk, but his appointment was merely a stepping stone to the technical side, and in a little over a year he became a Second Class Engineer. Thereafter the fine scientific knowledge with which he had equipped himself, combined with his high personal qualities, took him rapidly up the official ladder. He became a Staff Engineer in 1925, and it is not likely that this will be the final rung.

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Lt.-Col. Lee, who served in the Royal Engineers Signal Service during the War, occupies a high position in the world of radio engineering. He is Chairman of the Wireless Section of the Institution of Electrical Engineers and also of the sub-committee of the Radio Research Board on "Atmospherics."

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BUSY-TONE RECORDS.

AMONG the activities of Contract Branches which are apt to be lost sight of by the uninitiated is one, which in view of its importance from a service point of view, is worthy of more serious attention. Busy lines, blocked to incoming calls, cause much inconvenience both to subscribers and to the Administration. So much is this the case that it is found necessary to include a clause in contract forms giving the Postmaster-General power to determine the agreement when a subscriber refuses to hire such additional exchange lines as are deemed necessary to meet the traffic requirements. Such course is followed in any case where over a period of 6 consecutive working days the number of calls to the subscriber when the circuit is found to be engaged is more than 25% of the completed incoming calls.

This power, of course, has never been used arbitrarily. Argument, persuasion and adjustment are tried in the first instance and the utmost patience is exercised, and only when it is obvious that all these have failed is the subscriber reminded of the terms of his agreement. If even this fails to produce the desired effect, then notice to determine the existing agreement may be necessary.

While the power to terminate the agreement has without doubt enabled us to relieve overloaded installations, it is of interest to note that in London during the past year, in no instance has it been necessary to resort to actual disconnexion of a subscriber's line to produce the desired result.

Lines to theatres and railway stations and goods yards are a prolific source of busy-tones and are most difficult to deal with. When a play is booming telephone booking is said to be a nuisance and is not wanted, so insufficient lines are provided to carry the traffic and busy-tones pile up. Often by the time the case has been worked up the play has ceased or moved on and the engaged calls have slumped. When a play is having a thin time and telephone booking would be welcomed, the small number of circuits provided is sometimes more than sufficient for the enquiries. We have considered various suggestions to cope with the difficulty, from having a central telephone booking establishment for all theatres where the heavy and light bookings would balance each other, and where a smaller number of lines than that rented at present would carry all the traffic, to putting an entry in the Directory to the effect that seats are not booked by telephone. The trouble has been reduced in certain cases but is still with us in others. I have hopes that a fair and reasonable solution will be found some day which will be to the advantage of the theatres, the public, and ourselves. America, I believe, is still seeking an answer to the same problem. Certain railway companies do not favour telephone enquiries apparently and leave to the Department the unprofitable task of turning away their customers for them. To show the remarkable pressure our telephonists have to deal with in this way on one railway installation during *one hour* on each of the six days prior to Christmas, no fewer than 2,157 busy-tone calls were recorded, and in one hour on one of these days the uncompleted calls reached the astonishing figure of 841. Does the railway company mind? Not a bit, for is it not safely sheltered behind the skirts (pre-War ones to be effective) of the London Telephone Service? Here again, a solution will be found, but it is a slow business and one likely to keep us busy for a long time to come.

It may be recalled that there are three types of busy-tone records taken by the Traffic Branch and passed forward to the Contract Branch for the subscriber to be approached :—

(1) A preliminary record.

(2) A one-day filter record.

(3) A six consecutive working day filter record to conform with the clause on the subscriber's agreement.

With regard to the preliminary records, a very large number of these are taken and, as would be expected, many fall on barren ground and produce no fruit. The most suitable dates for them and the exchanges where they should be taken are arranged between the Contract and Traffic Branches in order to prevent congestion and to assure that records are not taken in exchanges where there are exceptional plant difficulties, or at times when conditions are abnormal. The periods round Christmas, Easter, Whitsuntide, and the summer holiday season are generally avoided for obvious reasons. Where this preliminary record shows results suggesting that the number of incoming calls failing through the subscriber's line or lines being engaged exceeds 25% of those completed, a 6-day record is at once put in hand.

The one-day record is taken at the request of the Contract Branch or the subscriber who may require fuller particulars of the conditions existing on his circuit.

The number of six-day records is not large when compared with the other two, and this is well as the labour involved in taking it is considerable.

In London 5,959 records of all classes were passed forward to the Contract Branch in 1927 and 687 orders for additional lines and 212 extensions were obtained as a result of our labours.

A simple extension or change of number to enable auxiliary working to be arranged on existing lines is often sufficient to reduce the engaged line trouble to normal proportions.

The percentages of ineffective incoming calls for the past eight years were :—

1920	1921	1922	1923	1924	1925	1926	1927
17.0	14.5	13.0	13.3	13.0	12.0	11.8	11.1

The figure was as high as 18.6% during the first half of 1912 and we have just touched the lowest figure yet attained, viz., 10.9, in the last half of the year just finished. The abolition of the flat rate charge for telephone service, of course, had a share in this result. The reduction in the percentage varies, as is to be expected, and a little set-back at times serves the useful purpose of inciting us to further efforts.

It is estimated that a reduction of 1% results in a saving in operating costs of no less than £3,500 each year, and while the work involved in taking the records and obtaining the orders is heavy, it will be obvious that our labours are well worth while. We have dreams in our sanguine moments of a percentage in the neighbourhood of six or seven, but we have a long row to hoe before we reach that figure. The progress that is being made is encouraging, however, and subscribers no doubt appreciate the improvement in the service although their memories are proverbially short. W. F. T.

"HOLBORN CALLING."

THE popularity of Miss McMillan's musical burlesque was evidenced by the demand for a third performance which duly took place on April 10. Continuous ripples of laughter showed how every point went home to an audience in which we imagine telephonists predominated, and continuous applause marked the hearers' appreciation of the singers' and actors' efforts. The play was reviewed at some length in our last issue, and it only need here be said that Miss McMillan's verse was, as we have learned to expect of her, extremely finished and skilful, and her dialogue witty and full of happy allusions. We feel sure that larger audiences still and further repetitions would be required if everyone in the Service knew of the excellent quality of these performances. The fine singing of Miss Street, Miss Latimer, Mr. Hemsley, Mr. Whiffen, and Mr. Beale calls for special commendation, as does that of an attractive and well trained chorus. Mr. Hemsley and Mr. Beale, excellent comedians as they are, never suffered the humorous passages to flag, while the facial play of Miss Price was something to be remembered. Miss Lilian Jones filled a protean part, excelling both in comedy and dancing. W. H. G.

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INTERNATIONAL TELEPHONE SERVICES.

BY H. W. CAMP (*Continental Traffic Superintendent, London Trunk Exchange*).

FROM the day when Bell spoke from one room to another in the same house, the range of speech has continuously extended so that to-day there is theoretically no limit.

The development of the science of telephony is well known to all of us. First of all, came the local exchange where subscribers talked to each other within a very limited area, to be quickly followed by short-distance speech confined to the same town. It was not long before widely separated towns were linked up, and side by side with this extension international telephony was developed, first of all to centres near the frontiers and then between the capitals of countries. It is my purpose in this paper to tell you something of this special development of telephone science and of its problems, as they affect the traffic side.

The mainland of Europe is our nearest neighbour and it is only natural that the traffic demand should be to European countries. Indeed, until 1927 the public had nothing other than the continental services to use, as no extra European international system existed until the opening of the Transatlantic Wireless telephone service in January, 1927.

Historical Survey.—The first Anglo-Continental circuits were opened in the year 1891 between London and Paris by means of a submarine cable providing two speech channels connected to overhead lines from London to St. Margarets Bay and from Sangatte to Paris.

Six years later (in 1897) two more submarine cables were laid which provided two additional speech channels to Paris and one to Lille. Two telegraph circuits were also provided by these cables.

The Anglo-French service was extended to the provinces and by 1904, Birmingham, Bristol, Cardiff, and towns in Lancashire and Yorkshire were admitted to the service, while on the French side, the towns of Boulogne, Calais, Le Havre, Rouen, Orleans, Nantes, Marseilles, Lyons, and Bordeaux were brought within the orbit of the Anglo-French service.

A further cable was laid in 1910 and another in 1912 providing four more circuits to Paris.

On the outbreak of war in 1914 we had 9 circuits to France of which 8 were to Paris and one to Lille. Our military commitments in France made imperative an increase in the number of circuits between London and Paris, and during the 1914-18 period 15 additional cross-channel circuits were brought into use.

In 1921 there were 12 Anglo-French circuits in use for public service, and as a result of the surrender of circuits by the military and naval authorities, the suppression of circuits not justified on traffic grounds and the provision of phantom circuits, the number was increased in 1926 to 23 of which 18 were to Paris and one each to Lille, Calais and Boulogne. A new cable has recently been laid providing 14 physical circuits and 7 phantoms. The utilisation of these circuits will greatly improve the Anglo-French service and provide spares for extensions beyond France to Italy and Spain.

In 1913 a service between London and Switzerland was opened and calls were switched at Paris. This condition of affairs continued until the inauguration of a direct service to Switzerland in 1927. Three London-Paris circuits have been linked up with three Franco-Swiss underground circuits and London has now direct communication with Basle, Zurich and Geneva.

The first Anglo-Belgian circuits (2) were opened between London and Brussels in the summer of 1903 and the service was extended to the provinces in the following October.

In 1911 a further cable was laid providing 3 speech channels, and in 1914 there were 5 circuits between this country and Belgium. In 1923, three additional circuits were provided and we then had 4 circuits to Brussels, 3 to Antwerp, and one to Ostend.

In 1926 a modern submarine cable was laid from Dumpton Gap, on the Kent Coast, to La Panne in Belgium. This cable provides 14 physical circuits and 7 phantom circuits. All the existing Belgian circuits were transferred to this cable and additional circuits provided so that at the present time we have six circuits to Brussels and 4 to Antwerp. This cable has spare circuits for outlets to Central Europe via the La Panne-Herbesthal underground cable which traverses Belgium and joins up with the German underground system.

The above survey completes the story of the pre-war international services from the point of view of the provision of circuits. It must, however, be admitted that progress for the first 30 years was slow, and although large areas were open to these services, communication was practically limited to London, Paris, the North of France, Brussels, and Antwerp. During the war the Engineers were continually experimenting in order to extend the range of speech, and the invention of the valve amplifier, commonly known as the Repeater, has to a very great extent solved the problem of long-distance telephony. It is mainly owing to this invention that the remarkable progress of recent years has been possible.

I will now continue the historical survey of the post-war services.

In 1922 the first Anglo-Dutch cable was laid and on Aug. 15, one circuit to Amsterdam and one to Rotterdam were opened for service. These circuits were heavily overloaded from the outset and in 1924 a second cable was laid providing 8 physical and 4 phantom circuits. This was the longest submarine cable of this particular design up to date. Additional circuits were opened giving London 5 circuits to Amsterdam, 4 to Rotterdam, and one to the Hague. After the laying of the third submarine cable an additional circuit to Amsterdam and Rotterdam was provided so that we now have 6 to Amsterdam, 5 to Rotterdam, and one to the Hague.

In March, 1926, it was found possible to open a partial service to Berlin, Hamburg, Cologne, Bremen, and Frankfurt by the extension of some of the Dutch circuits, and on April 19 communication was provided to these places from 5 p.m. to 8 a.m. daily and over the week-ends.

During the summer a third Anglo-Dutch cable was laid to provide 12 circuits to Germany, and on July 1 continuous service with Berlin was opened with one circuit. On Sept. 7 a direct circuit was opened to Hamburg. After exhaustive engineering tests the full service was opened on Jan. 3, 1927, the distribution of the circuits being 4 to Berlin, 4 to Hamburg, and one each to Frankfurt Main, Bremen, Cologne and Düsseldorf. During the year a service to Danzig was opened with Berlin as the switching centre.

Three submarine cables provide 27 speech channels of which 25 are utilised and all are underground throughout the land line length with the exception of the Stockholm circuit which has a short overhead length.

In June, 1927, the Anglo-Swedish service was inaugurated by the provision of a direct service between London-Stockholm to be shortly followed by the extension of the service to Gothenburg. In view of the unsuitability of the circuits between Stockholm and Gothenburg, it was decided to give a half-hourly service to each locality, the switching over from one town to another to be carried out at Malmö.

The service has recently been extended to cover the whole of Sweden and the whole of the provinces in Great Britain. The London-Stockholm circuit is the longest international circuit between Great Britain and the Continent. Its overall length is 1,547 miles, while its electrical length is only 10 miles. It has 23 Repeaters and 2 echo suppressors, two lengths of submarine cable, one across the North Sea from Aldborough to Domburg and the other across the Baltic from Stralsund on the German coast to Malmö in Sweden. It is underground from London to the coast and from the Dutch coast to Stralsund and overhead from Malmö to Norr Köping about 500 miles from Stockholm, where it again goes underground to its termination.

In July, 1927, a service to Denmark was opened limited to London and Copenhagen. Calls were at first switched at Hamburg, but a through circuit between London and Copenhagen has recently been provided and the service extended to the British provinces.

On Oct. 1 a service to Norway again limited to London and Oslo was opened and in this case also no direct circuit has been provided. Calls are connected via Gothenburg during the half-hour period that the Anglo-Swedish circuit is terminated at that point.

It will, no doubt, have been realised that the progress made since 1921 has been far in advance of anything that was accomplished in the previous 30 years, and as I pointed out earlier, the main factor in the extension of the speech range has been the employment of the valve amplifier. The main factor in the increase in the number of circuits between Great Britain and the Continent has been the improvement in the design of submarine cables. You will have noticed that prior to the war, cables were laid which provided 2 physical circuits and one phantom circuit, but as a result of engineering experiments, cables of a far greater capacity were designed and brought into use. These modern cables provide from 12 to 21 or more speech channels.

All the new international circuits have an electrical length of 10 miles and all are underground for the greater part of their length.

Fees and Method of Charging.—The day-rate charges for calls are based on a zone system and vary according to the distance from the country of origin. In Great Britain there are three zones, the first of which is south of a line drawn from the Humber to the Bristol Channel but excluding the counties of Devon and Cornwall; the second zone comprises the remaining counties of England and the whole of Wales; while the third takes in Scotland and Northern Ireland.

In France there are also three zones dividing the country from east to west. Paris is in the first zone.

In Germany there are 12 zones, the first is nearest the Dutch frontier, while the twelfth comprises a small area on the eastern extremity of East Prussia, Cologne is in the second zone, Frankfurt in the third, Hamburg in the fourth, Berlin in the fifth zone, Dresden in the sixth, Liegnitz in the seventh, Breslau in the eighth. Sweden is divided into four zones, Malmo being in the first and Stockholm and Gothenburg in the second. Belgium, Holland, and Switzerland each comprise one zone.

The day-rate fees to the Continent vary from 6*s.* to 24*s.* for a three-minute day call, and the night rate is always, approximately, three-fifths of the day rate. The rate for calls on a contract basis during the night hours is half the day rate. The fees in the terminal countries vary according to the zone system, but the transit rate, i.e. the rate for the country through which a circuit runs but does not end, is a fixed amount. There are only two charging periods, Day and Night, the day rate commencing at 8 a.m. and ending in some cases at 7 p.m. or 7.30 p.m. and in others at 9 p.m.

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The method of charging is minute by minute after the first three minutes, and the minute charge is one-third of the unit charge. Calls commencing at day rate and running over into the night rate are charged as day rate calls, while those commencing at the night rate and carrying over to the day period are charged at the night rate.

The calls on a contract basis mentioned above are known as subscription or abonnement calls. The minimum duration is either three or six minutes nightly for one month. The agreement is automatically renewed month by month until terminated by the subscriber.

The Traffic Aspect of our International Services.—Method of Operating: The operating procedure on all circuits is that known as the preparation in advance. By this method one number is demanded for immediate connexion with another number to follow so that the called and calling subscribers are rung before the call actually connected is finished. One weakness of the operating procedure is that when calls reach the distant exchange they are subject to the treatment accorded inland calls of the country of destination. For example, the interruption procedure is not in force in France and Belgium, and is therefore not applied to calls originating in other countries, whereas the interruption is common to the Dutch, German, and Sewdish systems. The challenge at the termination of the 3-minute periods is not in force in any Continental country, except Czecho-Slovakia.

Other points of procedure are (1) No reply calls are treated as cancelled, and the originating exchange must renew the demand; (2) A call refused by the calling or called subscriber is charged for at the normal unit rate if the called subscriber is waiting. Now that the minute by minute charging is in force telephonists no longer ask subscribers if they require another 3 minutes. They say instead "Do you wish to continue?" At the termination of each call the controlling telephonist advises the distant telephonist of the number of minutes charged.

Pink tickets are prepared for all incoming calls and timed on and off as for an outgoing call.

Two tickets are prepared for calls originating in the provinces, one white out-district and a blue-zone ticket. The white ticket shows the duration and is used for revenue purposes, while the blue ticket shows the duration and all relative notes. Tnis ticket is retained in London so that in the event of any enquiry it is not necessary to ask the provincial District Manager to return the white ticket to London.

Provincial calls to and from the Continent are normally connected via the London Repeater Position. The Continental Home position telephonist prepares the connexion by getting into touch with the calling and called subscriber. The connexion is then handed over to the Repeater position telephonist, who picks up the Trunk circuits specified, brings in the Repeater and controls in the usual manner.

The Foreign Division of the London Trunk Exchange known as the CX Division comprises 32 positions of which 30 are operating and 2 are observation positions. These positions are accommodated on the 3rd and 1st floors of the G.P.O. South building. On the 3rd floor (Main Trunk Exchange) are the French, Belgian, Swiss, American, Repeater and Observation positions, and on the 1st floor (Trunk Record Room) are the German, Dutch and Swedish positions.

There are 57 international circuits accommodated on 29 positions, and in addition, one of the Repeater positions is staffed by a Foreign Section telephonist.

The staff directly associated with the service comprises 6 Assistant Supervisors, Class II, of whom 4 are French and 2 German speakers. There are 31 French and 7 German speaking telephonists. Three telephonists without language qualifications are employed on the American service. Two telephonists are employed for the Enquiry duty and 3 are utilised for clerical work, ticket pricing, preparation of the international accounts and other returns.

The Anglo-French Service.—We have 4 French routes, London-Paris with 18 circuits and one circuit each to Lille, Calais and Boulogne, accommodated on 8 positions.

As may be imagined, the Anglo-French service is the largest of our international services, both on account of the number of circuits and the volume of traffic.

The day hours of service are from 8 a.m. to 7.30 p.m., and night hours from 7.30 p.m. to 8 a.m. The fee is 6*s.* for 3 minutes during the day period, and 3*s.* 7*d.* during the night period.

We have direct communication with the Paris Bourse from noon until 3.30 p.m. daily, and 4 circuits are allocated for general Bourse traffic. Satisfactory communication can be given to all the important centres in France and to most of the exchanges in the first and second zones. The business day commences about 9.45 a.m. and continues until about 6 p.m.

The traffic to and from the Lille area is fairly heavy, particularly during the wool sales and when the cotton market is active. At such periods there is considerable community of interest between Liverpool and Bradford and Roubaix. Lille is the switching centre for all places in the North of France.

The Calais and Boulogne circuits serve limited areas and cannot be used as switching centres, as no suitable Repeater equipment is available in these exchanges. These circuits are very lightly loaded, particularly during the winter period.

Now that the underground route between Paris and Boulogne has been completed, and the new submarine cable is ready, resulting in a much improved service from the standpoints of transmission and stability of circuits.

Detailed statistics of Anglo-French traffic are not available prior to 1921, but yearly figures of total effected traffic are available from 1904.

These figures show that in 1904, 69,000 unit calls were effected, by 1909 the figure had risen to 78,000, and in 1914 to 150,000. Development ceased during the war years, but in 1922 the figure was 362,000, and in 1926, 526,000. It should be realised that in 1904 there was 4 Anglo-French circuits, and in 1926 there were 21.

The above figures, however, only show the number of calls effected and are directly related to the number of circuits working. The incoming effected traffic is slightly higher than the outgoing. The outgoing day and night demand is, I think, of greater interest, as it shows the real growth of the public demand.

In 1921 the average monthly bookings were 7,000, in 1922, 8,600; in 1923 the figure increased to 9,600; and in 1924, to 10,000. The increase in 1925 was only about 200 calls per month, but the 1926 figure shows a monthly average of 11,000 demands. The 1927 figure is somewhat lower as the new night rate period commenced at 7.30 p.m. instead of at 9 p.m., as in 1926, but even with this shortening of the day rate period, the demand still fluctuates between 10 and 11,000 per month. The night demand curve follows that of the day, although the volume is naturally not as great. The night demand rose from about 1,000 per month in 1921 to 1,200 in 1922. During the following years up to 1927 the demand remained stationary around 1500. The drop in day demand just mentioned was compensated for by a corresponding rise in the night demand, the figure for 1927 being around 2,400 bookings monthly.

Anglo-Belgian Service.—At the present time there are 10 circuits to Belgium, 6 of which are to Brussels, 4 to Antwerp. Until the summer of last year the service to Antwerp could not be called satisfactory owing to the very poor transmission value of the circuits. When the new cable was ready for use the whole of the Belgian circuits were transferred thereto, and we are now able to give a satisfactory service to any part of Belgium. A very successful demonstration call from Dundee to Ghent was recently effected, the speech volume of which was excellent. It is doubtful if such a connexion could have been effected with the old circuits.

The delay to Belgium does not normally exceed 30 minutes between 10 a.m. and noon. The day fee, 8 a.m.-7 p.m. is 7*s.* 3*d.* The curve of Anglo-Belgian traffic shows how various services can react one on the other, and there has been a definite fall in traffic since 1923. The explanation is as follows. Most of the international day traffic is in connexion with finance, and while communication was limited to the Paris, Brussels and Antwerp markets, the public were content to talk to Brussels and Antwerp. These towns, however, are not of themselves important financial centres, and when communication became available to the Amsterdam market the traffic was diverted to that centre. Hence, we lost a great proportion of the financial traffic and we have not made the loss good by a corresponding increase in ordinary commercial traffic.

Another factor is the entire elimination of outgoing night newspaper traffic to Brussels. These calls were re-transmitted from Brussels to Holland and Germany, but with the opening of the latter services, the calls were transferred to the Amsterdam and Berlin routes.

Before the circuits were put underground and transferred to the new cable, 13% of the calls were ineffective, but the percentage at the present time is only 7. Until May, 1927, there was no reduced fee at night, and the rate was 8*s.* for 3 minutes. A night rate fee (7 p.m.-8 a.m.) 4*s.* 4*d.* for 3 minutes is now in force, but the night traffic remains very light.

Anglo-Swiss Service.—The service was opened in 1913 on a switched basis via Paris. During the European currency crisis the bookings became very heavy, and there was intense competition among users for connexion with any Swiss town.

We now have 3 direct circuits, one to Basle, one to Geneva, and one to Zurich. The service is available to the whole of Switzerland.

The day 8 a.m.-9 p.m. fee from London 8*s.* for 3 minutes.

The Swiss traffic is almost 100% financial. There is no ordinary commercial traffic and very little social traffic. Despite the fact that Switzerland is a great tourist centre, both in summer and winter, the night traffic to Switzerland did not average more than a dozen calls monthly between 1921 and 1926. The 1927 figures show some improvement, the demand being about 40 calls monthly.

Anglo-Dutch Service.—The first new post-war service was that to Holland. We opened in 1922 with 3 circuits, and at the present time we have 12—6 to Amsterdam, 4 to Rotterdam and 1 to The Hague. The circuits are underground throughout the landline lengths, and are of high transmission efficiency. The whole of the British Isles and the whole of Holland are open to the service. The day fee from London is 8*s.* for 3 minutes between 8 a.m. and 7 p.m. The day demand has steadily increased since the opening of the service. The year 1922 showed a monthly demand of 3,000 bookings, 1923 was just below 5,000 and 1924 just above. In 1925 the demand was around 5,400. In 1926 the coal strike gave an added impetus to the demand and the monthly figure rose to 6,200. The 1927 monthly demand is approximately 6,000.

The night demand increased satisfactorily up to the opening of the German service. Our night newspaper traffic grew from 120 calls monthly in 1923, to 250 in 1925, but as these calls were re-transmitted to Germany, the opening

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of the direct service to that country caused the diversion of nearly the whole of this traffic, and the figure since March 1927, has been in the region of approximately 50 calls per month.

The total night demand (ordinary and newspaper) during 1926 was about 625 bookings per month, but despite the fall mentioned above, the 1927 monthly figure is around 500 calls.

Anglo-German Service.—An important extension of the international services took place when communication was established with Germany. Up to that time the service was limited to countries far less industrialised than our own, and apart from Holland, to countries less developed, from the telephone standpoint than Great Britain. In the case of Germany, it meant that we were in touch with a great industrial country, possessing up-to-date telephone equipment and with the largest underground system in Europe.

The full service was opened on Jan. 3, 1927, with direct circuits to Berlin, Hamburg, Frankfurt Main, Cologne, Düsseldorf, and Bremen. Continuous service had previously been inaugurated with one circuit to Berlin on July 1, and with one circuit to Hamburg in September. From the outset the demand was heavy and it has risen continually. Service is available from any part of Great Britain to any part of Germany, and the transmission on all circuits is excellent.

The charges for calls range from 9*s.* 3*d.* to 20*s.* 3*d.* for 3 minutes, the Berlin charge being 12*s.* and Hamburg 11*s.* 3*d.* The day rate hours are 8 a.m. to 7 p.m.

The outgoing day demand was 3,300 in January, and in October was 5,800, and except for a slight drop in July and August the increase has been continuous.

The busiest routes are Berlin, Hamburg and Frankfort, and traffic over the Cologne and Düsseldorf routes is increasing.

The night demand (7 p.m.-8 a.m.) has also increased, but not as rapidly as that for the day period. The January demand was 1,150, while that for October was 1,650.

Anglo-Swedish Service.—The latest direct service to open was the service between London and Stockholm in June of this year. Only one circuit is at present available. Communication is available to the whole of Gt. Britain. Satisfactory speech trials have been carried out between London and Lulea in the extreme north of Sweden. The traffic is increasing and it is anticipated than when service is available to the ports on the western coast of Sweden there will be a large increase in demand for communication.

Anglo-Danish and Anglo-Norwegian Service.—An Anglo-Danish service was opened via Hamburg in July, limited to London and Copenhagen. The provinces in Great Britain can now communicate with Copenhagen, and a "through" circuit between London and Copenhagen has recently been provided.

The day demand to Copenhagen was 140 bookings in August and 227 in October.

The London-Oslo service was opened on Oct. 1 via Gothenburg, in Sweden. The demand during October was 174 calls.

Maintenance of International Circuits.—The percentage of lost time depends to a great extent on whether the lines are overhead or underground. In the former case they are affected by bad weather. The underground circuits are far more complex and, although seldom affected by the weather, they require continuous attention at repeater stations.

Latest Development.—Services to Vienna via Frankfurt were opened on Dec. 1, 1927, and to Prague and Budapest on Jan. 1, and subsequently extended to the whole of Austria and Hungary. Services to Poland and Spain are under consideration.

There is a certain community of interest between shipping people here and on the Continent, and outside London, Liverpool is the largest provincial user of the service. The textile industries (wool and cotton) use the service particularly to Roubaix, and we have recently had a demand from the woollen industries around Bradford for communication with Lodz, in Poland, which is a centre for this trade.

Our endeavour must be to awaken interest in overseas telephone communication and give a type of service which business people will prefer to use rather than any other means of communication. It is true we have been handicapped in the past, owing to insufficient transmission and delay, and other factors, but this condition of affairs does not exist to-day. In this connexion a great deal is being done by the canvassing campaign now in force throughout the country, and by the provision of the booklet containing details of the service. Now a would-be user of the service can see at a glance what are the conditions and the fees for calls.

The International Committee.—The growth of international telephony in Europe has necessitated the formation of a body of officials to co-ordinate as far as possible the regulations governing international telephone services. Practically all the European administrations send delegates and the Committee itself is subdivided into various sub-committees to study technical, traffic and other problems. Mr. Trayfoot, of the Secretary's Office, Traffic Section, is a member of the Traffic Sub-Committee. The Committee has recently issued a code of rules for international traffic covering the main points of general procedure. The administrations are expected to carry out the regulations, but there are many important matters left to their discretion. However, a great step forward has been made and in international affairs one must hasten slowly.

Notes on International Services in other Countries.—I have been able to obtain some interesting figures in connexion with the development of international traffic in Europe generally. The largest single group of international circuits is that between London and Paris, with 18 circuits. This is closely followed by the Paris-Brussels route, with 14 circuits.

France.—The first international route was opened in 1887, between Paris and Brussels. At the present time there are about 300 international circuits between France and other countries. There are 71 main-line circuits terminated in the Paris Trunk Exchange, and there is direct communication with Madrid, Vienna and Prague. No traffic figures are available, but some indication of the growth may be gathered from the revenue figures which were 1,400,000 fcs. in 1906 and 50 million fcs. in 1926.

Belgium.—Belgium possesses approximately 155 international circuits. Forty international circuits terminate in the Antwerp Trunk Exchange and 48 in Brussels, while the remainder are short circuits between points near the frontier. There are 9 Antwerp-Rotterdam and 7 Antwerp-Amsterdam circuits. Brussels has direct communication with Vienna.

The total number of effected units in 1906 was 395,000 and in 1926 2,900,000. The Anglo-Belgian total takes fifth place after France, Holland, Germany and Luxemburg.

Switzerland.—The first international routes were opened in 1892 to frontier points in Austria, France and Germany. In view of the geographical position of Switzerland, it is not astonishing that the international traffic has grown. Forty-three Swiss towns possess international circuits, there are 132 routes and 219 circuits. Sixty-two circuits terminate in Bâle, 40 in Zurich and 30 in Geneva.

In 1906 the traffic outgoing from Switzerland was 145,714 effected units, and 1,554,000 in 1926.

Holland.—The first international service was opened between Rotterdam and Antwerp in 1895. Holland possesses 146 international circuits, of which 92 are to Germany and 37 to Belgium. Switched services are provided to Denmark via Hamburg, Hungary and Austria via Frankfort, Italy via Bâle and Czecho-Slovakia via Berlin. The total effected traffic was 204,500 units in 1906 and 1,537,000 in 1926.

Germany.—There are about 200 main routes from the chief towns in Germany to the chief towns in Europe. Fifty-six international circuits are terminated in Berlin and, in addition to direct communication with towns in Western Europe, there are direct circuits to Warsaw, Stockholm, Copenhagen, Vienna and Budapest.

The first services opened from Berlin were to Vienna and Budapest.

It has not been possible to obtain any traffic figures for the whole of Germany, but the Berlin statistics for 1926 give a total of 814,000 effected calls. The figures for 1927 will probably be in the region of 1,200,000.

Anglo-American Service.—The Transatlantic Wireless Telephone Service was opened on Jan. 7, 1927. After many months of experimenting one of the finest feats of electrical engineering was accomplished, and the old world and the new were brought into touch as never before.

At the outset the service was limited to London and New York, but by Feb. 26 the whole of the U.S.A. had been admitted. The service extended to Cuba a few weeks later and to the five Canadian towns, Ottawa, Montreal, Quebec, Toronto and Hamilton, on Oct. 3. This service is unique from the technical point of view in that the radio circuit is voice-controlled, and unique from the traffic standpoint in that we have adopted the full person-to-person system in force in America.

Perhaps a few notes on the person-to-person service may be of interest. The main idea of the system is to put Mr. A in communication with Mr. B, and the telephone service undertakes to do so before a fee is raised on the call. This means, of course, that if the called party is not at the telephone designated he must be sought for. There is no limit to the search unless the operator is told that he is not expected or a similar report indicating that a search is useless. Moreover, the calling party may be absent when the call matures and he in his turn must be looked for, the call being meanwhile held up. The system is greatly appreciated by subscribers, but you will realise that its greatest weakness is the loss in circuit time.

In connexion with the Transatlantic service the charge varies from £9 to £11 8*s.* for 3 minutes. The U.S.A. are divided into five zones and there is a difference of 12*s.* for each zone. Calls to Havana (Cuba) are charged at the 5th zone rate—£11 8*s.*, while a 3-minute call to any other part of the island costs £12. A special fee, known as the "Report charge," of £1 is levied in cases where the called telephone having been reached, the person required cannot be found, either at his own telephone or elsewhere.

The timing arrangements include the calculagraph impression, a record of each 20-second period of conversation and the duration details of the observation telephonist.

The position officers are known as the Advances Calling Telephonist and the Control Telephonist.

The first named is responsible for the preparation of the call prior to setting up the connexion to the radio channel. This means getting into touch with the subscriber in this country and advising him of the reports on his call which have been made by the New York operator.

The control telephonist makes the connexion to the radio channel, times the call on and off, advises the calling party at the end of each 3 minutes of the lapse of time, and keeps the 20-second timing record mentioned above.

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An important point of procedure is that at the end of the 3-minute periods the control telephonist does not ask the caller if he wants another 3 minutes or even if he wishes to continue. She simply announces the passing of the 3-minute periods by saying 3 minutes, 6 minutes, &c., and the caller himself decides whether he will or will not continue. Conversations must be limited to 12 minutes if two or more calls are awaiting connexion.

New York has direct circuits to the following Canadian cities: Montreal, Toronto, Quebec, and there are about 370 circuits crossing the frontier throughout its 3,500 miles. Chicago has a direct circuit to Winnepeg and Seattle to Victoria and Vancouver in British Columbia. The service to Cuba was opened early in 1921 and the line passes through to Philadelphia, Baltimore, Miami to Key West and thence through a submarine cable to Havana.

Service has lately been opened between the United States and Mexico by a direct circuit from New York to Mexico City via Chicago, St. Louis, San Antonio, Monterey and San Luis Potosi.

Development in Wireless Telephony.—The Transatlantic service was extended to Canada in October last, and to the Continent of Europe in the early part of 1928—to Belgium and Holland in January, to Germany and Sweden in February, and to France in March. Further developments are in contemplation.

There is the possibility of utilising the Beam systems for telephone purposes and thereby giving telephonic communication with Canada, South Africa, and India. The Germans are experimenting with a service to Buenos Aires and the Dutch with a service to the Dutch East Indies.

I cannot bring this paper to an end without a word of congratulation to our Engineers who have done so much to improve and perfect our overseas telephone communications, and if the future of these services depends upon the co-operation of the engineering and traffic staff, then success is assured.

I also offer my best thanks to my colleagues in London, New York, and on the Continent who have so kindly furnished me with information for this paper, and also for their co-operation at all times in making our overseas telephone service run smoothly.

THE GLOOM ABOUT TELEGRAMS.

(FROM THE *Manchester Guardian*, MARCH 24.)

THE dismal report of the Committee on the Inland Telegraph Service has at least provided a useful target that can be shot at from all sides. The Post Office worker not unnaturally resents the suggestion that a growing "inertia" on his part is one factor in the decline of the service, and will not easily lie down under the suggestion that his abilities as an operator decline after the age of thirty-five. The layman will view with some suspicion the constant suggestion that crops up in the report that under "Civil Service methods" reform is impossible, and that if the methods of big business could be applied to the service all would be well. That argument, produced at regular intervals in the half-century since the State was compelled by popular demand to take the telegraph service out of private hands, is very properly discounted as representing an attitude of mind to which all forms of nationalisation are abhorrent. It is strange to hear it seriously put forward to-day, the more so when it is remembered that in the United States, one of the few remaining countries where the telegraph is still privately owned, its cost to the public is greater than here, and its efficiency no higher. The plain fact is that the Committee had a singularly unhopeful task to perform. They had to consider what steps can be taken to reduce the deficit on a service that never has paid and that is now declining in public utility. Were a deficit on telegraphs a new feature in our national accountancy they might have approached their work with some hope of discovering causes and remedies for a temporary malady. But none who surveys the history of the service can be buoyed up with expectations of making a financial success of a Department that has never shown a profit—and least of all at a stage in its history when it is faced with more severe competition than at any time before.

A loss on telegraphs is not, of course, a peculiarly British complaint. The Governments of France, of Belgium, and of Switzerland, for instance, have, like our own, put the need of efficient national communication before even the certainty of profit. And viewed by that test the State telegraph has in its day served Britain well. When the Government took it over at the price—strongly criticised for long afterwards as excessive—of some £8,000,000, and spent nearly another £2,000,000 on extending it, some 6½ million telegrams were sent per year. After five years of State management that number had risen to 20 millions. Ten years later, after a stiff fight, the advocates of still further easing communication gained their way in the Commons and the sixpenny telegram took the place in the national life that it held for 30 years. Under this stimulus the telegrams sent rose quickly to over 50 millions a year, and just before the war had nearly touched 90 millions. It is noteworthy that the deficit on the service then was considerably less than it is to-day, when the cost of a twelve-word telegram is a shilling. As a record of public utility that is something to set off even against a persistently adverse balance-sheet. But there can be no doubt that that utility is declining, nor that the chief cause, more cogent than the "inertia" of telegraphists or even the unbusiness-like methods of the Civil Service, is the popularity of the telephone. The report gets to the root of the matter when it admits that "the competition of the telephone service tends to kill the short-distance telegraph traffic." In the last five years the number of trunk telephone calls has nearly doubled, and stands now in the region of 100 millions. There is nothing here for tears, for clearly what the State is losing on the swings it is making on the roundabouts. By all means let us do what can be done to enable the inland telegram to play its remaining part more efficiently, but it is surely needless to propound theories about the inherent viciousness of State management or the growing lethargy of civil servants when the root cause of the telegraph's decline is patent.

Some of the reforms which the Committee suggest seem on the face of them reasonable if trifling. If it is indeed the case that the service is so constituted that its lack of opportunities for promotion deter the young man of ability from entering it there is room here for departmental reform. Again, many who have observed the telegraph boy in the course of his official "walk" of delivery will no doubt agree that "careful and detailed inquiry" into the "walk" system would be justified if it slightly accelerated him. There will even be found supporters for the revolutionary proposal that after all these years we may at last be absolved of the necessity of licking our own stamps when dispatching a message. But the other bids for popular favour are not so happy. The notion that a waning affection for the telegram will be revived by the fact of having to pay 1*s.* 1*d.* for the mere privilege, as it were, of entering the post office and before inditing a word seems an odd one. Still more curious is the hope that a nation accustomed to think in such simple and straightforward terms as "twelve words for a shilling" will be reconciled to a higher tariff by the knowledge that a 3*d.* rebate on 1*s.* 1*d.* is available at 2.1 p.m. which is not available at 1.55. Again, the Committee appear to think it possible that since under the proposed new rate a telegram of 26 words, or over would actually be cheaper than at present we may be tempted to a needless exuberance on the wire in order to make sure that we get value for our money. But that, surely, is a mentality seldom met with outside the jokes that pertain peculiarly to the city of Aberdeen. Frankly, one does not see in this report much renewed hope for the telegraph service. Nor, since the telegraph as we have known it may any time, in the extraordinary fertility of electrical invention in which we live, be displaced by some such device, for instance, as the transmission of the actual image of a written message, does the failure of this Committee to improve on the ideas of its numerous predecessors seem very greatly to matter.

EAST TO WEST.

BY J. H. RAMSAY (*Glasgow*).

CONGRATULATIONS to the two German airmen and their Irish companion who succeeded in the remarkable, but decidedly lucky feat, of flying the Atlantic from East to West. Following this partial success, we may be sure that several attempts will be made this summer, but certainly with disastrous results.

The "Bremen" type of machine is undoubtedly one of the best, and the pilots navigating it were of exceptional experience, yet, having taken the air with petrol to last forty-two hours, they were forced to land, after flying for thirty-eight hours, with one-third of the intended distance still to be flown, and 400 miles north of their intended landfall!!!

Knowing something of the vagaries and inclement conditions existing in the North Atlantic, I am convinced that our present heavier-than-air machines are not suitable for Atlantic flights; moreover, Aerial navigation is distinctly primitive, and pilots flying over wide expanses of water have to trust even more to luck than their compass. In attempting to cross the Atlantic, when well clear of land, and out of touch with shipping, the airman has no means of checking his "drift" or exact position, and being unable to do so, we find that the compass error is bound to be great, and the nearer the approach to the coast of Labrador, the greater the error becomes, as you near the North Magnetic Pole, which is situated in latitude 70° N., longitude 97° W.

Variation (the angle between the True and Magnetic meridians) changes very quickly, and Magnetic storms are prevalent which magnify errors and render the compass useless. The vibration and highly magnetic type of engine of an aircraft, are also contributory causes of compass-error.

Meteorological reports cannot be expected to be fully reliable when they embrace the whole of the North Atlantic. Machines may leave the west coast of Ireland, in what are considered to be "favourable flying conditions" and reports from Nova Scotia may also be favourable, but what are the actual conditions, say 900 miles W.N.W. of Ireland?

The safest Atlantic route is at present, unquestionably, via the Azores, and the best type of machine would be a multi-engined flying-boat, capable of keeping the air for seventy hours—other efforts will be suicidal.

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TELEGRAPHIC MEMORABILIA.

ALGERIA.—*The Times* reports that communication between Paris and Algiers by means of short-wave beam wireless telephony was opened on March 19, when M. Bokanowski, the French Minister of Commerce, spoke to M. Bordes, the Governor of Algeria. M. Bordes could not reply, as communication is at present unidirectional.

AUSTRALIA.—An emphatic declaration that the Postal Department intends to insist upon the improvement and co-ordination of Australian broadcasting services, says the *Electrical Review*, was made recently by the Postmaster-General (Mr. Gibson), who said that existing licences would expire in about 17 months, but it was not the intention of the Department to wait so long for improvements in services. He was not concerned with the private affairs and financial relations of the companies. According to the *Sydney Morning Herald*, adds the same authority, the amalgamation of four or two companies, or of four in groups of two, would not satisfy him. His view was that there should be close contact between broadcasting companies in all States. It should be possible without difficulty to arrange for the control of all stations by the one authority, whether or not each station kept its finances separately. If the one authority could be obtained it could make financial provision to cover the working of the stations in the smaller States. Merely because of a difference in population, stations in the eastern States were enabled to make good profits, while those elsewhere were in difficulties. It would not be possible to introduce differential licence fees to control the earnings of companies, and it was proper to expect that large earnings in one State should balance necessarily smaller earnings in the others. While efforts to co-ordinate services were proceeding, it was unlikely that additional licences would be issued in cities in which stations were absorbed. It had been found necessary to refuse several applications by existing "A"-class stations for the right to broadcast in Tasmania and Western Australia. Some of the stations had offered to undertake the work without any operating fee, but it had been felt that injustice would be done to stations in those States and South Australia if the applications were granted. Mr. Gibson added that the resolutions of the Washington Conference had been received, and the re-allocation of wavelengths to Australian stations would be undertaken shortly.

The following is the satisfactory sequel, apparently: "The directors of the two Sydney stations reviewed the New South Wales position after the Premier's hint, and negotiations between 2FC, Ltd., and Broadcasters (Sydney), Ltd., (2BL), which have since been proceeding with the object of taking the first step towards meeting the Government's wishes."

According to the *Board of Trade Journal*, the amendments in a Commonwealth Legislature Act recently passed include the fixing of the following new rates of the Australian tariff viz.: British preferential 35% *ad valorem*, intermediate 50%, and general 55%, in duties on "wireless sets and headphones.

BELGIUM.—The British Department of Overseas Trade in its report on the economic situation in Belgium in 1927 by the British Commercial Secretary in Brussels makes the following interesting remarks on matters specially relevant to these columns. "It is considered," says the report, "that the slow development in the Radio industry in Belgium is due to the inadequate broadcasting service in Brussels and Antwerp. One concern holds all the Marconi licences, which it re-issues to local manufacturers on a six-months' contract basis. Importers are placed on the same basis as manufacturers. There are many important Belgian firms with a large output, and a number of small firms turn out a few sets per month. The period of cheap wireless supplies has now passed, and retailers can command almost their own price, subject to competition. Owing to the development of flat-residence, receiving sets with frame aerials are in good demand, as are also portable sets. The majority of the better-known French sets are on the market at competitive prices. American and British sets are sold regularly, but as a rule the sets of British origin (with the exception of portable sets, which are selling well) are still about 50% higher than the competing products, and are often not suitable for local conditions, for anything less than a four-valve set cannot take the stations on which Belgian listeners greatly rely. Loudspeakers, however, and certain component parts of British origin have very successful sales."

On the telegraph side, it is stated that the placing of telegraph lines underground proceeded throughout the whole of 1927, which is very good news for international telegraphy. The report goes on to speak of the inauguration of its long-distance international "Belradio" station last October and which, it may be added, now appears to be working satisfactorily to the Congo, Dutch East Indies, Japan, Australia, North America and the Philippines.

At the receiving station, Liedekerke, a low-power, short-wave transmitting set is in course of construction and assembly.

CANADA.—In 1927 a net profit of 463,967 dollars (£80,793) was made by the telegraph service operated by the Canadian National Railways. In 1920 there was a loss of £20,498. Rates vary according to distance and time of dispatch. The High Commissioner for Canada in London announces that this same company is now installing, at a cost of $2,500,000, a modern high-speed telegraph system between Vancouver and Montreal, which is expected to be in operation within three months. Mr. R. W. Ball, general manager of the western region, states that the carrier current system which is being used, which is the application of audio-frequency to telegraph service, will make it possible to transmit 84 messages simultaneously, using the human voice in both directions. The new system uses two wires, whereas the old system used one wire over which eight messages could be sent simultaneously; the new service will therefore result in speeding up communication tenfold. Installation of the new equipment between Montreal and Winnipeg has already been completed.

Canada's claim to more exclusive wavelengths is likely to be postponed in the event of the United States Federal Radio Commission's not receiving a further lease of life. Legally the Commission's authority expired on March 15, and Congress appears disinclined to grant a renewal of that authority, says *World Radio*. The Commission expects to get a special mandate from Mr. Herbert Hoover, Secretary of Commerce, to carry on its work until the transfer of its activities is made to the Department of Commerce. The most important Canadian claim now pending is that for an additional exclusive band for the use of the Manitoba Provincial Government's station; the Canadian authorities reminded the United States that Canada's claim stands for at least a dozen exclusive bands instead of the present six, and an increase in the number of shared wavelengths was also suggested.

The London *Daily Telegraph* states that direction-finding stations are to be constructed in the Hudson Straits to aid vessels proceeding to Fort Churchill following the completion of the Hudson Bay railway to that port. Two of these stations will be erected this summer and two more in the summer of 1929.

The four stations will be ready, adds the *Electrical Review*, for whatever traffic results from the completion of the Hudson's Bay railway terminal at Fort Churchill in 1930.

It is understood by *World Radio* that the estimates brought forward in the House of Commons at Ottawa include a grant of £38,000, which is to be allocated for the purpose of providing funds to go towards the improvement of broadcast reception conditions in Canada for listeners.

Canada's new high-power station (CKGW), which was officially opened on March 5, operates on a wavelength of 312.3 metres, and has been temporarily listed under the experimental classification with the call 9GW, says *World Radio*. Condenser microphones are used, such as have hitherto been employed exclusively by the (WGY) Schenectady station, but the National Broadcasting Co. is also to install similar instruments at the WEAF station. Two telephone lines, one for control, each 47 miles in length, connect the studios at Toronto with the transmitter at Bowmanville, where the aerial is supported by two steel towers 165 ft. above the ground and 255 ft. above the near-by lake. The four-wire loop antenna is 80 ft. long, divided into two sections by the down-lead, of the British Admiralty pattern. Water-cooled valves are employed at 15,000 V. anode voltage, and the frequency is crystal controlled. The station's equipment includes a sensitive receiver which will be kept tuned to shipping wavelengths, so that whenever distress signals are heard the broadcasting plant will be shut down. American regulations require all high-power stations to use such a receiver, and, though no similar law is in force in Canada, CKGW has conformed to the requirement.

Advices received in financial circles in the City of London from Canada, says a correspondent of the London *Daily News* "reveal much interest in the Dominion in the statement by Mr. F. G. Kellaway that American telegraph organisations are steadily increasing their hold over the communication systems of North America." Meanwhile the only commercial wireless company operating in Canada is the Canadian Marconi Company, which has a non-exclusive licence issued for one year, and, adds the newspaper's informant: "It is controlled by another Company known as the Canmar Company, in which the largest shareholder is the Radio Corporation of the United States, but their shares do not carry any voting rights. The control of the voting shares in the Canmar Company, which is the actual control, rests with an English banking house; so British control is secured.

"A new factor is the application by the Canadian Pacific Railway to the Canadian Government for permission to enter the wireless business on its own account.

"While the rest of the Empire is thus busy merging, Canada is setting up competitive companies, but it is considered improbable that the Canadian Government will take any steps in the matter until the Imperial Wireless and Cables Conference reports."

CZECHO-SLOVAKIA.—The Ministry of Posts of Czecho-Slovakia has sanctioned the inclusion of the Siemens and Halske Company, which is represented by the Siemens Company, Prague, as a member of the Czecho-Slovak Distant Cable Construction Company of Prague. The participants in the latter have hitherto been the Krizik Company, the Pressburg Cable Works, the Kablo Company and the International Standard Electric Corporation, and its object is to extend the cable communication network in Czecho-Slovakia. The patents concerned are held by the Standard Electric Corporation and the Siemens Company.

DENMARK.—The combined enterprise of the two Danish journals, the *Radiolytteren* and *Popular Radio* have resulted in the opening of a new short-wave broadcasting station in Copenhagen. Its call sign is 7RL and it operates on a wavelength of 42.12 metres, or 7,122 kcs.

The directors of the Great Northern Telegraph Co. Ltd. (of Denmark) propose to distribute a total dividend and bonus of 20%, including the 5% already paid, for the year 1927, and to transfer £30,556 to the reserve and renewal fund, while £37,500 has been allotted to the pension fund. £219,308 is to be carried forward.

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DUTCH EAST INDIES.—The Java Sugar Employers' Union, it is stated by the *Electrical Review*, has applied to the Dutch East Indies Government for permission to use wireless intercommunication between various factories and the Union's offices. The Government has appointed a commission to inquire into the subject.

FRANCE.—The Paris correspondent of the *Daily News* informed its readers that "A kind of dictaphone, which, adjusted to an ordinary telephone, will record phonographically any desired conversation and reproduce it faithfully afterwards, is being issued to French telephone subscribers through the Ministry of Posts and Telegraphs. The apparatus is simple in design and inexpensive and can be installed without affecting the ordinary use of the telephone. It is expected to prove serviceable to business men wishing to preserve records of important calls.

GERMANY.—The exact amount of the deficit for 1927 of the German Inland Telegraphs has not yet been decided upon, but the Ministry of Communications apparently admits a minimum loss of 30,000,000 gold marks (£1,500,000).

The technicians of the German Post Office are working assiduously on direct telephonic and telegraphic communication with the U.S.A. and even further afield.

Readers of these columns are fully aware of the development of telephotography in Germany and could not have been surprised by the *Exchange Telegraph* agency message from Berlin which suggested that machines will be installed shortly in the Central Telegraph Office, London, to enable experiments to be made in the transmission of telegraphic pictures between Berlin and London.

Reports of German Private Companies.—The German Telephone and cable Industry Co., Berlin, reports that favourable activity took place in 1926-27, but sale prices in all branches were insufficient. The decline in telephone deliveries to the Post Office was compensated for by an increase in private telephone work. In the cable department the turnover was higher than in the previous year, and the present stock of orders is satisfactory. Including the balance forward, the net profits amount to 593,000 marks, against 509,000 marks in 1925-26, and the dividend is raised from 6 to 7%.

The Transradio Company for Wireless Oversea Traffic Co., Berlin, states that the existing direct wireless communications were further developed in 1927, these applying to North and South America, the Dutch East Indies, China and Japan. Direct communication with the Philippines was opened last August and working to Siam, Chile and Mexico is in prospect. The net profit was 1,387,000 marks, as compared with 1,388,000 marks in 1926, and the dividend remains at 8%.

The German-Atlantic Telegraph Co., Berlin, states that traffic has increased since the bringing into operation of the cable to the Azores, and the receipts have fulfilled expectations. It is proposed to pay a dividend of 7% for 1927, against nil for 1926.

The North German Cable Works Co., Berlin, recommends the payment of a dividend of 8% for 1927, as in the preceding year. It is also proposed to increase the share capital by the issue of new shares for 2,500,000 marks to provide more working capital to deal with the larger turnover.

A German correspondent states that the wireless section of the Leipzig Spring Fair had grown to so great an extent this year, the number of exhibitors reaching 151, that the radio stalls had to be scattered about among other exhibits of a heavier and quite dissimilar nature, thus the great need in future exhibitions is evidently the provision of a separate hall for wireless exhibits. It appears that this crowding of wireless exhibits is not a new complaint at Leipzig, while the close proximity of working dynamos, motors, high-frequency apparatus, &c., has made it quite impossible for demonstrations to be made. Naturally all radio exhibits were allocated to the Electrical Hall—but !

GREAT BRITAIN.—On April 3 last, eight minutes after a photograph had been taken in London of Queen Souriya at Queen Charlotte's Hospital, it had been transmitted to Manchester by telephotographic apparatus over the underground cable lines between the two cities and appeared in the Manchester *Evening Chronicle*. This may be looked upon as the actual inauguration date, of a daily service of this system between these two important newspaper centres.

It is understood that the Home Secretary, Sir W. Joynson-Hicks took the opportunity, being in Manchester at the time, of seeing the apparatus in operation and congratulated the newspaper proprietors upon their enterprise.

Parliamentary Queries.—These are particularly numerous this month, and have accordingly been somewhat abridged in those cases where this could be done without possible misinterpretation.

On March 20 Sir R. Thomas asked the President of the Board of Trade if he would state what developments had taken place up to the present in the installation of wireless beacons round our coast; and how the costs of establishment and upkeep compared with those of lighthouses.

Sir P. CUNLIFFE-LISTER said that two wireless beacons were now in operation, at Round Island, Scilly, and at Skerries, off the coast of Anglesea, while three, at Caskets, Lundy, and Start, were in course of erection and were expected to be in operation in a few months' time. Several more were projected. He was informed by Trinity House that the first cost of a wireless beacon installation at an existing lighthouse was from £3,500 to £4,500, depending on local conditions, and the estimated cost of maintenance £300 per annum. If a wireless beacon were installed at a place where there was not already a lighthouse, the cost of establishment would be much greater, and the cost of maintenance would be increased to approximately £1,000 per annum.

On March 22, in reply to a number of questions, Mr. Baldwin, the Prime Minister, said that the Government and the Imperial Wireless and Cable Conference had no previous knowledge of the details of and had no responsibility for any financial arrangements for the merging of the Eastern Telegraph and Associated Companies and the Marconi Company. He could make no statement in advance of reports from the Imperial Conference, which, only on March 19, received a proposal from the companies concerned. But, since members had specifically inquired as to the attitude of the Government, he thought it right to say that the Government, while it was prepared to join in discussing measures for a working arrangement, was not committed even in principle, and reserved freedom of action with regard to any proposals for transfer of the operation and control of the Imperial wireless services at present administered by the Government.

On March 26, Mr. Day asked the Secretary for Air whether he would consider the introduction of legislation making it compulsory for all aeroplanes leaving Great Britain for any distance exceeding 1,000 miles to be equipped with wireless equipment and life-saving apparatus.

Sir S. Hoare replied that while in the case of aircraft carrying passengers for hire a reasonable degree of control was clearly required, the policy hitherto pursued as regarded other aircraft had been to leave the activities of pilots unrestricted except in so far as might be necessary in the interestes of persons and property in the vicinity flown over. He considered that it would be undesirable to exercise a more far-reaching and elaborate control over such aircraft.

On March 27 Sir P. Cunliffe-Lister, President of the Board of Trade, in reply to Sir R. Thomas, said that the rotating loop direction-finding system had been developed by the Air Ministry as an aid to navigation. The system had been investigated by the Department of Scientific and Industrial Research, and preliminary trials had been carried out in connexion with marine navigation. The Board of Trade had considered the results of that investigation and were now examining, in conjunction with the Air Ministry and the Trinity House, the question of establishing an experimental station of that type in a position where its utility, as an aid to shipping, could be fully explored. It was hoped to reach a decision on that question very shortly.

On March 27 Sir W. Mitchell-Thomson, Postmaster-General, in reply to Mr. W. Baker, said he understood that no effective remedy had yet been found either in this country or in Germany for interference with broadcasting caused by trams working on the roller-trolley system. Tramway authorities in various parts of the country, notably at Birmingham, Blackpool and Glasgow, were experimenting with various devices, but the experiments were not yet completed. The engineers of the British Broadcasting Corporation and of the Post Office were co-operating with the tramway authorities in an endeavour to find a remedy.

On March 27 Sir H. Brittain asked the Postmaster-General whether his Department had made a close study of the working of the telegraph service in countries where that system was carried out under private enterprise with satisfactory financial results, and whether he would consider introducing certain of those business methods into this country.

Sir W. Mitchell-Thomson said his hon. friend presumably referred to the United States of America. He hopes to arrange shortly for another visit to be made by officers of the Post Office with a view to a close study of the American telegraph service, but it could not be assumed that all the methods in force in the United States would be found suitable for adoption in this country.

On March 27 Sir W. Mitchell-Thomson, in reply to Mr. Wells, said that some of the proposals recommended by the Committee on the Inland Telegraph Service were in fact carried out before the report was received, and arrangements were now in progress for giving effect to others. The remaining proposals affected various interests both external and internal, and a good deal of time would be required for their consideration both by the Government and by the interests affected.

On March 27 Sir W. Mitchell-Thomson, in reply to Sir H. Cowan, said he was aware that the Anglo-Australian beam service, in common with other wireless services, had been criticised on the ground that it was liable to illicit interception. In practice, however, the beam services were worked at so high a speed that interception would only be possible by means of complicated and expensive receiving apparatus requiring expert operating staff. Therefore the risk of illegal interception was negligible.

On March 27 Mr. Pilcher asked the Postmaster-General if he would state whether, and, if so, what, reductions in cost of cable messages to India and South Africa had been conceded since the introduction of beam competition during the past year.

Sir W. Mitchell-Thomson said that a year ago the cable rates to India and South Africa were 1*s.* 8*d.* a word and 2*s.* a word respectively. The present rates to India were 1*s.* 5*d.* by cable and 1*s.* 1*d.* by beam; and the rates to South Africa were 1*s.* 8*d.* by cable and 1*s.* 4*d.* by beam. Corresponding reductions had been made in the rates for deferred telegrams and letter telegrams. No statement could be made concerning future rates until the report of the Imperial Wireless and Cable Conference had been received and considered.

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On March 27 Sir W. Mitchell-Thomson informed Mr. Everard that the British Broadcasting Corporation was authorised last September to undertake experiments in broadcasting on a short wavelength. Those experiments were still in progress, and the results had not yet been reported.

On March 27 Captain Carro-Jones asked whether steps were being taken towards establishing a broadcasting service receivable on sets of moderate cost in such places as West Africa and East and Central African Colonies, where thousands of British citizens were in remote and lonely stations.

Mr. Penny said that the difficulty in providing such a service lay not in the transmission but in the reception. The British Broadcasting Corporation had been conducting almost daily transmissions from its short-wave station, 5SW, ever since Dec. 12 last, and those programmes had been heard from time to time throughout Africa and elsewhere. He understood from the Corporation, however, that prolonged experiments under varying conditions were likely to be required before suitable receiving machinery could be evolved. The Government could obviously give little help in that matter, but the Colonial Governments were co-operating by forwarding reports on local reception.

On March 29 Mr. W. Baker asked the Prime Minister what guarantees existed to prevent the transfer of privately-owned cable and wireless companies, which formed integral parts of the system of imperial communications here and in the Dominions and elsewhere, to foreign ownership or control; and whether he was satisfied that the terms of the existing licences and agreements were sufficient to safeguard the national interest.

Mr. Baldwin said he could not answer as regarded the position of the other Governments concerned, but all licences for cable or wireless services granted by the British Government contained a provision that the licensed company should not assign or dispose of the licence or of any benefit arising from it without the consent of the Government. The question whether any further safeguards were necessary would be considered when the report of the Imperial Wireless and Cable Conference had been received.

On March 29 Lord Wolmer, the Assistant Postmaster-General, informed Mr. MacKenzie Livingstone that candidates for the Post Office certificate of proficiency in wireless telegraphy required by all wireless operators on British merchant ships, were trained at specially licensed schools and were examined by the Post Office. So far as he was aware, there was no scarcity of students or of successful candidates. Operators for coast wireless stations or for other Post Office wireless services were trained by the Post Office, which had a large staff of telegraphists to draw upon.

On April 3 Sir Robert Thomas asked the Postmaster-General whether, in view of the fact that messages sent by wireless telephony between Western Canada and Great Britain were at present relayed through the United States, he could state when it was intended to establish an all-Canada route.

Sir W. Mitchell-Thomson said that the use of the "beam" system for telephonic transmission was still in the experimental stage, and he could not therefore say when a direct service might be practicable.

Altogether, one would wish to add that Members of Parliament have been taking the keenest interest in matters telegraphic lately and especially on the radio side!

Broadcasting the Grand National.—The following interesting particulars regarding this unique effort of the B.B.C., may not be without interest to our many radio enthusiasts, and have been usefully condensed by our contemporary the *Electrical Review*..

"For broadcasting a running commentary on the Grand National horse race at Aintree six microphones were utilised. Three of them were specially constructed, measuring only 2 by 1½ in., and could be accommodated comfortably in the palm of the hand; but as the commentator required both hands free to use his field-glasses, the microphones were clamped to and iron rail and spaced over a distance of about 2½ feet, so that the commentator turned his head to follow the horses one or other was within 6 in. of his mouth. These diminutive instruments are not as sensitive as the normal type, but the quality is declared to be as good as any that has hitherto been obtainable by wireless, and the use of "insensitive" microphones was intended to enable the crowd effect to be more carefully controlled, so that the speech would not be drowned by the incidental noises of the course. It must be remembered that the commentator spoke in the midst of a noisy and enthusiastic crowd. A separate microphone was used for preliminary announcements, and two others were placed in front of the stand to pick up crowd noises and to be in reserve for the commentators if required."

The *Daily Telegraph* states that during the 12 months ending March next the Post Office expects to be in a position to make a bigger grant to the British Broadcasting Corporation. It will amount to £880,000, and it exceeds the figure for the current financial year by £75,000. From the revenue which the Post Office receives from wireless licences it first deducts 12½% for the cost of collection, and it then pays over to the broadcasting authorities 90% of the balance as regards the first million licences, 80% as regards the second million, and 70% as regards the third million.

The net profit of *The Direct Spanish Telegraph Co. Ltd.* for the year ended Dec. 31, 1927, was £10,548 (including £900 brought forward). The usual dividend of 10%, free of tax, is paid on the ordinary shares and £1,083 is carried forward.

The directors of *The Indo-European Telegraph Co., Ltd.* recommend a final dividend of £1 2*s*. 6*d*. per share, making 7% for the year, together with a bonus of 15*s*. per share, making the total distribution for the past year 10%, all free of tax, as for the preceding year.

British Private Companies.—Mr. F. G. Kellaway presided at the annual meeting of the Marconi International Marine Communication Co., Ltd., on March 30, and in the course of his speech said that the absence of Senatore Marconi was due to ill-health. Dealing with the accounts, the Chairman pointed out that the Company had no prior charges, debentures or bank loan, and had £600,000 invested in Government securities. There had been important technical developments during the year, one of which was the decision of the Government to make the fitting of an auto-alarm device compulsory on all ships carrying between 50 and 200 passengers.

Referring to the cable-wireless merger, Mr. Kellaway said that it was imperative that the external communications of the United Kingdom should be operated as one unit, and he mentioned what was being done in the way of co-ordination in the United States. In conclusion, he said that the company's net profit during the past three years had steadily progressed; in 1925 it was £118,979, in 1926 £126,132 and in 1927 £179,730. There were good grounds for believing that the progress would continue. The report itself makes reference to the appointment of Sir Wm. Slingo to the Board of Directors.

The report of the Anglo-Portuguese Telephone Co., Ltd., for 1927 shows a net profit of £31,412, as compared with £32,773 in 1926. A final ordinary dividend of 5% is recommended, making 8% for the year (against 7%), and £57,801 is to be carried forward. At the beginning of the current year the company received a new 40-year concession from the Portuguese Government, and provision is made for an extension of 25 years. Meeting, April 3.

Sir Alexander Roger (Chairman), presiding at the annual meeting of the Cable Telephone and General Trust, Ltd., on March 26, said that the issued capital at the end of 1927 was £446,442, the whole of which had been invested. The net revenue for the year was £12,250, and after paying the dividends on the preference shares a balance of £985 was carried forward. Less than one-tenth of the Trust's investments were in foreign concerns. During the year Mr. John Lee, C.B.E., and Mr. H. S. Bennett, A.M.I.E.E., had joined the board.

At an extraordinary meeting on March 29 of the Telegraph Construction and Maintenance Co., Ltd., a resolution adopting the new articles of association was passed. The Chairman (the Earl of Selbourne) mentioned that since the annual meeting on March 1 the company had received an order for the construction and laying of a new Transatlantic cable of a special loaded type for the Western Union Telegraph Co.

(See also under U.S.A.)

HOLLAND.—Reuter's Agency reports that a recent demonstration of radio-telephone communication between The Hague and Batavia took place and is reported to have been most successful; conversations were carried on with perfect audibility in both directions, and voices could be readily recognised. Among those who attended the demonstration were Mynheer Plemp van Duiveland, of the Netherlands Foreign Office, and Mynheer M. M. Damme, Director-General of Posts and Telegraphs.

ITALY.—Reuter's Agency informs us from Rome that a Royal Decree has been published at Rome putting into execution the British-Italian Telegraph Convention which was signed in Paris on Oct. 21, 1925.

NEW ZEALAND.—According to the *Auckland Weekly News*, Mr. H. H. Hammond, K.C., Chairman of the Federal Royal Commission on Wireless, recently stated that Amalgamated Wireless, Ltd., of Australia, was investigating the validity of the use of certain patented devices by various broadcasting companies in Australia and New Zealand, and it was feared that unless some arrangement were reached litigation would have to be resorted to. It was claimed by the company that no efficient broadcasting station could operate without utilising some patent of which it was the owner. Litigation was already in progress in Australia with regard to the use of patented devices, and it was understood that legal action was threatened in New Zealand. If the Amalgamated Wireless was correct in its contention, the operations of the New Zealand Broadcasting Company would be questioned. If it were true that patented devices were being used some equitable arrangement would have to be made. The company's demands were being disputed vigorously in Australia and there was no doubt the same opposition would be met in New Zealand if action were taken there. The company previously received 12*s*. 6*d* on each valve-holder in every receiving set, but as an outcome of the Royal Commission's report nothing was to be received for five years. In the meantime the validity of the patent was to be decided.

PERSIA.—We learn, upon high technical authority, that a new set of thermionic valves having been installed, the Teheran wireless station is again in working order and in communication with Beirut, Angora, and Kabul.

SWITZERLAND.—The Communications and Transit Commission of the League of Nations has completed its report on the proposal to establish at Geneva a radio-telegraph station powerful enough to enable the League to keep in touch with practically all its member States in times of crisis. It is estimated that the station would cost £50,000 to construct and £8,000 a year to maintain.

SWEDEN. From the *Swedish Economic Review* we learn that telephone and telegraph apparatus to the value of 9,819,000 kr. was exported during the year ended December, 1927, as against 7,434,000 kr. in 1926.

U.S.A.—A new loaded telegraph cable is to be laid between Newfoundland and the Azores by the Western Union Telegraph Co. of America. It has been specially designed for duplex working at high speed..

(See also under GREAT BRITAIN.)

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Reuter's Trade Service informs us from Chicago that new methods of wrapping cables, which make it possible to hear sounds from under water by induction, were demonstrated at Chicago by Mr. Charles R. Withers, an electrician. The inventor said the Navy Department had agreed to test the device, which is called the Inductaphone. At a demonstration of the invention for the United States Coast Guard, Mr. Withers submerged a cable to which were attached automatic sending and receiving sets; another cable dragged through the water over the submerged one, picked up messages from the set by induction."

One wonders whether future developments of this idea may not some day render possible the tapping even of deep sea telegraph cables by means of high amplification.

Personal and other items.—It is reassuring to note from time to time mention of the renewed activities of the late Controller of the C.T.O., evidence, it is most sincerely hoped, of a complete return to normal health and strength, thus: "The staff of the Automatic Telephone Manufacturing Co., Ltd., held their fifth annual dinner on March 23, at the Exchange Hotel, Liverpool. The Chair was occupied by Mr J. Lee, C.B.E., late Controller of the Central Telegraph Office, London. The toast of "The Company" was proposed by Sir Max Muspratt, Bt., Mr. John Lee responding. "Our Guests," proposed by Mr. G. W. Moore, and acknowledged by Mr. Powell-Jones, Secretary of the Telephone Development Association, completed the toasts. A musical programme followed.

The following changes have taken place in the administration of the International Telephone and Telegraph Corporation, according to the *Electrical Review*, and while felicitating all concerned, it is towards the modest Mr. F. Gill that many Post Office folk will first direct their bouquets:—

Mr. F. Gill has been elected a vice-president in the International Telephone and Telegraph Corporation. He retains his position on the board of Standard Telephones and Cables, Ltd. Mr. G. Deakin has been appointed first assistant chief engineer in the International Corporation, but he retains his position on the board of *Le Matériel Téléphonique*, Paris. Mr. G. H. Nash, C.B.E., has been appointed European chief engineer in the International Standard Electric Corporation, and he retains his position on the board of Standard Telephones & Cables, Ltd. Mr. P. E. Erikson has been appointed assistant vice-president in the International Standard Electric Corporation, and Mr. E. S. Byng has been appointed European Director of Installation in the same Corporation.

The kindest of kind thoughts will surely follow "Chris" Jenner, Asst. Supt., Cable Room, into his well-earned retirement. A "white" man through and through, and than whom the Department never had a more faithful servant, or the staff a real friend.

The *Electrician*, in a leaderette, recently directed attention to the part now played by electricity in the gramophone industry and specially by devices and apparatus so intimately associated with radio science. "To-day," says our contemporary, "we find electrical principles behind the greatest improvements in recording, and we also find some elements playing no small part in the reproduction of records by means of audio-frequency amplifiers and loudspeakers." . . . "Similar equipment," continues the journal, "is being used by cinemas to amplify organ music throughout various parts of of the buildings. The electrical 'pick-up' is also popular with the rapidly-growing proportion of the public in possession of wireless receivers and for gramophones, for by its means simple experiments are possible. Such experiments appeal to those wireless enthusiasts who have hitherto ignored the gramophone on account of its purely mechanical operation.'"

No. 2 of *Television* is equally good with that of the first issue, and contains a photograph of the Engineer-in-Chief of the General Post Office, Col. T. F. Purves, M.I.E.E., who unstintedly wishes success to the enterprise. It also very favourably reviews "Practical Television," by Mr. E. T. Larner, A.M.I.E.E., also of the Engineering Department, G.P.O. Not least among the interesting matter is an article by Dr. E. F. W. Alexanderson, Chief Consulting Engineer to the General Electric Company, on "The G.E.C.'s Recent Television Experiments in America.

It is also pleasing to note the frank and chivalrous admissions by prominent newspapers of the pioneer work done by Mr. J. L. Baird. Says the New York *Herald-Tribune* of Feb. 12: "When engineers in New York successfully demonstrated television on a telephone line about 200 miles long between New York and Washington, Baird showed he could do the same thing by screening pictures in Glasgow of persons in London, a distance of 400 miles. It is said that probably one thousand engineers and laboratory men were involved in the American tests. Only a dozen worked with Baird."

In commenting on "Cinema Pictures by Wire" and the fact that a moving picture film was sent over a telephone wire from Chicago to New York and there developed ready for use exactly an hour and 35 minutes after it had been "shot" in a Chicago studio, the *Electrician* writes: "The electrical engineer devised a means of sending pictures by telephone overland," &c. Why "by telephone"?

Advice to Radio Amateurs.—I consider that the most fertile fields of radio for the amateur experimenter and young engineer just out of college are short waves, directive transmission and television. I believe television is finally emerging from the laboratories. It will be seen in homes throughout the land, but I do not know how soon.—Senatore G. Marconi.

J. J. T.

A BRIEF CHRONOLOGY FOR STUDENTS OF TELEGRAPHS, TELEPHONES AND POSTS.

BY HARRY G. SELLARS.

(*Continued from page* 130.)

1838, July ... John Bethell introduced and patented the process of creosoting timber.

(J. H. Kyan used mercuric chloride for preserving telegraph poles. Sir William Burnett utilised a solution of zinc chloride. J. J. Lloyd Marjary and Dr. Boucherie made use of sulphate of copper.)

C. G. Page, of Salem, U.S.A., and MacGauley, of Dublin, devised self-acting current interrupters.

Page observed that a magnet emitted sounds during magnetisation.

Morse suggested a telegraph system composed of five recording pens connected to five lines. He was refused a patent in England owing to the existence of similar ideas.

1838, Sept. ... Travelling Post Office established between London and Bletchley. Extended to Preston in October.

Committee of the House of Commons appointed to enquire into the suggested telegraph cable between England and France. Experiments carried out at Brussels Observatory proved unsatisfactory.

Major-Gen. Sir G. W. Pasley carried out experiments with electrical signalling under water in the river Medway at Chatham.

Jacobi calculated the wastage of zinc in a battery. He, like Lenz, thought the magnetism of an electro-magnet was proportional to the current and the number of turns in the coil.

Jacobi tried magnetic propulsion and, assisted by Klein, introduced the electro-deposition of iron.

Simple semaphores adopted for railway signalling.

1838, Dec. 6 ... Postmaster-General took over the Money Order Offices, Messrs. Watts and Lees being granted compensation amounting to over £400 and £500 per annum respectively. Rates of commission ranged from 6*d.* for £2 to 1*s.* 6*d.* for £5.

1839, March ... Spring Rice, Chancellor of the Exchequer, paved the way for Penny Postage in his Budget, and estimated the loss at about £700,000.

Postage varied from 4*d.* to 13*d.*, according to distance. Twopenny post to places within 3 miles of General Post Office, threepenny post to places within 12 miles. Number of letters passing through post, 82,000,000.

Charge for redirection of "unfranked" letters was that normally charged for the second journey.

Special Indian Mail Service commenced via Calais and Marseilles in the charge of a British officer, coaches being used through France.

1839, May 4 ... Samuel Cunard contracted to carry mails between England and America by steamships, the Admiralty undertaking to pay a subsidy of £55,000.

1839, June ... Scheme of registration of letters arranged to come into force on this date abandoned, owing to proposed reductions in postage.

Cooke and Wheatstone used a telegraph apparatus consisting of two needles only.

Araga explained Morse's telegraph apparatus to members of the French Academy of Sciences.

J. P. Wagner and Neef invented a self-acting current maker and breaker.

Sir W. Grove produced a battery composed of platinum electrodes surrounded with hydrogen and oxygen gas respectively, and another made up of platinum, zinc, nitric acid and sulphuric acid.

1839, July 12 ... Mr. Goulbourn's motion for the postponement of the Penny Postage Bill defeated in the House of Commons by 213 votes to 113.

1839, July 29 ... Postage Bill passed by House of Commons.

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1839, Aug. 8 ... Postage Bill passed by House of Lords.

1839, Aug. 17 ... Penny Postage Bill signed.

Dr. O'Shaughnessy (afterwards Sir William Brooke O'Shaughnessy) succeeded in passing a current through a wire covered with pitch and tarred hemp across the river Hoogly, a distance of 1½ miles. (He designed the first telegraph apparatus used in India, consisting of a horizontal galvanometer and an upright mirror in which the movements of the galvanometer needle were reflected.)

Telegraph cables laid in iron piping on the Great Western Railway, and Paddington-West Drayton telegraph line extended to Slough.

Jacobi propelled a boat along the Neva at 2½ miles an hour with an electro-motor of about one horse-power actuated by a battery of 64 Grove cells.

Jacobi, of St. Petersburg, Spencer, of Liverpool, and Jordan, of London, working independently, and following de la Rue's discovery, obtained impressions of various articles by the electrolysis of copper. Murray used moulds of plaster coated with plumbago on which to obtain the deposit. Jacobi coined the expression "galvano-plastic" to describe the process, but ultimately the term "electrotyping" was adopted.

1839, Dec. 5 ... Postage by weight came into force at rates which worked out at 4*d*. for each of the first two half-ounces and 8*d*. for each additional ounce. Limit 16 oz.

Entry of letters containing coin or jewellery on letter bills ceased.

Charles Goodyear, of U.S.A., invented a method of vulcanising india-rubber. (Hooper used it for submarine and underground cables.)

188,000 Money Orders were issued.

1840, Jan. 10 ... Postage rate reduced from 4*d*. to 1*d*. Number of letters passing through post, 169,000,000.

1840, May 1 ... Mulready postage envelope issued.

Messrs. Elkington commercialised electro-plating processes devised by Wollaston and Brugnatelli.

Wheatstone suggested to a Select Committee of the House of Commons on Railways the construction of a Dover-Calais submarine telegraph, and drew up details for making a tarred and pitched submarine cable. He invented his A.B.C. telegraph apparatus and an electro-magnetic telegraph clock.

Cooke and Wheatstone devised ring insulators for telegraph wires.

E. A. Cooper constructed a writing telegraph instrument, but it was not suitable for practical use.

J. P. Joule made electro-magnets capable of lifting heavy weights.

Lamont (and Frolich) showed that the strength of an electro-magnet depends upon the form, quality and quantity of the iron, and the number of ampere-turns.

1840 ... ... Smee constructed a platinum and zinc battery.

Baron Schilling, Russian attachè at Munich, introduced a magnetised needle telegraph apparatus, working on a metallic circuit, the sending key of which sent negative or positive currents to line. The movements of the needle exposed a white or black disc, the operator writing W or B as the case may be, combinations of these two making up an alphabet, *e.g.*,BW = A, B = E, BB = I, BWB = O, WWB = U, &c.

Armstrong discovered, and Faraday explained the electrical effects produced by high-pressure steam. Hydro-electrical machine constructed.

1840, Nov. ... Commission on Money Orders reduced to a scale of 3*d*. for £2 to 6*d*. for £5.

Redirection charged for at the ordinary postage rate.

"Franking" abolished. Cost had reached £80,000 per annum.

587,000 Money Orders were issued.

Joseph Henry produced high-frequency oscillations by the discharge of a condenser and demonstrated the great distance at which the inductive effect of a discharge of electricity could be felt.

(Cailletet discovered that compressed air resists the passage of an electric spark.

Kinnersley devised an electric thermometer for illustrating the repulsive power of electricity as exerted on air.)

1841, Jan. 1 ... Envelopes embossed with stamps introduced.

1841, Jan. 6 ... Registered letters accepted at a fee of one shilling but liability of Post Office not admitted.

1841, Aug. 13 Treasury decided that the number of Post Offices should be "somewhat in proportion of the amount of population and extent of service combined." The Postmaster-General did not support this view in its entirety.

F. de Moleyns invented an electric glow-lamp with platinum filament.

Poggendorff devised the potentiometer.

J. P. Joule showed that the heat produced electrically in a conductor is proportional to the square of the current strength and produced a calorimeter.

(Ernst Siemens proposed that the electric unit of heat should be called a "Joule.")

Lenz also investigated the development of heat by an electric current.

Joule found that an iron bar increased in length when magnetised.

Wheatstone patented his A.B.C., or step-by-step, telegraph, composed of two dials marked with the alphabet and punctuations, and furnished with indicating needles. By depressing keys corresponding to the required letters, and turning at the same time the handle of a magneto generator, currents were sent which actuated the pointer at the distant end and spelled out the words.

Gustave Froment, of Paris, introduced a telegraph apparatus similar to Wheatstone's A.B.C., but with a piano keyboard. Froment also devised a recording telegraph in which a needle, responding to movements of a sending wheel, produced marks on paper tape similar to those of the syphon recorder.

Ernst Siemens telegraph apparatus, which was similar to Wheatstone's A.B.C. was brought into use on the German State railways.

(W. S. Steljes improved Wheatstone's A.B.C. system by substituting a typewheel printing receiver for the receiving dial. In the Rebesi system the A.B.C. commutator was replaced by a typewriter keyboard.)

Wheatstone proposed an arrangement for the division of line time, or multiplex telegraph working.

Alexander Bain, of Edinburgh, took out a patent for a typewriting telegraph system.

Post Office proposed compulsory registration of letters found in the post containing coin or jewellery. Sir Rowland Hill (then at the Treasury) made a counter-proposal to reduce registration to 6*d*. and ultimately to 2*d*.

1841, Dec. 31 Sixty registered letters sent from London daily, and 1,170 delivered in London weekly.

1,500,000 Money Orders were issued.

1842 ... ... Morse, in New York, attempted to send signals through a submerged conductor.

Watson erected a semaphore station near London Bridge for the purpose of communicating with Deal.

Jeffrey patented the marine glue which is used to coat the inner lining of a Daniell battery.

Dr. Montgomery, of the Indian Medical Service, introduced gutterpercha.

Bunsen devised a battery made up of carbon, zinc, nitric acid and sulphuric acid.

Sir Rowland Hill left the Treasury.

Henry and Reiss pointed out that the discharge of a Leyden jar was not a sudden and complete levelling up of the difference of potential between the coatings of the jar, but rather partook of the nature of a principal discharge in one direction and then a series of surgings backwards and forwards until equilibrium was attained.

(Feddersen, Lodge and Paalzow, in 1876, proved the existence of these waves during discharge and showed that, as the resistance of the circuit increased, the number of these alternating discharges decreased, but, at the same time, their duration was greater.)

(*To be continued.*)

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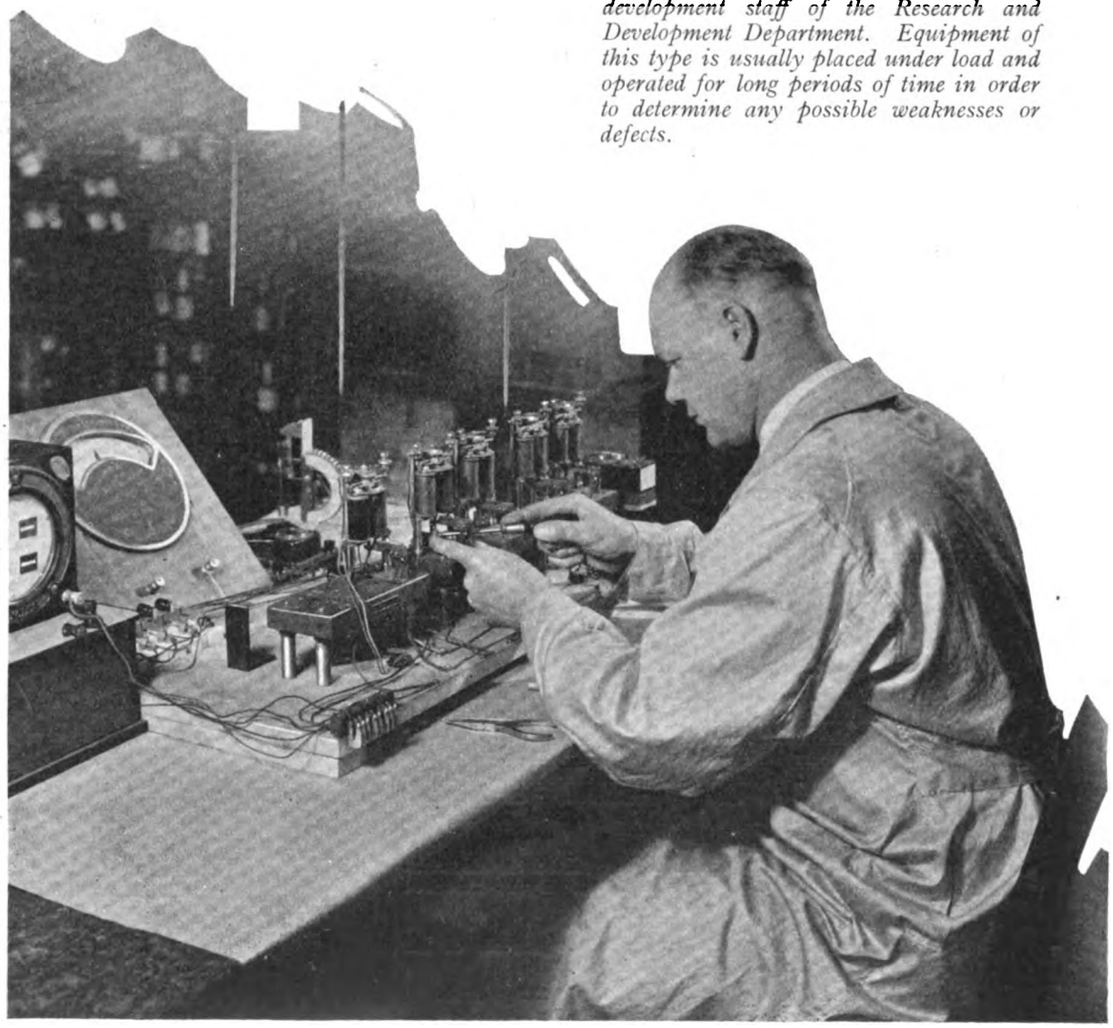
Where Strowger Autom

The Develop

Here is shown a multi-frequency ringing device being tested by a member of the development staff of the Research and Development Department. Equipment of this type is usually placed under load and operated for long periods of time in order to determine any possible weaknesses or defects.



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The
Telegraph and Telephone Journal.

PUBLISHED MONTHLY IN THE INTERESTS OF THE TELEGRAPH AND TELEPHONE SERVICE, UNDER THE PATRONAGE OF THE POSTMASTER-GENERAL.

Editing and Organising Committee - - - J. STUART JONES. W. D. SHARP. J. F. STIRLING. W. A. VALENTINE. J. W. WISSENDEN.

Managing Editor - - - W. H. GUNSTON.

NOTICES.

As the object of the JOURNAL *is the interchange of information on all subjects affecting the Telegraph and Telephone Service, the Managing Editor will be glad to consider contributions, and all communications together with photographs, diagrams, or other illustrations, should be addressed to him at the G.P.O. North, London, E.C.*1. *The Managing Editor will not be responsible for any manuscripts which he finds himself unable to use, but he will take the utmost care to return such manuscripts as promptly as possible. Photographs illustrating accepted articles will be returned if desired.*

VOL. XIV. MAY, 1928. No. 158.

DEVELOPMENT STUDIES.

IN the prediction of the future development of telephony the lost art of prophecy would be an undoubted boon. But it is necessary to prescribe that such prophecy would have to be of a more precise and documented nature than those oracles of antiquity which require armies of learned expositors and reams of exegesis to expound their true import. It would be necessary, for instance, to make sure whether the Valley of Potsherds signified Flacton, or Mudbury or Great Bagford, and whether the ten horns of any given apocalyptic beast meant ten score or ten thousand lines in 20 years' time. Failing the authentic prophetic method, we have to resort to forecasts founded on such facts as diligence can glean, and corrected and amplified by that "courage, logic and foresight" to which Mr. MACLURE refers in the interesting paper which we reprint elsewhere.

The necessity of furnishing accurate forecasts of future development, in view of the costly extensions of buildings and plant necessary to provide for it, is self-evident; but the task is one of surpassing difficulty and, as Mr. MACLURE says, the result "can never under the best of circumstances represent more than an intelligent guess." Incalculable factors, as he demonstrates, are met with at every turn. The transfer of large properties from lethargic to energetic hands, the building of a new bridge over the river which will facilitate the creation of a new suburb on the other side, the construction of a new arterial road which will bring fresh life to a sleepy town, the establishment of a new industry which, on the one hand, may convert a village into an industrial centre, or, on the other, depreciate the residential value of a district for which development had been planned on a residential basis, any of these factors, which may well arise within a period of 11 or 21 years in a certain proportion of cases, will tend to upset the best-laid schemes. It is the aim of the officer engaged on the survey to "get wind" of such coming events, but this is not and cannot be always possible. Fortunately, the more revolutionary developments do not frequently take place, and the "intelligent guess" based on the careful collection of facts, serves its useful purpose in the majority of cases.

There is, however, one incalculable factor, peculiar, we think, to this problem, to which the paper in question does not refer. We believe that in the telephone development of all countries there comes a stage when the public, realising that some 60 or 70% of their acquaintances are "on the telephone," feel a strong and insistent need to join the majority. All business people nowadays have a telephone installed as a matter of course. It is a recognised economic necessity. But a large number of the residential population, under the erroneous impression that they cannot afford it, consider the telephone a luxury. A period will come when, learning that the majority of their neighbours can afford the telephone and find it indispensable, the residue will also believe it to be as much a necessity as gas, electric light, or water. Not all the arguments of persuasive advertisements or contract officers will appeal to them so strongly as this belief, and then—at an unpredictable moment—telephone development will suddenly increase at the rate of 20 or 30% each year, and all development studies will have to be reconsidered. This theory is, of course, difficult to prove, but it may be mentioned in illustration that in 1907 the Bell system in the United States increased from 3.1 to 3.8 million stations (having risen from 2 million to 3.1 million during the previous two years) and was more than doubled in the five succeeding years. In other words, it was precisely when American telephone development began to reach a high degree of density that there was the greatest rush to be connected with the system.

HIC ET UBIQUE.

A "THROUGH" circuit has now been provided between London and Copenhagen and the charge for a three minutes' day call between those places reduced to 13*s*. 3*d*.

According to the Department of Overseas Trade report on Belgium, the automatic exchange system has made great progress. There are now four exchanges opened in Brussels, whilst a fifth is almost completed. The entire Brussels system will be automatic by 1929. There will then be eight exchanges, each with a capacity of 10,000 lines.

At Antwerp the automatic system is also being extended to the whole area. There will be five exchanges. The system is likewise to be applied to the large towns, such as Liége, Ghent and Charleroi, and for the sake of experience to a certain number of secondary exchanges. Three of these latter have already been opened.

The transatlantic service was extended last month to several additional towns in Ontario and Quebec. It was also extended to St. John (New Brunswick), Halifax (Nova Scotia), charge for three-minute call £9 12*s*.; to Winnipeg (Manitoba) £10 4*s*.; to Calgary and Edmonton (Alberta) £10 16*s*.; to Regina (Saskatchewan) £10 16*s*.; and to Vancouver, B.C., £11 8*s*.

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The transatlantic telephone service between Belgium, France, Germany, Holland and Sweden on the one hand, and United States of America and Cuba on the other, has now been extended to all the above-mentioned places in the Dominion of Canada.

We have received the first three numbers of *Sino Azul*, a journal published under the auspices of the Companhia Telephonica Brasileira, Rio de Janeiro. It deals with the activities of the company, with the progress of telephony generally, and

with the doings of the company's staff. We reproduce the cover of the February issue, a Carnival number, from which it will be seen that our new contemporary is artistic as well as informative.

"Entertainments at which we have never assisted." The Postmaster-General giving the first wrong number at the opening of a new exchange.—(*Punch*, April 18.) "There are now 6,748 subscribers in ——; we expect this is a wrong number."—"A new telephone exchange has been opened at ——; what a storehouse of wrong numbers!"—"The new telephone directory is just out. We wonder how many wrong numbers it contains!"—(Any paper, any date.)

OBSESSION. A GHAZAL.
Humorist loquitur.

Wrong numbers always by exchanges *must* be given.
Shall not to that fond legend all my trust be given
Since I at least one joke a week obtain
Which may in comic papers with such gust be given
That careless readers cut and come again,
Rejoiced to meet old friends? If a shrewd thrust be given
At telephones (State-owned), who shall complain?
If blame alike to the unjust and just be given,
Why, 'tis a world which I did not ordain,
And that no crumb of praise but only crust be given
I care not, but shall sing the old refrain
Till to the earth my body, dust to dust, be given.

W. H. G.

TELEPHONE DEVELOPMENT STUDIES.*

BY H. J. MACLURE, M.B.E.

THERE can be few commercial undertakings in connexion with which it is necessary to look so far ahead as is required where telephone service is concerned, and to add to the difficulties involved it may be claimed that from the past there is less to be learned than is the case in probably any other branch of trade or public service. What has gone before may, in fact, if allowed too much weight, engender false impressions. In other words, our telephone past is too limited to be of much use in the matter of guiding our telephone future and, like other pasts, may have disadvantages.

May I remark at the outset that a telephone development forecast can never, even under the best of circumstances, represent more than an intelligent guess. But that guess should have its foundations resting on solid facts and it is only by the careful collection of facts and a reasoned use of them in the light of common sense and with the aid of courage, logic and foresight that anything in the nature of a satisfactory forecast can be arrived at.

One of the advantages of addressing the Telephone and Telegraph Society of London is that one can, within reasonable limits, express one's personal views—rather a favourite habit of mine—and I am quite prepared to believe as regards this paper that some people—those, for example, who hold the official purse strings—may not see eye to eye with me at the moment in some of my personal opinions, although—this is a forecast—they will be brought to my way of thinking in the end.

There was a time in the very early days when scant attention was paid to anything in the nature of the provision of plant for future growth. Enough apparatus was made available for the time being and it was added to as occasion required. Then, when switchboards became larger, some rough guess was made in the office as to future growth, but there was nothing more in it than that. The next step in the march of progress, when an estimate of future growth was required, was to go out and view the ground and make another guess—a very elementary method. Later on, when underground ducts and cables came more and more into the scheme of things, it was found necessary to look 8 and 15 years ahead, and the first system of making block surveys was evolved; but those who supplied the resulting forecasts were not asked to be too exact in respect of the 15-year figure.

Things were not taken too seriously in those days. I remember the laying of the first length, some 50 yards, of lead-covered dry-core cable. The careful and thoughtful engineer who wished to make sure of the actual length had the cable uncoiled from the drum and laid flat in the street prior to making a start to draw it into the pipe. The cable lay out just long enough for a Colman's Mustard cart—well loaded up—to run over it, with unhappy results. The Reading District also once lost a length of cable. That, too, was laid out—in a field—to enable the conscientious foreman to check its length by the aid of a two-foot rule. Whether he went to dinner and subsequently failed to re-locate the field, or got sacked for some cause, history does not state; but in the end the grass grew, covered the cable, and it was lost and not found until the farmer was cutting his hay, when he wrote to the company to remove its "gaspiping." All this, however, by the way.

As I have said, at one time 15 years was the forecast limit. Then came the time we were asked to cover 20 years. This limit stood for quite a long time, but later 21 years became the general standard, with 26 years in particular cases. Now a 36-year forecast is frequently called for, and a few weeks ago I was asked in all seriousness for a forecast in a particular case covering 42 years ahead.

The early Block Surveys were made in the following manner. A Contract Officer, not always the man whose canvassing area was concerned, was given a set of maps—usually 6-in. scale—on which the exchange area was supposed to be marked—I say "supposed" because I have known a good many instances when the information was omitted, this, of course, being quite wrong—and on which were marked the approximate positions of the various D.P.'s.† These were indicated by a domino divided into three parts. In the top space was shown the number of existing circuits and the Contract Officer was required to fill in in the two blank spaces below the numbers of circuits he calculated would exist at the 8 and 15 years periods. He was supposed to make all enquiry possible as to the future trend of events and to form his opinions accordingly.

Taking into account the haphazard methods of the early days, some of the forecasts produced were, as events turned out, surprisingly accurate. On the other hand many were wholly misleading. Needless to say, the individual efforts of some of the Contract Officers produced weird results. I remember one Contract Officer whose canvassing results had for some time been falling off. Then Headquarters asked for a number of areas to be block-surveyed, and Brown, as we will call him, asked to be put on one of the studies. I was not very enthusiastic in the matter because, while Brown had always been somewhat different in his ways from the ordinary run of Contract Officers, it seemed to me that for some time his views had been getting even more unusual than before, and his references

* Paper read before the Post Office Telephone and Telegraph Society of London.

† Distributing poles.

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to the Scriptures—at all times pretty frequent—a little too marked. However, I thought I would try him, and for reasons of caution I selected an area of which I had intimate knowledge. In due course Brown handed in his forecast. In a moment I saw it was hopeless. On examining his maps I saw that he had shown a development of 36 lines in a cemetery, and none for a locality where there were a number of good houses. I asked Brown about this, and he explained that he must have passed the houses without noticing them when thinking of higher things, and that thoughts of the Day of Judgment engendered by sitting in the cemetery during lunch accounted for the 36 lines. I saw to it that he got a week's pay and left that day.

As late as the first quarter in 1924 districts were accorded permission to dispense, in certain circumstances, with block surveys when furnishing a development forecast. I opposed this ruling to the last fence but was defeated.

It was not until the latter part of 1924 that Field Officers were given a real guide as to future intentions in the matter of the development of the Service. Up to then, although I had for a long time used every means in my power to secure this lead, the only instructions available tended to encourage the submission of depressed forecasts.

In June, 1925, the method of making block surveys was standardised by the introduction of the "tenancy" system of compiling them, but until about June, 1926, when Development Officers were first appointed, it was still the practice to require canvassing Contract Officers to carry out the actual field work of any block survey arising within their own canvassing areas. This practice—rendered necessary in the first instance by the system of commission payment in connexion with new orders—resulted in men being required, in some instances, at least, to deal with work for which they were wholly unsuited. The assumption, of course, was that the man on the ground should be the best judge of its future prospects, but the important fact was lost sight of that the qualities which go to make a salesman are of little or no value in estimating what is going to happen in the case of existing buildings under short leases and undeveloped land.

Thus, with forecasts in some instances—

(1) not based on a block survey of any sort;
(2) even when based on a block survey, the work carried out by an officer unsuited for the duty;
(3) however formulated, those concerned with the work encouraged to avoid the least optimism and at the same time deprived of any general lead as regards the future;

can it be wondered at that many forecasts have proved fallacious?

Presumably all here present know how a "Tenancy" survey is staged, but in case there is anyone who does not or would like a reminder I will just touch on the main points.

The officer who (London excepted) nowadays carries out a block survey is a Contract Officer, Class II; he carries a development allowance and may not canvass for orders or receive commission under any circumstances during the period of his employment as a Development Officer.

He is supplied with—

(1) a copy of the map or maps covering the ground which he is to survey;
(2) a copy of a classification schedule; and
(3) a special note-book in which to record in detail the results of the survey.

The map or maps show the exchange area boundary line and the number of exchange lines existing in each D.P. area. The classification schedule tells the Contract Officer the value, expressed by means of a multiplying factor, he is to allow at 6, 11 and 21 years in respect of each class of tenancy he calculates will exist in each D.P. area at each of the three periods. Thus, as a very simple illustration, let us suppose that in some small town a solicitor's office is graded as O.1 (i.e., as a first-class office) and has at present one line; also let us suppose that the classification schedule shows for 0.1—

2.0 at 6 years,
3.0 „ 11 „ and
4.0 „ 21 „

Then this solicitor's office would appear as a unit in the forecast as having—

1 line now,
2 lines at the 6-year periods,
3 „ „ „ 11- „ „ and
4 „ „ „ 21 „ „

The duty of compiling the schedule falls on the Contract Manager, and before the survey is started it is his duty to point out to the Field Officer the principal characteristics of the area to be surveyed, its relation to adjacent areas, to go over the maps with him in detail and to visit the area with him to give practical examples of the application of the schedule.

The Field Officer is also armed with a copy of "Telephone Service Instruction No. 3/26 Development Studies—Block Surveys" and a copy of the little book, "Instructions for Officers Engaged on Field Work," by the aid of which—if he has the bent—he should be able to make success of his study work.

All the same, this work is far more difficult than is appreciated by anyone, no matter whom, who has not had the actual experience. In great cities the task is a stupendous one—in London, and I will deal later with the metropolitan ares, it is appalling—and even in scattered rural areas the difficulties are never small ones.

Let us take a few examples of areas which must be studied.

1. A certain pretty seaside place, with ancient associations, within 70 miles of London, easy run by car, some telephone development but no trains on Sunday. Sea-front owned for the most part by the railway company, small part privately and some part by the Crown. Dead hands of Railway Company and Crown Authorities have stifled the town's progress for years. Some signs in last few years of more progress. Will the now more go-ahead Southern Railway Company recognize what a gold mine the place could become, and will the use to which the Crown put its land prior to the war again change, as it has once already changed, or will the Crown now sell some or all of the ground? If so, when will these changes come. In any case, what will be the extent of the present building in progress?

2. That somewhat sleepy place up the river which has now become very accessible along the new road. Will that building now starting make the place a second Maidenhead or will it be a case of only a few new houses and will the old conditions continue? No local information of any value can be secured from any one.

3. That provincial town which once throve and now has starved for years on a trade connected with horses. Do those two prosperous works now turning out motor-car accessories mean that the old prosperity and more will return so that heavy telephone development will result?

4. That other provincial town. Will that bridge over the river be built after all these years of talk? If so, it will clear away that quarter-mile of slums, thus extending River Road and Watling Street and in the one small section transform 12 lines into 300 at least? Will good residences develop on all that open land to the west of Town Gates, or will Long Easton (in the Newtonhayes Exchange area) still attract from a residential point of view? Will the new bridge mean that Smiths will move their factory (they took over Brown's old building, which has never suited them) to North Side and so secure river frontage? If so, that means an end to North Side as far as residences are concerned. Will, when the new bridge is started, the railway extend by that loop at Hylton Junction? The extension was in the original scheme. If so, it will not be unreasonable to expect that the town will double in size, but to what extent will the 6- and 11-year periods be affected.?

Those are all building problems which, in the main, the Field Officer himself must settle, but the Contract Manager also has his difficulties when making up the classification schedule, e.g., the multiplying factors for the town referred to at 4 above would represent a hard nut to crack. Then, again, to what extent and how quickly will the telephone habit progress in Sleepy Slocum as compared with go-ahead Gumpton, 100 miles away—both much the same size? Will prosperity return to the potteries at Claybank? Will shipbuilding again become brisk at Stoneside? There were 50 slips there before the war and now there are only two 2,000-ton steamers building. Prosperity, of course, would mean higher factors.

Given a town of fair size the Field Officer (or Officers) on the survey may have a dozen or a hundred such problems as those referred to at 1 to 4 above to settle. And in this connexion the Tenancy system of making surveys has an outstanding advantage. In the old days, assuming that there was no question of any change in the existing class of property in a certain street, and assuming also that two Field Officers were engaged upon the study, the one taking the north side of the street might allow an average of one line per tenancy, whereas his colleague working on the south side, and with a less hopeful nature, might allow only 50% of lines to tenancies. Thus, two different values were often given to property of the same class in one street. Under present methods such a disaster is avoided.

I have already hinted that the development study arrangements in London are not quite on all fours with those in the Provinces. The three main differences are:—

(1) The L.T.S. has a special section of the Contract Branch, which deals with development studies only;
(2) The Field Officers are recruited from the clerical force; and
(3) While the telephone values of premises are assessed on well-defined lines, no classification schedule as known in the provinces is made use of.

All problems are the same, only more complex, and I will cite one such case only.

A development study has to be made, say, for the neighbourhood of Charing Cross. Now, will or will there not be a new Thames bridge in this locality, thus eliminating Charing Cross South-Eastern Railway Station and changing the face of the area? If so, when and what changes exactly will result? Meanwhile, the study has to be got on with and is expected to result in a reliable forecast May I say, "Some problem"?

And now let us hark back to the general subject.

Even when a direct-line forecast has been evolved, in many instances the work is still not complete. In all automatic cases the total figures require to be split up into several special headings, e.g.:—

Single direct lines.
Auxiliary lines.
Subscribers' coin box circuits.
Call office circuits (three classes).
Two-party lines.
Rural party lines.

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I think it will be admitted that the three grades of officers concerned in block survey work, viz., the Contract Manager, the Class I Officer who supervises the study, and the Class II Contract Officer (i.e., the Field Officer) have their work cut out.

We have, however, now reached a stage—satisfactory as far as it goes—where :—

(*a*) A standard, and I think sound, method of making development studies has been evolved.
(*b*) Those concerned now have well-defined rules available whereon they base their outlook.
(*c*) A special class of officer is available for the field work.

But are we sure that under present conditions every officer now engaged on Field duties is wholly qualified for his job and is the best man obtainable. I am more than doubtful on the point. It is true that many of the present field officers are all that one could desire, but I also fear that there are others and it seems to me that there should be no uncertainty here.

First let us remember that the result of a development study forms the ground work on which the Department commits itself to hundreds and often thousands of pounds of expenditure in connexion with land, buildings, and plant of all kinds. It appears, therefore, to me that this is a situation which requires that there should be no penny-wise-and-pound-foolish methods. Of these we have had enough in the past, when schemes costing huge sums have been launched on forecasts which later on were found to be wholly fallacious because, from motives of false economy staff unsuited to the requirements of the work were employed on the survey or perhaps someone had boggled at the cost of a proper block survey and so it was dispensed with.

Block surveys, I am glad to say, are to-day no longer dispensed with, but it is my view that the remuneration of Field Officers should be such as to attract in all circumstances the best men in the Class II Contract Officer grade. This is not so at present. Some men who would make excellent Field Officers prefer to remain on canvassing duties, as, with commission, they can make more money than the Field Officer can, even with the development allowance which is accorded to him. I am also of opinion that, even as there are operating schools so there should be a school—possibly an itinerant one—for Field Officers, presided over by a special officer of marked experience and ability.

In conclusion, just a word on the Headquarters work of examining and approving forecasts. We can, of course, only examine the figures (1) as to their face value and (2) in relation to other somewhat similar areas and criticise, amend or secure amendment of the forecast when necessary before we "O.K." it. While it is some time now since I made a test, when I last did so the result showed that the Headquarters criticism had resulted in 10% of the original forecasts being amended—and in an upward direction in most instances.

REVIEWS.

"*Electrical Engineering Economics.*" *By D. J. Bolton, B.Sc., A.M.I.E.E.* (*Published by Messrs. Chapman & Hall, Ltd. Price 21s. net.*)

This book, which is lucidly written, is intended to give to electrical engineers and students, first an account of elementary economics in connexion with capital and annual charges, sinking funds, &c., together with their application to certain engineering problems, and secondly, the solution of problems of economic choice of cables, motors, transformers, &c. This develops into a general consideration of the economic efficiencies of machines, both as regards competing makes, and the advantages to be gained by using larger machines than necessary, in spite of their higher cost, owing to their higher efficiency even at partial loads. The question of economically under-running such machines is followed by a discussion of the feasibility of making economies by the under- or over-running of electrical lamps, the altered efficiency being compared against initial costs and prices of current. The psychological effect of the altered brilliance of the filament must here be borne in mind.

The last portion of the book deals with electricity supply problems, tariffs and their adjustment for load, power and diversity factors.

Formulæ for dealing with the various problems indicated are developed, solutions are worked out in detail and in many cases illustrated by graphs.

It is necessary to bear in mind that quoted efficiencies are not always obtained, and that it is sometimes necessary to incur a higher running cost due to lower efficiency owing to difficulties in obtaining capital, but apart from these limitations the arguments advanced by the author appear sound, and are applicable to a larger field than dealt with here, so that the book should be welcome to engineers of all classes and not only to electrical engineers.

T. Mc.G.

"*Principles of Electric Power Transmission by Alternating Currents.*" *By H. Waddicor.* (*Chapman & Hall. Price 21s. net.*)

This book is primarily intended to supply the needs of students of engineering colleges. The practical side of the problem has, however, been kept well in view and it should therefore have a much wider sphere of usefulness. The earlier part of the book is devoted to the electrical characteristics of transmission lines and the mathematical treatment of transmission problems. Numerical examples are given in illustration.

The properties of materials used in overhead line construction are briefly reviewed, but there is little that deals with actual construction. Underground cables are dealt with in a similar manner and here again more attention is given to operating conditions than to construction.

The remainder of the book deals with protective devices for the prevention of dangerous currents and voltages, and a chapter is devoted to factors which produce pressure rises and the question of lightning strokes.

The book should serve as a useful introduction to the subject, but the student will need to supplement his reading largely in respect of practical detail.

H. C.

"*Automatic Telephony Simplified.*" *By C. W. Brown, A.M.I.E.E.* (*Sir Isaac Pitman & Sons, Ltd.* 168 *pp.* 6*s. net.*)

This work, which is described on the title page as "a book for telephone engineering officers, traffic officers and students who wish to acquire a sound knowledge of the principles and practice of automatic telephony as adopted by the British Post Office," admirably fulfils its purpose. It will need no recommendation to our readers, as its contents which appeared in a series of articles in our columns were so well appreciated that many of the issues containing them speedily ran out of print. The little book, which is fully illustrated, deals in successive chapters with the elements of switching, diagrams and circuits, auxiliary lines, multi-exchange working, and the arrangement of large exchange areas. Mr. Brown has a gift for imparting his information in lucid manner and we are sure our readers will welcome the publication of the articles in this cheap and handy form. As many of our readers are aware, Mr. Brown is a member of the Engineer-in-Chief's staff and is largely responsible for the special courses in Automatic Telephony which the Post Office has set up.

BROADCASTING THE GRAND NATIONAL IN AMERICA.

IN connexion with the Grand National Race on Mar. 30 this year a very interesting event from a telephone point of view took place. For the first time in the history of racing a running commentary on a race has been telephoned from this Country to America.

The Department at the request of the United Press of America made the necessary arrangements for establishing a telephone service from the roof of the Grand Stand at Aintree from which a representative of the United Press telephoned the race as it progressed direct to the office of the *Sun* newspaper at Baltimore, U.S.A., from whose office it was broadcast to the public, and the result of the race was actually known in America in advance of many people actually viewing the race.

The Americans expressed very decidedly their appreciation of the efficiency of the British Telephone Service and of the arrangements made and stated the experiment was a huge success.

The Liverpool staff were congratulated on the way the whole thing was carried through.

The conditions were by no means ideal. The installation at this end was more or less open. A breastplate transmitter and two head receivers were used by the transmitting officer sitting on the steps of the roof of the stand, and in order to exclude as far as possible the external noise (and with thousands of excited people around this was considerable) a rug was thrown over him, while a second person sat beside him holding up one corner and furnishing the other with the details of the race as it proceeded.

It was an achievement of which the Service may feel proud and puts the hall mark on the efficiency of the Transatlantic Telephone Service.

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PROGRESS OF THE TELEPHONE SYSTEM.

THE total number of telephone stations working at Feb. 29, 1928 was 1,617,563, an increase of 12,409 on the previous month's total. Gross new stations added during February numbered 21,368 and gross ceased stations 8,959.

The growth for the month is summarised below :—

	London.	Provinces.
Telephone Stations—		
Total at Feb. 29	573,231	1,044,332
Net increase for month	4,515	7,894
Residence Rate Subscribers—		
Total	131,080	209,456
Net increase	2,017	2,514
Call Office Stations (including Kiosks)—		
Total	5,151	18,664
Net increase	40*	143
Kiosks—		
Total	818	3,660
Net increase	46	108
Rural Party Line Stations—		
Total	—	10,189
Net increase	—	41
Rural Railway Stations connected with Exchange System—		
Total	—	865
Net increase	—	9

The number of inland trunk calls dealt with during January—the latest statistics available—was 8,355,868, an increase of 640,002, or 8.3% over the total for the corresponding month of the previous year. Outgoing international calls in January numbered 29,430 or 3,992 (15.7%) more than in January 1927.

Further progress was made during the month of March with the development of the local exchange system. New exchanges opened included the following :—

LONDON—Bishopsgate (automatic), Edgware, Ingrebourne, Terminus.

PROVINCES—Armley (automatic), Colchester (relief exchange), Windermere, Chatham (automatic); sub-exchanges, Gillingham, Rainham, Snodland, Strood,

and among the more important exchanges extended were :—

LONDON—East.

PROVINCES—Ainsdale, Anfield, Broadstairs, Burton-on-Trent, Cambuslang, Canterbury, Chapeltown (automatic), Deal, Dover, Dumbarton, Edgbaston, Egham, Grimsby (automatic), Heaton Moor, Kendal, Loughborough, Queen's Park (Glasgow), Wednesbury, Weybridge.

During the month the following additions to the main underground system were completed and brought into use :—

Wakefield—Sheffield.

Brighton—Uckfield } (Sections of the Brighton—Hastings
Brighton—Seaford } cable.)

while 99 new overhead trunk circuits were completed, and 119 additional circuits were provided by means of spare wires in underground cables.

*After allowing for closing of 27 call offices.

LEICESTER AUTOMATIC SCHEME.

A GLANCE at the prevailing feminine fashions suggests that Leicester, a city whose quarter of a million inhabitants are engaged largely in the manufacture of boots, shoes, hosiery and piece goods, ought to be a very prosperous town, and, if the demand for telephones can be taken as a reliable index, such is, indeed, the case.

Feb.10, 1928, is, therefore, likely to be regarded as a red-letter day in the history of that city—as soon as its misfortune in the fifth round of the "Cup" on that day is forgotten—for on that day Leicester was introduced to automatic telephony. The introduction was, however, only partial on the part of the automatic telephones, but as this was traceable to the prosperous state of trade in the city, and as the Post Office is hastening to complete the introduction, there is no doubt as to the cordiality of the ultimate relationship.

It is not proposed, however, in this article to describe the actual transfer of the Leicester exchanges to automatic working, but to give a brief resumé of the history of the Leicester scheme, which is, perhaps, a good example of the power of changing conditions, and the difficulties which must be surmounted before a completed scheme can be placed at the disposal of the public as a *fait accompli*.

In Leicester, the principal exchange was "Central," an old magneto exchange, rapidly approaching exhaustion in respect of both traffic and physical capacity and useful life, and therefore due for replacement. After

MANUAL SWITCHROOM, LEICESTER EXCHANGE.

an examination of the traffic characteristics, it was found that, owing to its high percentage of local and unit fee area traffic, the Leicester area was suitable for automatic working, and it was therefore decided to introduce this type of working in the new exchange. A survey of the area showed that considerable economy in line plant could be realised after 1931 by serving the south-eastern (Stoneygate) portion of the Central area by a satellite exchange. In addition, it was proposed to introduce automatic working at the exchanges lying within the local fee area; Syston, Western Park and Wigston being converted to automatic working simultaneously with Central, whilst Anstey, Aylestone, Birstall, Kirby Muxloe, Oadby and Thurnby are to be included in the scheme at various dates (up to 1938) as the full traffic capacity of the various exchanges is reached.

The number of lines originally anticipated in this area is given in the following table.

	(*Original Scheme.*) *Number of Lines to be Catered for.**		
	(1) *Initially.*		(2) *Ultimately.*
Leicester	7,400	8,600	14,500
Stoneygate	1,200		2,300
Anstey	—		300
Aylestone	—		600
Birstall	—		300
Kirby Muxloe	—		200
Oadby	—		400
Syston	200		300
Thurnby	—		300
Western Park	200		400
Wigston	300		500

The numbering scheme was therefore designed to cater for this number of lines, as large a number of lines as possible being provided for on a four-figure basis in order to minimise the difficulty which many subscribers find

* Including allowance for unavailable spares.

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in accommodating themselves to a five-figure system. The agreed numbering scheme was as follows :—

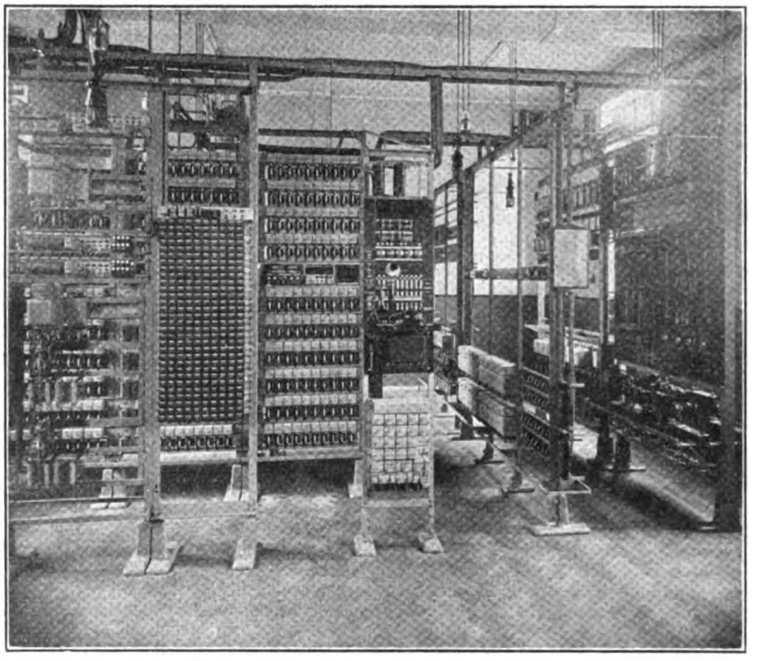
Multiple Numbers. 1,000's.		Exchange.	Initial Requirements.	Ultimate Requirements.	Maximum Numbers Available.
0	—	Manual Board.			
1	—	Spare (N.U.T.).			
2		Leicester.			
3		„			
4		„			
5	000–799	„			
58		„			
59		„			
60		„			
61	000–599	„	7,400		
61	600–999	„			
62		„			
63		„			
64		„			
65		„			
66		„			
67		„			
68	000–699	„		14,500	
68	700–999	„			
69		„			15,800
7	100–699	Stoneygate.			
77	000–599	„	1,200		
77	600–999	„			
78	000–699	„		2,300	
78	700–999	„			2,600
79		Oadby	—	400	1,000
80		Spare.			1,000
81		„			1,000
82		Anstey	—	300	1,000
83		Aylestone	—	600	1,000
84		Birstall	—	300	1,000
85		Kirby Muxloe	—	200	1,000
86		Syston	200	300	1,000
87		Thurnby	—	300	1,000
88		Western Park	200	400	1,000
89		Wigston	300	500	1,000
90	—	Phonograms.			
91	—	Enquiries.			
92	—	Service P.B.X.			
93	—	Rural Party Lines.			
94	—	Trunk Records.			
95	—	Telephone-Telegrams.			
96	—	Reversed Coin Box Calls.			
97	—	Spare.			
98	—	„			
99	—	Test Desk.			
		Totals ...	9,300	20,100	29,400

It will be seen that the margin for unexpected growth varies from 16% in the case of Leicester (assuming that one of the two spare levels—80 or 81—is appropriated) to 400% in the case of Kirby Muxloe.

The switching plant was then installed on the basis of this numbering scheme, but when it was approaching completion, it was found that the actual development was exceeding the estimate (doubtless due to the favourable trade conditions), and it became necessary to re-survey the forecasts for the whole of the automatic area. When this work was completed, it was found that development some 20% in excess of that anticipated initially and 40% ultimately, must now be catered for. This increase in the forecast in respect of the existing Central area was due, very largely, to increased growth anticipated in the outlying semi-residential portions of the area, and, as a consequence, it was found that considerable economies in line plant costs could be secured by opening additional satellite exchanges to serve the Belgrave, Evington and Humberstone portions of the area at various dates after the exhaustion of the plant already installed, but prior to 1938. The revised layout of the area is shown in figure 1 and the number of lines now to be catered for is given in the following table. Column 1 in this case shows the distribution of the lines between the various areas when the total number of lines for which the plant at Leicester itself was provided, is reached. The date at which this is expected to occur is now some two and a half years earlier than was previously anticipated.

	(Revised Scheme.) Number of Lines to be Catered for.* (1) Initially.	(2) Ultimately.
Leicester	6,100	17,700
Belgrave	500	2,000
Evington	8,600 400	1,600
Humberstone	500	1,900
Stoneygate	1,100	2,800
Anstey	—	400
Aylestone	—	1,900
Birstall	—	700
Kirby Muxloe	—	800
Oadby	—	800
Syston	300	700
Thurnby	—	500
Western Park	300	900
Wigston	300	700
Total ...	9,500	33,400

* Including unavailable spares.



GENERAL VIEW OF SWITCHROOM, WESTERN PARK EXCHANGE, LEICESTER.

When this new forecast became available, it was apparent that the existing numbering scheme was inadequate for the revised ultimate requirements, which necessitate the provision of 37 1,000 line levels as against 30 (29,400 numbers) available. (The number of lines to be catered for does not, of course, form the sole basis upon which a numbering scheme is designed, since the allocation of numbers to any particular exchange is limited by the trunking requirements. For example, it would not be a practical proposition to allocate, say, 700 numbers on a particular level to Syston, 700 on another level to Wigston, and then allocate the balance on these two levels to Thurnby.) It was, therefore, clear that the numbering scheme would have to be recast and a review of the case indicated that the introduction of a complete five-figure numbering scheme (70 levels—70,000 numbers) was desirable. This would, however, entail extensive modifications to the existing plant at some stage or other, and three schemes for carrying out this work presented themselves, viz. :—

(1) Postpone opening the Leicester exchange until the plant could be rearranged.
(2) Proceed with the original scheme, and rearrange the numbers and plant afterwards.
(3) Open as early as possible with such plant as would be undisturbed by the rearrangement, and convert the rest of plant afterwards.

As regards No. 1, the amount of work involved in rearranging the plant was clearly considerable and would probably delay the opening date of the new exchange about six months. What effect would this delay have upon the public service ? Every possible means of extending the capacity of the existing Central Exchange had already been explored (including the

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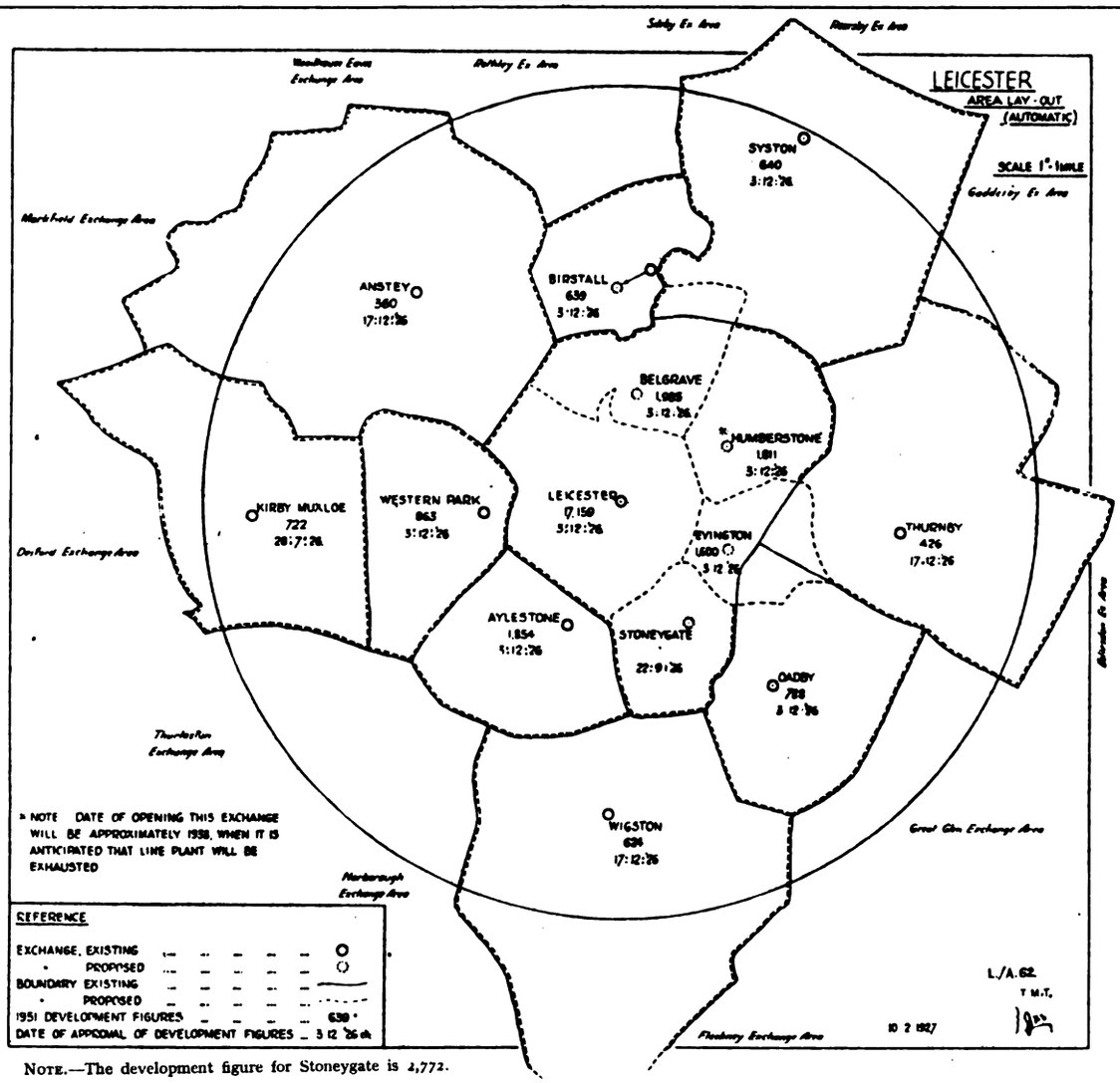

NOTE.—The development figure for Stoneygate is 2,772.

LEICESTER AREA LAY-OUT (AUTOMATIC).

feasibility of a relief exchange), but it had been found impossible to secure any increase upon the 6,400 lines already catered for in that exchange. In addition, canvassing in the Central area had been suspended since October, 1925, but despite this precaution new orders were being received at the rate of 300 per annum, which meant that 6,400 lines would be working some nine months or so before the modified plant could be made available. In the circumstances, therefore, to close the area against all development for a period of probably nine months was entirely out of the question.

No. 2. Now, if the numbering scheme were modified after the opening date, even with the most favourable trunking scheme (which did not provide for such a large margin at the ultimate date as was deemed desirable), it would be necessary to change the number of nearly 3,000 subscribers during the initial 10 years. Of these, 600 would have to change their number twice within 5 years and 1,000 twice within ten years, i.e., upon their transfer to the automatic exchange in the first place and, again, either when the four-figure numbers were converted to five, or, in the case of subscribers proper to the new exchange areas, upon the opening of the satellite exchanges.

In these circumstances, it was clearly desirable to modify the trunking, prior to the opening date, to a five-figure scheme which would permit of the opening of the new satellite exchanges without involving any subscribers in a change of number. The desirability of this course was emphasized by the fact that about 80% of the number changes involved would be changes from four to five figures, a condition which means that a caller, dialling the discarded four-figure number, would be left stranded at an intermediate switching point in such a position that his call could not be intercepted or diverted to the manual board, or the appropriate tone signal passed to him.

No. 3 alternative was therefore adopted and was actually introduced on Feb. 18. last. This scheme involves the opening of that portion of the plant which had already been installed on a five-figure basis (i.e., numbers 58,000-61,499) as a relief exchange to Central, whilst the rest of the plant is being modified to suit the revised requirements. In the breathing space thus obtained, it is possible to introduce a better numbering scheme than would be possible if alternative No. 2 were adopted, and it is now proposed to meet these new requirements by a complete five-figure numbering scheme (except for a few numbers on the 5 and 7 levels, which cannot easily be re-wired) providing for 56,400 lines on 57 levels at the ultimate date, so arranged that, although Belgrave, Evington, Humberstone and Stoneygate will not come into service as separate entities for several years, no number changes need be involved when this does take place, provided subscribers in those areas are allocated numbers within the correct range at the outset.

About 1,100 subscribers were converted to automatic working at the advance transfer and the broad principles governing the choice of these lines are worthy of closer explanation. First, as regards their location; since, with the new numbering scheme, it is proposed to serve some of the Leicester area, and the whole of the Belgrave area, from numbers in the range 58,000 to 61,499, it is clear that the subscribers transferred on advance must be restricted to those in these two areas. Secondly, as regards the total number; here there are certain general considerations, more or less common to all relief exchange schemes, to be considered first. The opening of a relief exchange has the effect of increasing the value of the originating traffic at the relieved exchange in respect of calls which were previously completed in the multiple, but which now have to be passed over a junction to the relief exchange, and of increasing the incoming traffic by virtue of the fact that certain calls which were previously local calls are now originated at the relief exchange and are completed over incoming junctions from the latter. If the number of lines on the relief exchange is very small, it has to depend upon the relieved exchange for all incoming and outgoing junction traffic, which means that there is no decrease in the incoming traffic from other exchanges to the latter (certain traffic simply becoming "through" instead of "terminating"), whilst there is an increase in the total incoming traffic by an amount equal to the originating junction and trunk traffic at the relief exchange, which is either terminated at or circulated via the relieved exchange. Thus the traffic capacity of this exchange is reduced every time a line is connected to the relief exchange.

It is, therefore, necessary to transfer a fairly large number of subscribers from a relieved to a relief exchange in order to relieve the former of a margin of traffic sufficient to counter-balance the incoming traffic from the latter, and, at the same time, to justify as many direct routes to the latter as possible.

This, of course, means relieving the "A" positions at the expense of the "B," so far as the relieved exchange is concerned, and it is fairly obvious that one limit to the number of lines that can be transferred to the relief exchange is determined by the number of "B" positions that are available for handling the inter-exchange traffic.

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In the case under review, two keysender order wire "B" positions were installed in the automatic exchange as part of the original equipment, and as they are not otherwise required during the transition period, they are available for the accommodation of the transfer circuits from Central. In addition, two jack-ended "B" positions are available for the same purpose. At Central, the similarity of the cord circuits on the "A" and J.E. "B" positions means that any positions not required as "A" positions can be used as J.E. "B" positions, if necessary.

Thus, the limit in this respect is clearly fixed; any increase in the number of the positions on the auto-manual board solely for the comparatively short period before the main transfer is not considered permissible. Owing to its heavy expense, dialling out to or dialling in from Central is also out of the question.

But, there is yet another limiting factor to the number of subscribers that can be served from the relief exchange in the special circumstances at Leicester, since the average number of subscribers and traffic units per preselector group and final selector unit of the plant brought into use at the advance transfer must not exceed the average figure per group or unit for the whole exchange when the transfer is complete. In the Leicester case, this particular feature is the limiting factor to the number of lines which can be served from the relief exchange, although the limit imposed by the traffic-carrying capacity of the "B" positions on the auto-manual board is only slightly in excess of this factor.

On this basis, about 1,000 working subscribers were found to fulfil the necessary requirements as regards locality whilst, at the same time, keeping the traffic, &c., within the limits indicated, and this number, together with about 100 new lines accepted between the agreement of the scheme and the advance transfer, were transferred to the relief exchange upon its opening. Further growth will have to be met on Central, as the limiting number of subscribers on the relief exchange has now been reached.

The opening of a relief exchange in Leicester was considerably facilitated by several favourable factors. In the first place numbers in the range 5,000 to 6,499 at central have no multiple appearance over the "A" positions, and those in the range 5,500 to 6,499 do not appear over the "B" positions, access to subscribers with these numbers being obtained via order wires to local transfer positions. Therefore, it is clear that if as large a proportion as possible of the subscribers transferred to the relief exchange are taken from among those to whom the "A" telephonist had previously to gain access over a junction, the increase in the originating junction traffic at Central would be reduced to a minimum, and as this traffic can still be completed over an order wire (to the keysender B positions at the auto-manual board) the increase in the call value on the "A" positions at Central would also be reduced to a minimum. In actual practice, it was found possible to restrict the subscribers who were transferred from Central to the automatic plant to those with a partial multiple appearance and thus, one of the main objections to the opening of a relief exchange was automatically overcome. Further, owing to the fact that a through call completed via a signal junction has a smaller call value than one completed via an order wire junction, it had been possible to secure a saving on the "B" positions at Central. This has been achieved by completing the incoming traffic routed through Central to the subscribers transferred in advance over a signal junction, instead of an order wire as obtained when these lines were working on Central. A separate group of circuits to a jack-ended "B" position on the auto-manual board has been provided for this purpose.

The necessity for providing direct routes to a relief exchange so far as possible has already been demonstrated, but this is not a very easy matter in an exchange with only about 1,000 subscribers whose predominating community of interest is purely local. But here the position was helped very considerably by the decision to close the old (Post Office) Trunk Exchange simultaneously with the advance transfer of the automatic exchange and to bring the trunk positions on the auto-manual board into use at the outset. Leicester, as a subsidiary zone centre in the Birmingham zone, is the trunk centre for some 60 exchanges, and, as a consequence, it was possible to justify direct circuits (common to both the trunk and local sides of the automatic exchange) on a number of routes by routing both the trunk and junction traffic over them.

As a result, the net reduction in the traffic capacity of Central is very much less than is normally the case when a relief exchange is opened, despite the conversion of two or three routes from a delay basis to a no-delay basis upon the closing of the old Trunk Exchange, the traffic on these routes now being controlled by the "A" telephonists, instead of in the Trunk Exchange.

Yet another factor favouring the scheme was the fact that about 700 of the 1,000 subscribers involved in the proposed advance transfer were already served by cables which were led through the main frame on the new exchange, thus assuring an adequate supply of cable pairs between the two exchanges for the transfer junctions, &c.

From the subscriber's point of view, the arrangements are simple. The main automatic exchange is to be known as Leicester, subscribers working on Belgrave, Evington, Humberstone and Stoneygate taking the name, index numbers and trunk charges of the main exchange, whilst subscribers on the other sub-exchanges retain the name of their manual exchange. Since the existing main exchange is known as Leicester Central (or simply Central so far as the surrounding district is concerned), there is no need to differentiate further between the two exchanges so far as the public is concerned. Possible clashing between the two exchanges is further guarded against by virtue of the fact that the working Leicester numbers are all five-digit numbers, whilst those on Central are four-digit. For this reason, the few four-digit numbers on the five-level which are not to be changed and which have a counterpart on Central, are excluded from the portion of the automatic plant which is being used as a relief exchange. And as a further precaution, all Central subscribers bearing numbers coinciding with the Service Codes used by the public (i.e., 90, 91, 92, &c.) have had their numbers changed to ones which will not suffer a further change (i.e., in the 5,000 range) or have been included in the advance transfer.

Thus, the remaining Central subscribers simply ask for Leicester . . . to obtain a number on the automatic exchange, whilst in the case of traffic in the reverse direction, the automatic subscribers dial "0" for Central (as for all other exchanges obtained via the manual board on a junction basis) whence they are extended to Central.

The transfer itself is of comparatively minor interest. The three sub-exchanges to be included in the scheme at the outset (viz.: Syston, Western Park and Wigston) were brought into service simultaneously with the opening of the main exchange. The only special arrangements in connexion with these exchanges necessitated by the partial transfer of the main exchange, were the provision of additional lines to and from the manual board for the higher percentage of manual board traffic which must be catered for until such time as automatic working is extended to the whole of the area. For this purpose, it was also necessary to equip a spare jack-ended "B" position on the auto-manual board two or three years earlier than would otherwise have been necessary, the signal junctions outgoing from Central to these exchanges under manual conditions being diverted from their distant terminations to this position, whence incoming calls are dialled in. Subscribers in Leicester, Syston, Western Park and Wigston can dial each other direct, and since these exchanges were dependent upon Central when working manually, their conversion to automatic working did not have any appreciable effect on the traffic capacity of that exchange.

The pre-transfer work consisted primarily of the following:—

(1) Segregation of the subscribers to be included in the advance transfer on change over strips at the two exchanges.
(2) Segregation of the junctions from Central to Syston, Western Park and Wigston.
(3) The concentration of subscribers to be included in the advance transfer on the four "A" positions which were scheduled for conversion to "B" after the transfer and the provision of jack-ended junction equipments on them.

In the automatic exchange, the only changes required specifically for the advance transfer were the equipment of the spare jack-ended "B" position (already indicated) and an increase in the number of "0" lines to cater for the higher percentage of manual board traffic which is to be expected during the transition period between the advance and the main transfers.

One incidental difficulty arose out of the prosperous state of trade in Leicester, viz.: the difficulty in obtaining locally the additional telephonists required to cater for the additional manually handled traffic during the transition period, and it was found necessary to transfer redundant temporary telephonists from Nottingham (which had just been converted to automatic working) for this purpose.

The actual transfer took place with clockwork-like precision.

During the week preceding the transfer, the various trunk circuits were transferred from the old Trunk Exchange to the new trunk suite, a certain number of circuits being transferred each day together with a corresponding proportion of the lines used for the completion of calls to or via Central. At midweek, Trunk Records was transferred to its new home, and by Saturday mid-day, the whole of the trunk circuits, trunk junction circuits and trunk record circuits were withdrawn from the old Trunk Exchange, the circuits to Coventry, Rugby, Burton-on-Trent and Nuneaton being transferred to Central and a full no-delay service introduced on these routes.

As soon as the busy hour on Saturday was passed and the traffic had assumed its Saturday afternoon slackness, the diversion of the local transfer circuits to the "B" positions at the auto-manual board, the diversion of the outgoing circuits to the three sub-exchanges, and the provision of the circuits from the auto-manual board to Central was commenced. A nucleus of circuits was thus available when the transfer was completed at midnight, the remainder being brought into use on Sunday, so that the whole of the new arrangements were ready for the busy hour on Monday.

As the zero hour on Saturday approached, all connexions on the lines to be transferred were cleared down and at midnight the change-over plugs were inserted, and the lines to be transferred, which were already routed via the automatic exchange, were cut at the latter point. On the pairs thus thrown spare, the lines to be transferred, which were already routed via Central, were extended to the automatic exchange, the relative exchange equipment at Central being disconnected by the withdrawal of the heat coils. The wooden wedges in the protector springs on the main frame at the automatic exchanges were then withdrawn, and the subscribers' lines were "through."

Now the way is clear for the modification of the four-figure portion of the plant without interfering with the public service, whilst the additional capacity secured at Central will be ample for some two years' growth at the present rate of development.

G. P.
W. K. M.

NOTE.—The photographs are published through the courtesy of Mr. Grinsted, of Messrs. Siemens, Ltd. (the firm responsible for the installation, which is of their well-known No. 16 type). The photograph of the Western Park Exchange gives a good idea of a modern, self-contained automatic satellite exchange.

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CORRESPONDENCE.

ADVERTISING THE TELEPHONE SERVICE.

TO THE EDITOR OF "THE TELEGRAPH AND TELEPHONE JOURNAL."

Sir,—With reference to advertising the Telephone Service, the following points may be of interest:—

The advertising matter now issued practically all relates to the utility and cost of the Service. The public are only told what the Service is to them, but not how it is provided. I think the time has now arrived when the public can be profitably educated as to what is done to provide the Service.

For instance, a desiccator at work in the streets is quite a common sight; but what is generally known about it? What it is, what it is doing and why. Publication of this information would make every desiccator a real live advertisement because pedestrians would take an interest in it, and think about it as they pass along.

The common sight, too, of a jointer's tent on the pavement could be made equally fascinating if the passers by knew what the engineers are doing inside.

Even telephone poles could be brought into the scheme. Where they come from. How chemically treated, &c.

What a wealth of interesting matter, too, could be issued regarding the best frames, dynamos, accumulators and switchboards.

Our engineers tell me that the apparatus now installed for the automatic service is so fascinating even to them, and uncanny, that one is almost led to imagine that it thinks for itself. How much more so, then, could the public be enchanted by the issue of advertising media relating to this latest development in telephony.

My suggestion is that a series of brochures should be issued setting out these matters in a clear comprehensible manner, and put in such a way as to make it very interesting reading to an intelligent mind.

They could be numbered 1, 2, 3 and so on, and a note put at the end of each stating that a further pamphlet will follow shortly on such and such a subject.

The idea of such a scheme is to lead the public up to a point where they will say "Yes" on their own account, when they realise the huge amount of work, material, thought and technical intelligence required and brought to bear at the other end of the wire.

I should also like to see a clause inserted in the general conditions of the agreement making it imperative upon all new subscribers to take the earliest opportunity to make an appointment with a view to visiting their own exchange. I feel that a great number of subscribers complaints are due to this lack of knowledge.

I also think that it would be a huge benefit all round if a subject, "How to use the telephone, and what happens" could be introduced into the elementary schools of the country and to be taught to those about to leave. This, I think, will be quite necessary when the automatic service is in full swing.

In conclusion, why not bring the residents in suburban areas into our confidence and show them the "layout" of the development schemes. Tell them what is being done and will be done on their behalf. I feel that if this is done many at least would feel it incumbent upon themselves to do their best in making this huge business a success by becoming subscribers.

F. T. HOOD,
Contract Officer.

RETIREMENT OF MR. BEAK.

A LARGE and representative gathering assembled in the Dining Room of the Holloway Factory (Post Office Stores Department) on the evening of Mar. 30 to bid farewell to Mr. F. G. Beak, Staff Officer, upon his retirement.

A musical entertainment and tea were held in honour of the occasion and Mrs. Beak was present as the guest of the staff. Mr. C. E. Fenton, M.B.E., Senior Staff Officer, presided, and in his opening remarks paid a glowing tribute to the ability and zeal of his departing colleague. The presentation, which took the form of a Westminster Chime Clock, was made by Mr. H. Sparkes, C.B.E., Controller of the Department, who also handed to Mrs. Beak a Waltham Wristlet Watch and Bangle, coupling his action with an extremely interesting survey of Mr. Beak's official career.

Mr. Beak has been closely connected with the Telephones and Telegraphs for many years, his association with the Factories Section of the Post Office dating back to 1885, and the esteem in which he has been held was clearly manifested in the eloquent testimony paid by speakers from the various Departments.

In reply Mr. Beak thanked all those concerned for the loyal assistance given over a long period, and assured the gathering that the evening's event had surrounded his departure with an atmosphere of lasting joy.

A. M.

RETIREMENT OF MR. A. C. HALEY.

THE Telephone Service lost another old and valued official on March 31, 1928, when Mr. A. C. Haley, District Manager of the North Midland District, retired after 44 years' service. Mr. Haley commenced his service with the National Telephone Company at Bradford in 1884, as an Inspector. He was promoted to District Manager of the West London District in 1896. He took control of the newly-formed North Midland District in August, 1925.

A Whist Drive and Dance was held at the Welbeck Hotel, Nottingham, on March 27, 1928, in order to provide a suitable setting for the leave taking and presentation to Mr. Haley.

Amongst the guests present were: the Surveyor, Mr. E. J. Gayes; the Assistant Surveyor, Mr. R. J. I. Measham; and the Head Postmaster of Nottingham, Mr. G. P. Cooper. The presentation ceremony took place at the end of the Whist Drive, the Chair being occupied by Mr. J. L. Magrath, Contract Manager, who gave a very interesting resumé of Mr. Haley's career and voiced the sincere regret with which the Supervising Staff viewed the departure of Mr. Haley. Mr. Magrath stated that the intention had been for the gift to be a dual one to both Mr. and Mrs. Haley. This object had been achieved by the present selected, viz.: several articles of antique furniture, with which Mr. and Mrs. Haley were equally charmed.

Mr. Fitzpatrick, Clerical Officer, paid tribute to the kindly courtesy with which Mr. Haley had always received staff representations, and mentioned the happy relations which existed between all grades in the North Midland Telephone District. Mr. Cooper, the Head Postmaster of Nottingham, speaking on behalf of the Head Postmasters and Postmasters throughout the District, referred to the universal esteem in which Mr. Haley was held by the Postmasters. He read several eulogistic letters from Head Postmasters and Postmasters unable to be present.

Mr. Gayes, the Surveyor, in a delightful speech, paid tribute to the untiring zeal with which Mr. Haley had worked for the good of the Telephone Service, and expressed satisfaction at the excellent relations which existed between the District Manager and every section of the staff. Miss Lees, Higher Clerical Officer, in a happily-phrased speech, made the presentation, which took the form of a cheque to cover the cost of the selected articles. Mr. Haley was deeply affected by the tributes paid to him and the feeling of enthusiastic goodwill manifested. In a few well-chosen words he thanked all concerned.

After the ceremony, in the words of the genial Chairman, the slogan was "On with the Dance." It was voted by all to be one of the most successful and enjoyable function held in the District. Mr. F. E. Collins (Staff Officer) undertook the duties of Host with the assistance of a representative committee comprising Messrs. Carter, Magrath, Breward, Fitzpatrick, Robinson and Miss Scriven.

PRESENTATIONS AT YORK.

ON the occasion of his transfer to the North Midland District on April 2, Mr. D. J. Barnes, who has been District Manager of the York District for the past eight years, was presented by the York staff with a handsome mahogany card table and oriental brass bowl and stand. At the same time, Mr. A. Kemp, Assistant Traffic Superintendent, who has been transferred to Manchester, was made the recipient of a Rolex wristlet watch suitably inscribed and a leather tennis racket case. Both officers were held in high esteem by their colleagues and they carry with them to their new spheres the good wishes of all.

PRESENTATION TO MR. GEO. EDWARD.

AT Reading Traffic Office, Saturday, March 31, 1928, on the eve of his departure from Reading to take up duties as District Manager of York District, Mr. Geo. Edward, recently promoted from the rank of Traffic Superintendent, Class I, was the recipient of a handsome cabinet gramophone, with records and a pair of antique vases, the former being subscribed for by his colleagues and staff of the Reading Exchange, the latter by a few friends on the postal side. The presentation on behalf of the staff was made by Mr. C. F. Moorhouse, District Manager, who referred in warm appreciative terms of Mr. Edward's good work in the Reading District. Similar expressions of goodwill were tendered on behalf of the respective staffs by Messrs. Young, Parsons and Frame, which were aptly and feelingly responded to by Mr. Edward. He left Reading District on March 31, 1928, to take up his new duties at York on April 2, 1928. His numerous friends and colleagues in the Reading District wish him every success in the new sphere of his activities.

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GLASGOW TELEPHONE NOTES.

MR. A. E. COOMBS, District Manager, Mr. E. J. Johnson, Traffic Supt., Miss A. L. Wood and Miss J. S. Drennan, Supervisors (Class II), with the assistance of several members of the Traffic and Exchange staffs, have just finished a remarkably busy winter season. Not satisfied with the work involved in connexion with the Exchange staffs, these ladies and gentlemen carried through a series of public official lectures on "The Service from Within."

With the aid of a working model switchboard, loaned by Headquarters, meetings have been held in different parts of the District. The principles of the Service, including a short description of the general organisation of the Post Office, were first outlined by Mr. Coombs or Mr. Johnson, after which the operation of local, junction and trunk calls, as between calling and called subscriber via the telephonists, was demonstrated by actual transactions, telephones being fitted in different parts of the hall for the purpose. After the demonstration, the meeting was thrown open for questions for criticisms.

It was my pleasure and privilege to attend some of these gatherings, which included subscribers, call office users, and potential subscribers; indeed, new orders for telephones were actually signed after some of the meetings. If one may judge from the reception accorded to the lecture and demonstration, and the delightfully charming atmosphere created by the official party, then much service good should result. I am informed that over 30 of these meetings took place, and that they were attended by more than 4,000 citizens of Glasgow and environs.

No doubt further particulars will be forthcoming in due course, and I will not therefore anticipate anything which may appear later. I must, however, pass on the comment of a lady which she made at the close of one of the lectures. "That demonstration," the lady said, "carefully considered, was a study in enunciation, tense and punctuation, as well as good advice to telephone users."

On leaving the Service to go to Toronto, Mrs. I. W. Bannerman, late of the Govan Exchange, was presented with a suitcase and several personal gifts by her colleagues as a token of their esteem and best wishes for her future happiness and prosperity.

We offer our congratulations to Miss M. K. A. Lumsden on her promotion to the position of Assistant Supervisor, Class II.

The many friends of Mr. R. Kirkwood, Clerical Officer, District Manager's Office, Glasgow, will regret to hear of his retirement from the Service for health reasons. His former colleagues, to mark the occasion, took the opportunity of sending him a token of their esteem with an expression of their wishes that he might soon be restored to health. In a letter of reply Mr. Kirkwood trusted that he might soon be able to renew acquaintance with his old friends.

Correction.—It was erroneously stated in the notes for last month that Mr. A. M. Mellish was the accompanist for the concert promoted by the Douglas Exchange staffs. This should have read: "Mr. Mellish was M.C. for the Whist Drive and Miss McLeod the accompanist for the Concert." The winner of the Ladies First Prize was Miss F. A. Brough. Miss D. Muller should be included among the artistes.

Golf.—One of the happiest moments of a Scotsman's life: When, all square and one to play, the driver meets the ball with a clear, sweet kiss, and he knows he has got in a real beauty when it was really needed.

Arrangements have been made by the telephone members of the Bell Golf Club to hold their annual knock-out competition, the first round to be played by May 5.

Specialisation v. Rotation.

Specialisation.—"The power of a man increases steadily by continuance in one direction. He becomes acquainted with the resistances, and with his own tools; increases his skill and strength, and learns the favourable moments and favourable accidents."—(Emerson.)

"No man is expected to be a jack-of-all-trades, but a master of one."—(*Telegraph and Telephone Journal.*)

Rotation.—"No, no; regular rotation, as Jack Ketch said w'en he tied the men up."—(Sam Weller.)

"Rotation is the law of nature."—(Emerson again.)

As we go to press news reaches us of the promotion of Mr. J. S. Wallace, ex Third-Class Clerk, to the position of Higher Clerical Officer in the District Manager's Office, Newcastle. As time is short we are forced to limit ourselves at the moment to briefly congratulating Mr. Wallace upon his appointment and our Newcastle confrères upon the acquisition of an officer who possesses every qualification for his new post. "J. L."

Directory Call.

Subscriber with small voice: "Give me Auntie Nellie's number at Dunoon."

Operator (in helpful way): "What is your Auntie Nellie's name? I must know that to find the number."

Subscriber: "It's not my aunt! It's a garage—Antonelli, Dunoon." (Collapse of operator.)

"Disconnected."

It was reported one day that a caller in one of the kiosks had requested a reconnexion as she had been cut off and the operator did not recollect having made such a connexion as was stated. The same thing had happened on the two preceding mornings and the subscriber had been given the benefit of the doubt and the number asked: but the operator felt that further enquiry was necessary this day.

Upon investigation it was found that the caller had been asked, three mornings previous to this, to take an extension of time, which she refused, and was therefore disconnected. When the circumstances were explained she cutely answered: "It says in the front of the telephone directory, 'if you are cut off during conversation you should ask the operator for a reconnexion with the number required.'"

And her accent was not that of Aberdeen!

M. L. TULLOCH.

LIVERPOOL TELEPHONE NOTES.

WE have to record the retirement of Miss G. Johnson, Supervisor, Trunk Exchange, after 46 years' service. The Department has lost an officer of remarkable force of character, and one who held the respect of all with whom she came into contact. Miss Johnson exercised a wonderful control over her staff, and her interest in them extended far beyond their official duties.

Considerable appreciation of Miss Johnson's capabilities was expressed in the local press and numerous gifts marked the occasion of her retirement.

As was natural, the severance from a life-long occupation was not lightly borne, but knowing her great activity of both mind and muscle, we feel sure that her future moments will be as fully occupied as her past. We wish her the very best of health.

Mr. H. Lee, Clerical Officer, Contracts, has left us to take up duty in the Engineer's Office, Brighton. He was presented with a small token of remembrance by the staff, whose best wishes go with him.

A welcome is offered to Mr. G. Johnson, Asst. Traffic Superintendent, who has returned to us after a long sojourn in Manchester, and to Mr. P. Pealing, Clerical Officer, who has taken the place of Mr. H. Lee.

A District Office Social was held on April 13 at the British Legion Rooms, Post Office Branch. There was a large attendance and the manifest enjoyment of those present was a tribute to the ability of the organisers, to whom thanks are due for the work entailed in the preparation of an excellent programme and refreshments. Such functions are very helpful in bringing the staff together outside the official atmosphere. We would like to see a regular winter programme inaugurated. C. H.

TELEPHONE AND TELEGRAPH SOCIETY OF LONDON.

AT the annual general meeting of this Society, held on April 16, prior to the reading of Mr. H. J. Maclure's paper, which we reprint in another column, Mr. L. Simon, the Chairman, subsequent to the election of officers and Committee, said when commenting on the successful and interesting session, that the Committee had been considering what steps could be taken still further to stimulate interest in the Society and its proceedings and to increase the membership. A resolution incorporating various suggestions to this end was approved.

Sir William Mitchell-Thomson, Bt., K.B.E., M.P., Postmaster-General, was re-appointed President. The Vice-Presidents were re-appointed, and Mr. E. Raven, C.B., Mr. W. T. Leech, C.B., and Mr. L. Simon were appointed additional Vice-Presidents; and Mr. J. Stuart Jones, M.B.E., was appointed Chairman for the 1928-29 Session. It is interesting to recall that the latter was Honorary Secretary of the Society from 1919 to 1923.

In recognition of the services which they had rendered to the Society, Messrs. J. J. Tyrrell, T. A. Prout, R. Greenstreet, A. W. Edwards, W. G. Wood, and W. A. Mattinson, were made Honorary Life Members.

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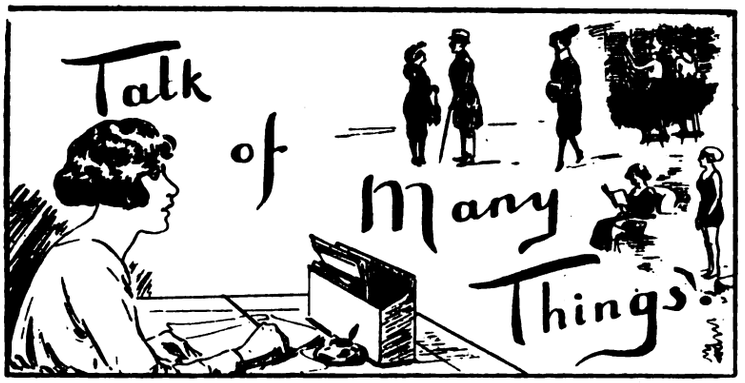
WE TELEPHONISTS



The Busy Hour.

WE are very busy in the garden at present. When I say "we" I mean the birds, Bindle, and myself—not forgetting Simon the snail. Just what Simon does I do not know, but he takes a very long time to do it. He is now a third of the way up the garden path, having heard the rumour last spring that early in 1929 a crocus would positively appear at the top of the garden. He gave me to understand as he passed me at top speed that it would not be cricket if I moved that crocus. He had been put to considerable inconvenience and expense, he said, in undertaking the journey. He had stored the furniture and packed his wife and children off to stay with grandma, and he did not want to find after all this that he had reached a crocus that wasn't there. Moreover, he would never have embarked upon such a long journey through a garden so infested with birds had he not had a very special reason. It appears that his wife had expressed an ardent desire for a piece of that crocus and, since when she wanted anything she wanted it very badly, Simon must needs sally forth to satisfy her demand. "But, you know" he said, sadly, "by the time I get back in 1930 or 1931 she will have forgotten all about it and will nag me for stopping out late. So if you'll remove your feet I'll be getting along. G'morning." Well, after that, of course, I shall not have the heart to disturb the crocus, but won't he rampage if the thing doesn't come up next year! Will he run amok with the light of murder in his eyes? If so had I not better meet him with the plant half way, or pick him up and carry him to it? Robert, the thrush, however, has promised to settle the question for me, but he was afraid that he could not tell me whether Simon's wife would wear widow's weeds or whether there is an orphanage for fatherless snails.

But as I was saying, we are very busy in the garden at present. Henrietta, the blue tit, is pecking at the swinging cocoanut, and James, her spouse, is waiting his turn patiently. Uncle Ben, the great tit, is hovering round a piece of fat. He is a portly old gentleman and has the appearance of being "something in the City." He is bluff and hearty and is often heard to remark, "Damme, Sir—What What—the country is going to the cats." George and Eliza with a host of their sparrow friends are scrapping over the bits of bread on the lawn. They were waiting on the fence for me this morning and hopped down perkily when I appeared. They intimated that they would be obliged if I would provide mashed potato for lunch, and would I mind being more punctual with meals because *they* had plenty of work to do if *I* hadn't. A robin sniggered at their pert remarks, but Richard and Amy, the finches, were obviously embarrassed by this exhibition of bad manners. They are ever so nice, not at all proud, and it is quite a privilege to have them as tenants on the estate. Herbert and Caroline, the starlings, have just jostled into the crowd. They are a fussy pair and have a very consequential manner. They spend so much of their time talking scandal, chattering about their domestic affairs and imitating their neighbours, that I wonder they find time to eat. Compared with them William the blackbird is a model of deportment. He is standing on the lawn now, sleek and motionless, with his head on one side. He thinks he heard the early worm yawning. Yes, sure enough; a quick run, a pounce, and out comes Winnie like half a yard of spaghetti.

Thus I lounge against the fence, smoking dreamily. Bindle, the hound, is lounging at my feet and together we watch the work proceeding in the garden. Bindle is not quite sure that there ought to be so many birds about and he is a little resentful that they should be taking the hair I have combed from his coat to line their nests. He would like to chase them just for the pleasure of seeing them rise, but he answers my arresting glance with a smile in his eyes and wag of his tail. I think he is rather pleased about the fate of Winnie because he always blames the worms if he can't find the bone he has buried. Bones and their treatment form the subject of our one and only difference of opinion. I maintain that bones ought not to be buried in the garden. He maintains that a bone is no good until it has been buried, and that with all due respect he cannot understand my aversion. To clinch his argument he refers me to Mr. Chesterton's song of Quoodle.

Just then the voice of Camou floats from the house and asks Percy whether he does not think that he might tidy the front garden, and isn't it about time he cut the grass and rolled the paths, and isn't he ever going to put up that trellis and tie up the ramblers, and has he forgotten to chop the firewood, and what about that heap of rubbish to be burned, and does he know that the summer-house leaks, and when will he——

Oh yes, we are very busy in the garden at present, aren't we, Bindle!

PERCY FLAGE.

For the benefit of those of our readers who were not present at the Telephone Play, we print the following clever verses contributed by C. A. S. and used in the opening scene. Our contributor disclaims responsibility for the last four lines!

The Trumpeter.

(Revised Version.)

"Holborn Sub.—what are you dialling now?
Is it a call you're seeking?
You seem to be in a quandary—
'Tis the supervisor speaking."
"Oh, merciful powers, I've dialled for hours—
And waited in vain for my number,
But now I've got you, will you see me through?
I'm trying to call a plumber!"

"Holborn Sub.—what are you dialling now?
This is the Super speaking,"
"I can't get a call on this line at all—
Just a lot of bubbling and squeaking!
It's getting so bad it's driving me mad,
For my business is all going under—
And there isn't a doubt that my mind will give out
When I think of the charge—no wonder!"

"Holborn Sub.—what are you dialling now?"
"Is that the Super speaking?
I've smashed my disc and I'll face the risk—
'Tis revenge I now am seeking!
I'm here all alone—ochone! ochone!
I have dialled it times without number.
Now the bits lie around—face down to the ground,
And I can't get through to my plumber.
I am nearly insane through the terrible strain—
The bath's fallen through from the attic,
Oh, give me the pain of the manual again—
And be d—— to the old Automatic."

Our readers will be interested in the following selections from the Limericks submitted in connexion with the recent competition held by the London Telephonists' Society. The second won the prize:—

1. A clever young man at Reliance,
Invented a patent appliance,
A hand-set with spout,
That couldn't drop out,
They've made him a B.A. for science.
D. D.

2. These Traffic Instructions *re* Tandem,
Well, I don't think they're issued at random—
They announce each fresh route
In a manner quite cute,
But I'm bothered if I understand 'em.
E. B.

3. Said a Sub. to the night staff at Purley,
"I wish to be called very early,"
But before 3 o'clock
He received quite a shock—
I hear its a boy and a girlie!
C. A. S.

4. On a call office circuit at Royal
A caller who'd been on the oil
Said, "it'sh no use, my dear,
Puttin' pennies in here,
Cos the cistern's beginning to boil!"
C. A. S.

5. Said a Yank in a call-box at Speedwell,
"Say, Sadie, I can't see to read well,
So just put me through
To the local D.Q.—
I want an hotel where they feed well."
C. A. S.

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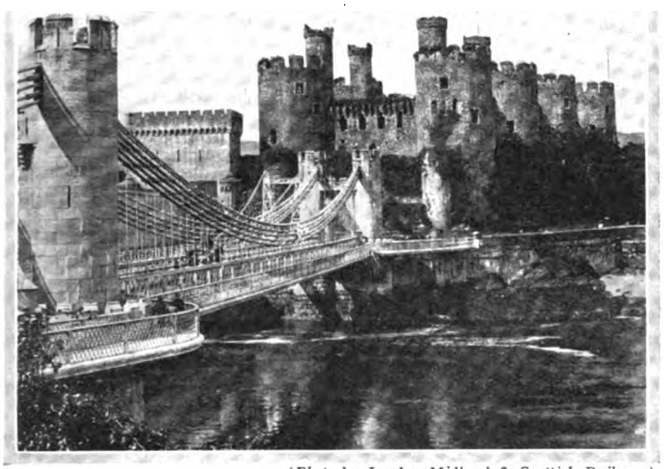
SIEMENS
AUTOMATIC TELEPHONES
IN NORTH WALES



(Photo by London Midland & Scottish Railway.)
CONWAY CASTLE, NORTH WALES.

THE Telephone Service of the beautiful Colwyn Bay area is now being converted to Automatic Working.

Of the three main and two satellite exchanges, Colwyn Bay and Llandudno exchanges were opened in July, 1927, and the remainder are now well on the way to completion.

MAIN EXCHANGES:
COLWYN BAY LLANDUDNO JUNCTION
LLANDUDNO

SATELLITE EXCHANGES:
OLD COLWYN PENRHYNSIDE

The complete equipment designed, manufactured and installed by

SIEMENS BROTHERS & CO. LTD.
WOOLWICH, LONDON, S.E.18.

6. A subscriber attached to Mill Hill,
Complained of the size of his bill,
He said "Calls are put down
When we're all out of town,
And pay it, I'm d——d if I will."

C. A. S.

Western Exchange.

On the occasion of her retirement, Miss A. M. Willett, Assistant Supervisor, Class II, was the recipient of many presents including a cheque for £20 subscribed by her colleagues and friends throughout the service, a gold wristlet watch from the Western Supervisors, a gold and sapphire brooch from the Western Telephonists and Engineers, and numerous personal gifts.

The presentation was made by the District Superintendent, Mr. G. Buckeridge.

Contributions to this column should be addressed: THE EDITRESS, "Talk of Many Things," *Telegraph and Telephone Journal*, Secretary's Office, G.P.O. (North), London, E.C.1.

LECTURE BY MR. F. J. BROWN.

READERS of the *Journal* are invited to a special lecture on the "Relations of Cables and Wireless" to be given in the Fyvie Hall of the Polytechnic, Regent Street, W.1, by Mr. F. J. Brown, C.B., C.B.E. (author of "The Cable and Wireless Communications of the World") on Friday, May 11, 1928, at 6.30 p.m.

Sir Geoffrey Clarke, C.S.I., Joint Managing Director of the Telegraph Construction & Maintenance Co., will take the Chair.

The Polytechnic is close to Oxford Circus Underground Station. The proceedings will terminate about 7.45 p.m.

LONDON TELEPHONE SERVICE NOTES.

Contract Branch.

The following were the results obtained by the Contract Branch during the month of March:—

Stations.

New business obtained	9,517
Ceasements	5,161
	4,356

The ceasements are heavy as usual for the last month of the quarter and the nett gain was practically the same as for the corresponding month of the preceding year.

It is gratifying to be able to place on record that the nett gain in the London Telephone Area during the financial year ended March 31 amounted—for the first time—to over 50,000 stations, 50,348 to be precise.

Further to last month's notes, with regard to the Telephone Development Association's Stand at the Ideal Home Exhibition, orders were secured for a total of 193 exchange lines and 19 extensions, a gain of 97 stations on the figures for the preceding year. In addition to the orders actually obtained, enquiries were received and are being followed up in respect of 315 cases in the London Telephone Area, and 108 in the Provinces.

It will be of interest to the readers of the *Journal* to know that there are now over 900 kiosks in the streets and open spaces in the London Telephone Area, and it is hoped that before the summer—if it comes this year—is over the four-figure mark will have been passed.

Two members of the Headquarter Staff, Contract Branch, have recently married. Mr. Bevan, an Executive Officer, was presented with a Hall Stand,

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and Mr. Leslie Dawe, a Clerical Officer attached to the Development Section, was presented with a set of carvers, some spoons, and a cheque. Mr. Glenny made the presentation in the latter case, and in happy and appropriate words likened the three articles to symbols, each of which has its place in married life. Mr. Dawe acknowledged the gifts with appreciative thanks.

A postcard was recently received at one of the District Contract Offices from a non-subscriber asking for a representative to call in connexion with the Telephone Service. On a Contract Officer calling in the hope of securing an order, he found that the wireless set used by the sender of the postcard was out of order, the owner imagining that the payment of the licence fee entitled him to have it put right by the Post Office free of charge.

* * * *

Cricket and Football.

The results of recent matches with the leading teams have destroyed for this season whatever hopes we had of carrying off the championship.

Two strenuous games with teams at the head of the League were lost, both by the narrow margin of 2 goals to 1. It has to be admitted, however, that the final results just about represented the run of the games.

Recent events regarding the policy adopted by the League in connexion with games postponed are causing some uneasiness. There is a possibility of the practice of permitting clubs to postpone fixtures on the plea of not being able to turn out a team being abused, and when teams favourably situated for honours ask for deferment it seems highly desirable that such cases should be carefully investigated. As vacant Saturdays suitable to two teams are scarce, permission is frequently given, when this is possible, to allow one match to count as two games, in other words to play for four points. It is suggested that this is wrong in principle and should not be allowed, as it frequently gives the one side a distinct advantage and reacts on other teams in the league with designs on the championship. This is a matter which will no doubt receive the earnest consideration of the League Committee.

* * * *

The London Telephonists' Society.

On Friday, Mar. 16, the Sixth General Meeting of the 1927-28 Session of the London Telephonists' Society was held in the Lecture Hall of the City of London Y.M.C.A., Aldersgate Street, E.C.4.

At the commencement of the evening we had the advantage of hearing some very good music. The concert was given by members of the staff of Grosvenor Exchange. The soloist gave great pleasure. Her songs had a most appealing variety and charm. We were able, through the medium of the pianoforte duets, which were so beautifully played, to renew our acquaintance with some of the best contemporary music. The concert was concluded with a very hearty vote of thanks to the artistes.

Great amusement was caused by the Limerick Competition. The six limericks selected for final voting were read by Mr. Horace Dive, and it was found that the most popular one was that submitted by Miss E. Brereton.

The winners of the Photographic Competition were Miss I. Child and Miss S. H. Wilson, and their snapshots, together with those of other competitors, were on view during the evening.

The prize-winning papers for the current Session were read. The first, read by Miss I. Child, of Gerrard Exchange, gave one the impression of pure country air that was most refreshing. The second paper, by Miss A. G. Turner, of Thornton Heath Exchange, was of a quite different nature, but was no less interesting. The title, "Tandem and the Small Exchange," is sufficient to indicate the nature of the paper, but it is impossible to give full justice to the manner in which the subject was treated.

The first paper, with the ambiguous title of "Headquarters," was read by Mr. R. C. Atkins. The whimsicality of this paper was such that, as the reader proceeded in his own inimitable style, delighted ripples of laughter proved more clearly than words how greatly the audience enjoyed Mr. Atkins' fantasy.

The prizes were then presented by the Controller, whose speech formed such a very pleasant part of the evening's proceedings.

In rising to close the meeting, Miss James thanked Mr. Valentine and said how greatly his interest in the activities of the Society is appreciated.

E. McA.

* * * *

The Secretary has approved the following appointments:—

Mr. F. J. BUNCE, Clerical Officer to be Acting Higher Clerical Officer.

Mr. P. J. CANAVAN, Clerical Officer to be Acting Higher Clerical Officer.

THE POST-WIRE.

I AM no telegraph man, yet, do I not recall leaving the Army with a piece of paper in my hand alleging, amongst other things, that I was an expert telegraphist. I suppose they must have been right, but I felt that day as I had done previously when, doffing my kilt, I appeared as a full-blown Sapper in brand-new riding breeches in the streets of Hitchin, Herts. With one eye on my breeches and the other on a pretty girl, I nearly fainted away when asked to assist with a restive horse. Ye Gods! Horses and Telegraphists! Not my forte.

And the Post-Wire? A "cross" between a postal packet and a telegram—a supplement to the Post and Telegraph Service. I wonder if it is practicable and would pay. Here, in Brighton to-day, I want to send my old pal Jones, of Bristol, a message telling him that Cissie is dropping in on them to-morrow. If I post a letter now, eleven ack emma, he will not get it until to-morrow. I'll send a Post-Wire! Sixpence to pay for 20 words, or a shilling for a maximum of 30. On an official Post-Wire form (or any old form will do) I scribble my message to Jones, affix the appropriate stamp, place the form in an envelope addressed simply "Post-Wire," and drop it in my local pillar box. Satisfied that at a cost of sixpence Jones will get his message to-night I toddle home to help Cissie pack.

The Post-Wire message is now speaking: "I am in the pillar box along with other just ordinary letters when the postman comes along and 'bags' us. Arriving at the sorting office we are duly 'sorted out' and I am soon direct on my way to the telegraph room. Here a boy messenger withdraws me from my envelope, cancels the stamp I am wearing, and takes me to the appropriate telegraph stall for Bristol.

Now for a little time, at any rate I am at leisure, for, being of a semi-urgent nature, I have to await the 'idle moments' on the telegraph circuit. Soon my time comes, and with a prefix of 'P.W.' I am on my way rejoicing to Bristol and to Jones.

Written down on a Post-Wire form at Bristol, I am placed in a Post-Wire envelope by the receiving telegraphist, addressed and sent along direct to the sorting office for despatch with the next postal delivery.

May I ask if I, the Post-Wire message, am not worth a trial generally as a means of bringing additional revenue to the telegraphs while at the same time not detracting from the normal postal and telegraph services?

I, a 'Post-Wire,' say as follows:—

(*a*) That I will fill the 'idle-moments' of the telegraph circuits and add to telegraph revenue.

(*b*) That I will not diminish the volume of postal or normal telegraph work. In fact, I am likely to increase it.

(*c*) For Post-Wire Service I eliminate counter staff and special delivery by boy messengers.

(*d*) I will not interfere with that somewhat expensive relation of mine, the 'Telephone-Letter.'

(*e*) I provide a simple scheme of accounting which can be outlined if I am not damned at the outset by conservative friends.

(*f*) The public will welcome the new 'semi-urgent' service and although such messages would be accepted without guarantee of specified delivery, it would be found generally that semi-urgent messages could be sent fairly expeditiously over long distances through the combination of the postal and telegraph service, the latter, as stated, at slack periods.

(*g*) My promoter bids me add: If he has 'asked for it' may his telegraph and postal friends let him have it—in the neck."

GUIDE, PAGE 96.

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THE

Telegraph and Telephone Journal.

VOL. XIV. JUNE, 1928. No. 159.

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All correspondence relating to advertisements should be addressed to MESSRS. SELLS, LTD., 168, *Fleet Street, London, E.C.*4.

TELEGRAPH AND TELEPHONE MEN AND WOMEN.

LIII.—MR. DAVID MILLER.

MR. DAVID MILLER entered the Telegraph Service as a boy in the year 1880, and passed through all the grades to his present position of Chief Telegraph Superintendent at Glasgow. Throughout his career he has constantly displayed outstanding ability, and his opinion on the many telegraph traffic problems is much valued.

He was an enthusiastic Volunteer for 20 years, and in January, 1915, he offered himself for Active Service, and served overseas as a sergeant with the 6th Corps Signals.

He holds the D.C.M. and the Volunteer Long Service Medal, and if he were to don uniform again he would require to wear five decorations before he could pass muster as being "properly

When an Overseer he was selected to assist in the taking over of the Glasgow Corporation Telephones and later of the National Telephone Company. His work in this connexion was marked by great initiative and a remarkable knack in dovetailing conflicting interests.

dressed." One is not surprised, therefore, to observe that his bearing—and his manner, sometimes—reveals a tinge of the military type without being a martinet.

Mr. Miller is retiring shortly, and it is the wish of his many friends that he will long enjoy his well-earned leisure.

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INSTRUCTION OF SUBSCRIBERS IN AUTOMATIC WORKING.

BY J. D. PETTIGREW

ALTHOUGH the character of many of the changes arising from the introduction in London of automatic telephony was evident long before the system became a practical issue and set up a train of advance preparations, certain features of the conversion have perforce to wait for what may be described as execution without trial, when the event was imminent. One of such matters was the instruction of subscribers, and it may be of interest to sketch the manner in which this task was performed.

The work, of course, represents quite an innovation—under manual conditions the elements of telephone knowledge on the part of subscribers, as a whole, can safely be assumed, and while one would hesitate to say that their education does not need fostering, it can be said that the subscribers' influence is limited by the intervention of the telephonist between himself and the switching plant—he stands protected from "major irregularities" and, in his own view, divorced from responsibility. The situation changes, however, when the subscriber can exercise direct control over the mechanism and his proper instruction becomes a matter of considerable importance.

The means of education adopted can be classified under four headings, viz :—

1. Notices in the Press.
2. Demonstration on the Director units (situated in the vicinity of the exchange and also at Headquarters).
3. The distribution of a special descriptive brochure to each subscriber.
4. Personal visitation of the individuals using each instrument.

Space will not permit of more than the enumeration of the first three items ; passing on to the last it should be mentioned that the explanation given is based on the relative subscribers' instruction card and is concluded by a practical demonstration. The delivery of the cards in this way (normally the supply devolves upon the Superintending Engineer) is perhaps a noteworthy point.

With regard to the second object of the visit, viz : the practical demonstration of actual calls to automatic equipment, the end was achieved without actually interfering with the Exchange plant—a consideration which has very great and obvious merits. The engineers provided and placed in the switchroom, a number of self-contained switching units which accept the dialling of pre-arranged numbers and actuate calling lamps corresponding to these numbers—the signals being answered at the unit by a telephonist who thus simulates in turn a subscriber, "Trunks," "Toll," "Enquiry," &c. Specific numbers give the respective tones.

Connexion to these units is effected over special circuits from the manual exchange. It may be remarked that, while this arrangement was comparatively simple in the case of Holborn, Bishopsgate with seven contributory exchanges presented the engineers with a harder problem ; solved by the provision of a Distribution position at which all the junctions from the contributory exchanges terminated and also the lines to the units.

Smooth demonstration has been found a great asset in impressing subscribers—it is needless to add that when defective it also has potentialities for depressing them : then the psychological effects may be serious.

To turn back to the initial considerations which arose when the field of action was surveyed—the chief point was the question of staff : good address and sound knowledge of telephone working were primary qualifications in the officers selected, and suitable men were obtained from the ranks of the night staff and supplemented by a number of telegraphists ; all of whom rendered good service. For Holborn the number of officers was estimated without the guidance of precedent, and incidentally it was gratifying to find that the basis of the forecast corresponded closely to experience, viz : an overall average of 55 visits per week per man. It will be seen that little more than half an hour (which included travelling time) was allotted for each average visit.

A special course of training in the Automatic System was arranged for the men and covered, with some modifications, the course of lectures and study adopted for the operating staff. A particular feature of the training included the description and inspection of all types of subscribers' apparatus, i.e. switchboards of standard types and simple extensions as denoted by the various plan numbers.

Preliminary to the visiting work, it was of course, necessary to create an organisation and to devise a system for controlling it. This fell functionally to the observation and Training Section (with Headquarters at Queen Victoria Street).

The system adopted was that of a card index, each subscribers name and address is shown (by the use of the addressograph) on a specially printed card, the reverse side of which consists of columns used by the visiting officer to record the various items dealt with on his visit. It was necessary to show the details of subscriber's installation, and for this purpose access was obtained to the Fault and Information Cards, by co-operation with the local engineers.

The completion of this task gave information of particular value for visiting purposes, viz : the ration of installations to lines and the actual constitution of the former. The figures for Holborn were illuminating—roughly 27% of the total installations being switchboards, 50% direct lines, and 23% "plan" extensions.

The visiting men were grouped in relation to an office staff of four telephonists. They were supplied with the cards for each day's visit, together with the relative subscriber's instructions cards, and on the following day the information entered by the visiting officer on each card was recorded and summarised.

The following types of summary were kept :—

Fault Schedules.
Lists of subscribers available for a test call after transfer.
Application for dialling tops.
,, to visit Exchange.
Contract Matters.
Miscellaneous.

The Fault Schedules included discrepancies which arose from an inspection of the installation, definite faulty apparatus or defective demonstration, indicating the probability of faulty dials, &c.

The office work proved heavy—the quantity of subscribers instruction cards handled was naturally of considerable magnitude, and each card required the insertion of emergency numbers in addition to the subscriber's number—the despatch through the post of the brochures was also an item involving some labour.

It was naturally found that the visits led to many miscellaneous enquiries from subscribers, and it might be appreciated that special activity prevailed at Headquarters during the brief period when the men attended each morning for report.

At the conclusion of their training the visiting staff were given a detailed statement of all the points to be covered during the visit.

On the whole, subscribers gave the men an attentive hearing and assisted by assembling their staff for group instruction. Some subscribers had, of course, to be disabused of preconceived ideas of dialling and, for example, dissuaded from dialling the full name of the exchange, or gently reminded that City was spelt with a "C" not an "S."

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Subsequent visiting has confirmed the impression that accurate spelling is a definite factor—one P.B.X. telephonist's habit of constantly dialling "SID" for Sydenham, came to light after the opening of Holborn, as a result of a complaint that a number on this exchange had never been obtained without the assistance of "O."

For some reason the disclosure was accompanied with blushes. Confusion of another character, viz: "I" for "one" was early encountered, but Hampstead commencing with an "A," although intelligible as a phonetic lapse, was unexpected. The relegation of the "H" to a "dropped position" cannot fairly be claimed as one of the economics of automatics.

The switchboard cases presented special features. A large proportion of the smaller boards (principally of the cordless type) are not regularly staffed, and the habit of passing numbers from the extension points was, and is, prevalent under manual conditions.

It was soon found that subscribers were asking for additional dials at extension points, and the intermittent use of the night switching keys, cutting off calling signals at the board, had, of course, the potentiality for trouble. A point that needs emphasising to subscribers with cordless boards, is the fact that the control of originated calls rests with the extension point. This "through clearing" feature, is in the future, to be standard for all types of switchboards, and this fact may be worth comment.

It will, of course, meet the situation that arises on cord boards, where through dialling from extension points is specially desired while the board is staffed—this practice is, of course, regarded as irregular from an operating point of view, but the facility is present and exercised under Manual conditions.

It cannot, of course, be hoped that one brief visit will achieve 100% efficiency in instruction and create the perfect subscriber, free from error in perpetuity: there are naturally two parties to instruction, and the subscribers view point must not be overlooked—he may have difficulty in retaining all the various points which we seek to impress upon him in advance: in some cases he may even discount the whole explanation until the actual situation arises to stimulate his interest. For example, one subscriber re-visited after the transfer complained that he was unable to use his instrument owing to the "dizzy noise" every time he lifted his receiver—he was found to refer to the dialling tone!

It is clear that a degree of education by experience must follow the initiation into automatic working, and service inspection provides a useful means towards the post-education of subscribers.

The visiting duties call for much tact and knowledge of human nature; this was evident in the first days of service inspection in the Holborn area, when in the midst of criticism and qualified statements of the quality of service, a definite commendation was specially welcome. Two experiences are quoted to show that approval may be misleading and that grounds of complacency may vary. In one, the preliminary enquiry as to service made by the inspector to a subscriber's P.B.X. telephonist, elicited an emphatic "very satisfactory," the confident request for a test call to be passed, however, met with the disconcerting reply "Sorry both my lines have been out of order for two days." It was necessary to place oneself in the speaker's position (a comfortable one by the office fire) before his point of view could be appreciated.

In a second case a different standard of satisfaction prevailed—and it was approvingly stated that the entire absence of incoming calls had allowed the subscriber and his staff to proceed with Christmas orders without being harassed for delivery.

Another factor to which visiting officers have to adapt themselves, is the difference in type of subscribers. The variety has been increased considerably in connexion with Bishopsgate, where a very keen type of business man is met with: unfortunately, English does not everywhere prevail. The nature of the language difficulty was expressed by one of the visiting staff remarking after his first day that "his arms ached with talking."

The appearance of visiting officers armed with official attaché cases has also given rise to some misapprehension—not to say misgivings—and a case is known where one of the staff had to assure an individual that he was an officer of the Post Office, not of the Police.

These lighter incidents added interest and variety to a job which was arduous enough at times; there is, however, no doubt, that the intensive campaign of subscribers' education contributed contributed also to the experience of those engaged therein.

In conclusion, the battles of Lincoln Inn Fields and Spitalfields are now over and all are looking forward confidently to the fresh fields to conquer in the regions of Sloane and Western.

RETIREMENT OF MR. W. A. MATTINSON.

A REPRESENTATIVE gathering assembled in the Deputation Room on Tuesday, May 8, to say "Goodbye" to Mr. W. A. Mattinson, late Assistant Accountant-General, at the close of his 42 years' service in the A.G.D., most of which time had been spent in the interests of the Telegraph and Telephone Services, especially the latter. Mr. Mattinson was an outstanding figure in the telephone section of the Accountant-General's Department for many years. He possessed unrivalled knowledge not only of telephone accounting but of the staff organization of the London Telephone Service and the Provincial offices. His acquaintance with National Telephone Company goes back to the Oxford Court days and his knowledge of the Company's organization and methods gained by many years spent on royalty audits was invaluable at the time of the transfer in 1912.

His subsequent work on Telephone Staff organization led to requests for his services on similar questions both in the Department and elsewhere.

Sir Henry Bunbury, in presiding, suggested that it was difficult to realise that the time had arrived for our friend's retirement as he neither looked, acted or felt like a man of 60 years. Sir Henry recounted some of the large economies which Mr. Mattinson's proposals had effected not only at Headquarters but also in other Departments. We are reminded that Mr. Mattinson's retirement would mean the removal of a familiar figure to many in the District Managers' Offices who have been accustomed to regard his decisions as the last word in accounting matters. Mr. Stirling, of the L.T.S., paid an eloquent testimony to the thorough way in which Mr. Mattinson had mastered all the details of telephone accounting and to the cordial relations which had existed between him and the staff of the L.T.S. Mr. Kelly spoke of 30 years' experience in the Telephone Audit Branch with Mr. Mattinson, referring to his quick perception, sound judgment and generous treatment of his colleagues; while Mr. Briggs humorously explained how greatly the reputation of the Cashier's Branch had been enhanced by his action since that branch came under his oversight.

After the formal presentation of a B.S.A. Sporting Gun and some garden furniture, Mr. Mattinson expressed his thanks in a very characteristic, witty and entertaining speech which formed an appropriate finale to an eventful career. His many friends wish him long life, health and happiness in his country home.

THE LATE ALFRED ROSLING-BENNETT, M.I.E.E.

WE regret to record the death of Mr. A. R. Bennett who was well known to the pioneers in telephony in this country. He was General Manager and Chief Engineer to the National Telephone Company for Scotland and the North of England from 1883 to 1890. Subsequently he became General Manager to the Mutual & New Telephone Companies. Later he was Chief Engineer to several Municipalities which embarked in schemes for telephone service.

Mr. Bennett wrote several books and pamphlets on Telephony, Locomotive Engineering and cognate subjects, and read papers before the "British" and other learned Associations.

Mr. Bennett passed away on Thursday, May 24, at Matlock, where he had gone to recuperate after an attack of bronchitis.

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AN AUTOMATIC UNDERGROUND CABLE LAYER.

BY J. J. T.

A MACHINE, said to be the only one in existence, is now on the market which simultaneously

(1) digs a trench, generally about 18 inches wide and five and a half feet deep—depending upon the adjustment of the bucket ladder;

(2) lays the telegraph, telephone, or power cable in the trench;

(3) replaces the soil in the trench; and

(4) rolls and smoothes over the latter.

A full view of the complete equipment is shown in Fig. I, and the outstanding feature is that it can be operated by one

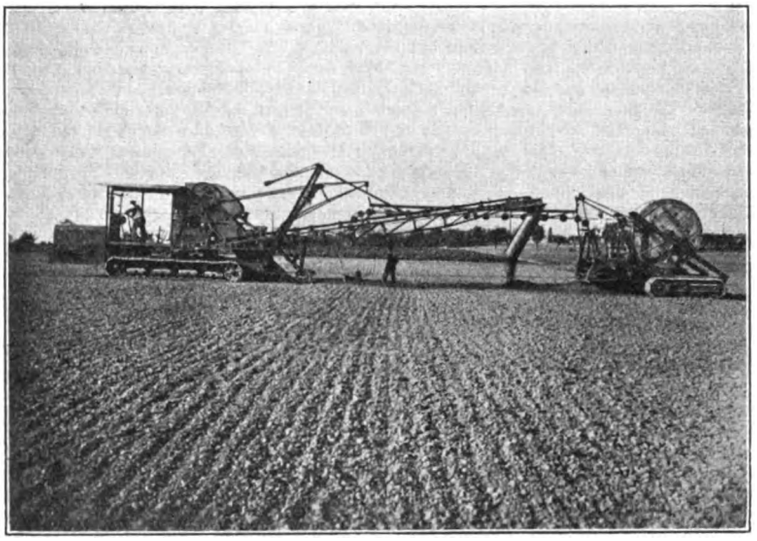

FIG. 1.

driver and three or four labourers. It can actually lay, up to 300 feet of cable per hour, performing the three other operations at the same time. The excavator, on "caterpillars," will be noted on the left of photograph, with a closer but back view in Fig. II of the same. In the latter are also shown the excavating buckets, and an adjustable cross conveyor which either heaps the excavated material alongside the trench or diverts it on to a belt conveyor which in that case passes the soil to an adjustable shute, Figs. II and III.

The truck which carries the reel of cable (seen at the rear in Fig. I, full view Fig. III) is fitted with three sets of "caterpillars," the rear caterpillars which carry the main load being fitted to the sides, while the third set is fitted centrally to the front of the truck. This set is pivoted on a vertical axle, and naturally controls the steering of the whole truck which has no separate drive being drawn by the excavator. The manipulation of the steering is done by means of a hand-wheel and worm-drive from the platform, as also seen in Fig. III.

The excavator itself is driven by a four-cylinder Diesel motor of 40/45-h.p., running on crude oil.

The writer was curious enough to make enquiries as to the limits of this ingenious time and labour saver as regards the nature of the soils that could or could not be dealt with.

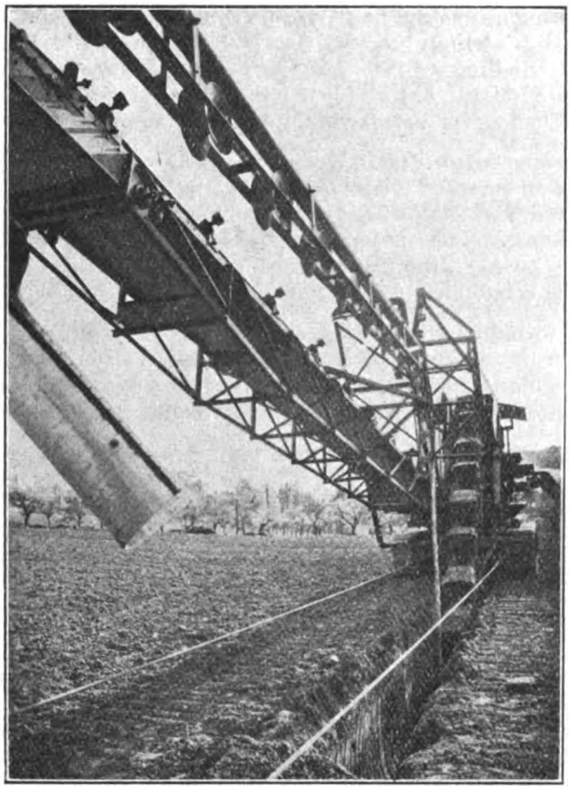

FIG. 2.

In reply thereto the London agents, Messrs. Richter and Pickis, Industrial Engineers and Contractors to British and Overseas Governments, were good enough to supply a special report from the engineer of the Weserhuette A. G. Bad Oeynhausen i. W., Germany,

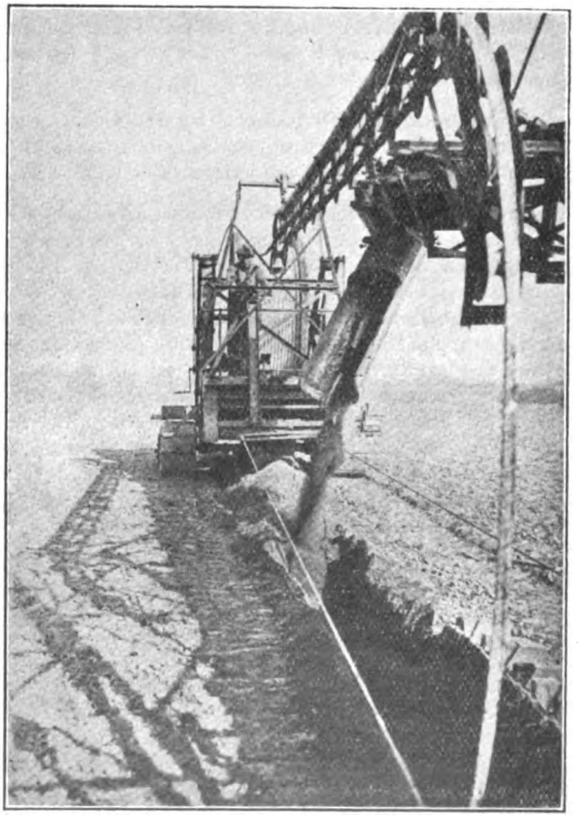

FIG. 3.

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who stated that the same type of their excavator was actually working in Essex—where the soil is admittedly not difficult—but that successful tests had been made with stony soil, heavy clays, and clay and stone agglomerate, and that generally speaking all stony ground could be dealt with except where the sub-soil was actually solid rock.

The photographs were kindly supplied by the Messrs. Richter, and this brief description may prove of interest to those interested in the economics of underground cable laying in this and in other countries where electrical progress is forging ahead.

HEADQUARTERS.*

BY R. C. ATKINS ("PERCY FLAGE").

MAETERLINCK, as you know, wrote the "Life of the Bee," and since I read it I have often thought how refreshing it would be to read the "Life of Maeterlinck"—as written by the Bee. No doubt it would contain both honey and sting, but the Bee was apparently too busy to bother about Maeterlinck. Boswell wrote the "Life of Johnson," but Johnson did not feel impelled to return the compliment and write the "Life of Boswell." His omission leaves the world of letters poorer, but probably Boswell has reason to be grateful. But in each of these cases there was another course open—both Johnson and the Bee might have written their own life, but, with the modest indifference of the truly great, they did not. Had they done so, however, there were two possible ways in which they could have written of themselves. Johnson might have written of himself as Johnson saw him or as he thought Boswell saw him, and the Bee might have taken either the Bee's-eye-view of itself or that of Maeterlinck. So far as I can ascertain, Headquarters has not yet written "The Life of the Exchange Staff," nor has the Exchange Staff written "The Life of Headquarters," and neither has really written of itself. With these thoughts in mind, therefore, and sinking the modest indifference of the truly great, I have written of Headquarters. When I commenced my paper I did not know whether I should write from the Headquarter's point of view or from that of the Exchange Staff. It was even possible that I should write as an amused spectator, for with a contrariness which I feel is reprehensible, I have found humour in Headquarters. Many a man has been burned at the stake for less heresy.

Strictly speaking, of course, the Headquarters of the London Telephone Service is Cornwall House, Waterloo Road, but we of the Traffic Branch think rather of 32, St. Bride Street as Headquarters. There is a fundamental difference between them, for while Cornwall House is concerned in the main with the earthly business of collecting from the public, St. Bride Street, as representing the Traffic Branch, is concerned with the high and noble calling of *giving* to the public. Furthermore, and although I should not wish to say anything derogatory of Cornwall House, I find it a little difficult to conceive a love for a place to which I might be called up to-morrow on the carpet to meet my Waterloo.

Consider, too, how entirely appropriate is the name—St. Bride Street—to a service which is in the nature of a sisterhood. I am told that normally there is an annual loss in the telephonist force of about 10%—mainly, I believe, for marriage; and here, by the way, let me protest. This loss is called wastage! What a term, what a libel, what a shame! As if resignation for such a purpose could be called a waste. Marriage, then, and Bride. Why! how natural. And again Saint. The Bride is always a Saint—whatever she may have been previously, or may become afterwards. Furthermore, the building abuts on to Stonecutter Street—an obvious reference to the stones in the engagement ring. And finally, across the way is Shoe Lane—reminiscent of the old shoe which invariably figures at weddings as the emblem of good luck.

The building stands close to the site of a Plague Pit and in moments of desperation, when the patience of even a telephonist, let alone of a Job, is exhausted, one is tempted to wish that such pits were still available into which one could drop the most plaguy subscribers. Nearby is Ludgate Circus, which immediately gives rise to thoughts of King Lud—not "The King Lud"† of which, as ladies, you will have no knowledge, but the historical King Lud. According to some he is a Mrs. Harris—there "wasn't no sich person."

The St. Bride Street building has no beauty of itself, but it is Headquarters—the seat of the mighty. I don't know how you regard Headquarters. Perhaps you may think of it as the abiding place of "They who must be obeyed"—persons equally mysterious as Rider Haggard's creation but most decidedly without her comeliness of face and figure. And in this you would be right. Or you may think of it as a laboratory where scientists are engaged in fitting human souls into mathematical formulae. Possibly you think of it, without hate, as a geological museum full of fossils. In this I judge it expedient to be discreet rather than valiant. Maybe you regard it as a meeting place of interfering busybodies and in the literal sense you would be right—for they *do* interfere, they *are* busy and, at least, they *all* have bodies. Whatever your view is of Headquarters, however, it must appear remote and aloof: situated, perhaps, "Far from the madding crowd" or "Under the greenwood tree" and doubtless as obscure as "Jude" and just as incomprehensible. Certainly omnipotent, but fortunately not omnipresent. As a place it may seem cold and unresponsive. As a collection of individuals it may arouse some interest, for it may be that they are human and someone may love them—though, of course, the latter will only enter your head as a wild imagining ending in a laugh.

Let us, then, explore it and view the exhibits. Just as there are four quarters in any whole so there are four floors in the Headquarters building. Of the ground floor I will only speak in passing, and with some degree of apology. In truth it is not part of the Traffic Branch. It is devoted to the craft of the Contract Branch. In one part they lay in wait for the souls of men and persuade them to have telephones. In the other part—the Development Section—there dwell prophets and seers—young men who see visions and old men who dream dreams—they who say that 5, 10 and 15 years hence the green fields of suburbia will sprout telephones. I fear they dabble in the Black Arts and Magic and have familiar spirits. Even their signatures are like the signs of the Zodiac. In moments of abandon I have ventured into their territory thirsting for knowledge, but I have secured only a vivid description of my own character and a sure indication of my ultimate destination—5, 10 or 15 years hence.

Passing quickly to the first floor, we are safe in the precincts of the Traffic Branch, impressive with a cloistered calm so that we are impelled to speak in whispers. Here we are on the threshold both of the Traffic Branch and of a great and glorious career for one step forward takes us into the domain of the Superintendent of Female Exchange Staff. Here let me deprecate the use of the word "female." It is a cold and callous word and quite unsuited to the grace and beauty of womankind—particularly of our womankind. To proceed, it is recognised, of course, that no business can ever be commenced in a Government Office unless first of all a form has been duly filled in, completed and signed. It is here that the "Young Visitor" encounters this solemn and peculiar rite. Then the aspirant proceeds for interview and she is weighed in the balance by kindly critics. Many essay to enter but few are chosen and you who are here may therefore regard yourselves as the cream which has risen to the top. It is here, too, that the "Young Visitor" is converted into that new species of state servant, the 36-hour telephonist. How it is done I do not know, but I suspect vivisection. To all intents and purposes, however, the 36-hour telephonist looks just like an ordinary mortal.

From thence we pass up the stairs to the second floor, into the very presence of the Assistant Controller of Traffic, for it is on this floor that his office is situated. From this room he directs the affairs of traffic, plotting its course on numerous charts and ruling over the community with a slide rule. If rumour speaks true, he entertains a warm regard for Christopher Columbus, because he discovered America. The modern grace in telephone practice is "For what we are about to receive—was originated in New York." Passing from the scene of supreme authority we encounter pathos, for we are in the Service Section. No one ever utters a word of encouragement to the Service Section. No one ever says to it: "Your telephone service is the finest in the world and we positively enjoy using the telephone." Speaking metaphorically, it may be said that the Service Section is where the sins of the children are visited upon the fathers. All day long, every day, week in and week out, and year after year, the Service Section listens to complaints. My calendar says that grouse shooting begins in August, but for the Service Section grousing begins on Jan. 1 and it never stops. Their outlook on life is grey and is adequately summed up in T.I. No. 425, which states that letters of commendation should be filed with written complaints. Who can blame them for such cynicism? Think tenderly and sympathetically of them in their affliction.

Next in geographical order is the Establishment Section—a section full of loving kindness and tender mercy. Believe me or believe me not it is no uncommon thing to find the members of this section in tears, because they have found it necessary to reduce the staff of an exchange. This Section supplies vacancies, and they have a scheme in hand whereby all exchanges in future will be staffed entirely with Redundant Operating Hours. They occupy much time in putting triangles on straight lines and if you were to ask them why, they would tell you that the triangles represent the meal reliefs. It seems a curious convention to me. I have often heard of square meals, but never of triangular ones. The sadness and tears of these two sections are balanced by the wickedness of the next section—the Staff Section. This Section sets itself deliberately to encourage men to stop out late and to stay away from home all night. If this Section had unlimited powers, I should fear for the home life of England. No men would be at home at night and—what is infinitely worse for their wives—they would be at home all day. Nothing is calculated to disturb domestic harmony so much as to have a man pottering about at home during the day—so my wife tells

* A paper read before the London Telephonists' Society, March 16, 1928.
† A well-known tavern in Ludgate Circus.

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me. The only redeeming feature about the Staff Section is that it deals with wages—your wages, not mine; I know them too well.

The third floor shelters the Sections which design manual and automatic exchanges and with them is associated the Statistical Section. Statistics are the life blood of the Traffic Branch and while there are some who ask for more statistics in order to avoid anaemia, there are others who favour the old-fashioned remedy of bleeding. The work of designing an automatic exchange is extremely complex and involves methods which are fearful and wonderful. The resulting exchange is wonderful and fearful. The automatic exchange is a triumph of human patience and ingenuity and the precision of its operation is uncanny. It is almost human—but only almost, and it is left to you to supply that personal touch which is so vital to the smooth working of any telephone system. That personal touch will become increasingly necessary as mechanical methods multiply. The automatic Design Sections are constantly meeting and solving new problems and imagination must run hand in hand with scientific exactitude. These Sections in the future will be staffed with bald heads and corrugated brows. The Sections dealing with Manual Working occupy the third floor back, and Jerome K. Jerome would have delighted in the characters to be found there. The staff is wholly male—spelt with a W and not an H. Once they had a lady clerk but tradition says that they smoked her out of existence. With the gradual increase of automatic exchanges they are looking forward, I understand, with pleasurable anticipation to the "Passing of the Third Floor Back." Briefly, it may be said, before leaving the third floor that their diet consists mainly of peg counts, calling rates and equating factors. As an occasional treat they have an All London Record for a dessert.

Now for the fourth floor, which, as being the top floor of the building, is nearest to Heaven. Here we find the Buildings Section. When we think of the countless millions of words which are passed over the telephone and of the several languages used we may well believe that the Section which is responsible for our exchange buildings must also have been responsible initially for the Tower of Babel. They supply furniture too—but not in the Drage Way—and their miscellaneous tasks are manifold and marvellous. They told me that during cold weather they are responsible for heating our offices and buildings, so you can see that they are a merry lot of fellows who enjoy a good joke. Last, but by no means least, we have the Dining Room, and even if you have not so far been persuaded that the staff at Headquarters is human you must now be convinced. It is a humbling thought that even the greatest amongst us shares the common necessity for feeding. You may differ from me when I say that Headquarters must eat to live, because you may see no very good reason why they should live. Whether reasonable or not, however, they have that curious desire to go on living and they do therefore feed. Though remarkable in many ways there is nothing extraordinary in the food they eat. It is just the commonplace food of the normal individual which shows again how wrong you would be if you thought of them as supermen and superwomen. One of the higher officials, indeed, has been known to eat bread and cheese, apparently with great relish, but an infinite number of the wildest subscribers should not make me reveal his identity nor divulge whether he had anything stronger than water to drink.

Before I conclude I feel that no account of Headquarters would be complete without a reference to the crane and the lift. The crane is not a bird but one of those instruments for raising things from the ground. I used to think that lifts were for the same purpose but experience of the Headquarters lift has dispelled that childish illusion. The crane is a survival of the day when the building was put to the grosser uses of commerce. Now it hangs silent and mournful, like a disengaged cab-horse and reminds one of Mr. Micawber. It could be used, of course, for suspending London's very worst subscriber by the neck as a warning to the others or it could be used similarly to create more room at the top of the seniority list, but I do not advocate its use for either purpose.

Much has already been said about the lift but nothing that could with propriety be included in this paper. I would not have you suppose that it never works. It must do that sometimes because the liftman gets his lunch from the dining room and whoever heard of a liftman walking upstairs. Neither could he fly, for although he is a very nice man he is no angel. But its periods of duty are rare, spasmodic and uncertain. Our statistical experts are now endeavouring to calculate what is the average number of lift journeys possible per officer per annum and how long it would take one man to make one journey from one floor to the next, for periods of 5, 10 and 15 years hence. The calculations, I understand, are being based upon the Theory of Improbabilities.

This, then, is or is not Headquarters, just as you prefer to regard it. On looking back through my paper, I wonder whether I have done justice to it either as a symbol or as an institution. It is not more of a joke than most of the other serious things of life and its staff are colleagues with you in the common cause of doing a certain job of work for the convenience of our neighbours. I am told that in some branches of the Service there is a very marked class conciousness between the different grades of staff.* I am glad to think that such horrible snobbery does not exist in the London Telephone Service. Half the trouble in the world arises because people do not understand each other and the other half arises when they begin to try. Happy the people who can understand without trying—and that it seems to me must be the basis of our relationship with each other.

* We think that *most* branches of the Service will protest with alacrity: "Not in our Branch!"—ED., *T. & T. Journal.*

BACK TO HANDWRITING AGAIN.

FROM "THE ECONOMIST," MAY 12.

THE announcement that the Post Office engineers are perfecting a system of telegraphing pictures or designs in facsimile raises many curious conjectures. Hitherto telegraphy has been essentially alphabetical. Whether in its form of printing telegraph or of symbolical telegraph (such as the Morse), it has been based upon the 26 letters of the alphabet, in Roman form, and the 10 digits. There have been some odd limitations against which telegraphy has always struggled. It has never been quite at ease with whole numbers and fractions, and special steps have had to be taken to distinguish between "eleven-thirty-seconds" and "one and one-thirtysecond." There have been discussions as to the allotment of symbols to accented letters, and nations have differed as to the most necessary of the marks of punctuation. There have been even greater tribulations. Certain modern kinds of telegraph apparatus, based on the precedent of the typewriter, and using permutations of five positive or negative signals, have been limited to thirty-two in all (without a shift key), so that Japan, with its much more inclusive alphabet, has not been able to use them. China is in even worse plight. Its pictorial method of writing called for the use of a dictionary at telegraph counters so that each picture was translated into a number—a device which China owes to Sir Robert Hart. Hence at the last International Telegraph Conference China appealed to be allowed to use the four figures of this dictionary to signify a word in those cases where the regulations insisted upon plain language and not code or cipher. The appeal was granted, but it brought into the foreground the fact that Eastern languages were at a disadvantage in the use of modern telegraphy. So that when a French inventor claimed as one of the advantages of his pictorial telegraphy that it would help the nations who had non-alphabetical languages he made a shrewd hit. Should the new system become general it will consign masses of regulations to the dust-heap, for the definition of what constitutes a word for purposes of telegraphy, and within what limits combinations of alphabetical letters should be allowed, has come to be an international problem.

But the new discovery seems to come at a strange moment. Throughout the telegraphic world the use of machines on the typewriter model is now in the ascendant. There are machines which can be used in multiplex with as many as eight machines on one route. There are adaptations of the same principle for use on lines which are less heavily loaded. In America the symbolical telegraph of the Morse pattern is used with a typing telegraphist. Oddly enough, as readers of the life of Samuel Morse will remember, he invented the Morse telegraph as a substitute for the Hughes printing telegraph, which was so restricted by patents that the telegraph company with which Morse was connected could not use it, and therefore had to seek another solution. If it had not been for the rivalry between these two telegraph companies probably printing telegraph of the Hughes pattern (as in Holland to-day) would have become general. But Morse set going a fierce conflict. England came down on the Morse side, with handwriting. France sought its own solution with the ingenious Baudot, the pioneer of the modern five-unit system. Wheatstone, in 1870, added to the attractions of Morse by his high-speed system, and a British inventor, Creed, turned this into a printing telegraph, while another British inventor, Donald Murray, brought the five-unit system with typing into its present position. Thus, we may say, the forces swayed. It seemed but yesterday that the print had won. Learned committees and business committees subscribed to the victory. Handwriting was at a discount. China must stick to its figure translation and Japan to such telegraphy as fits in with its alphabet. The typewriter having dominated the rest of the world, now dominated the telegraph world.

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And then, it seems, someone finds out that there is an attraction in handwriting. There are instances, it is said, where the sight of certain handwriting makes the heart beat faster, in a way which would never apply to typing. Science discovers a method, at the opportune moment, whereby that which is put on paper can be reproduced by combined electrical and photo-chemical means. In fact, science has produced several methods. Let no one imagine that the apparatus will be put into the telegraph office in every village and hamlet and by-street. Rather it will be a sort of refined and superior telegraph to be used on selected routes. At the outset it is to be used on one favoured route only. There will need to be some sort of censorship, for, desire it who may, it will not be permissible to telegraph an ugly Valentine. It will not be the case that, provided you pay the appropriate rate per square inch, you can transmit anything you like. There will be, for the purposes of the new telegraphy, pictures which are proper and pictures which are improper. Yet it will bring telegraphy something nearer to the human touch. We have allowed our secretaries and our telegraphists to interpose between us. Our communications have borne the sad evidences of being machine-made. Such a very human note as the difficulty of spelling a word like "receive" altogether vanishes at the touch of a skilled typist. The new telegraphy, under the guise of telegraphing pictures or designs or writing in facsimile, will reveal us as we really are. Our misspellings will lie naked and unashamed before our correspondents. No more shall we be asked to "write legibly," for, obviously, that was for behoof of the telegraphist. We shall write humanly and warm the heart of the recipient, even if sometimes we raise his ire at the difficulty of interpretation. When all is said and done, progress has its own circles; and telegraphy, which comes back to handwriting—and to our own handwriting—is not the least significant instance. For, after all, it *is* telegraphy!

PROGRESS OF THE TELEPHONE SYSTEM.

THE following gives a brief review of the growth in the telephone system during the past financial year.

The total number of stations working in the Post Office system at Mar. 31, 1928, was 1,631,191, the net addition in stations being 122,405, the highest increase on record. This increase, together with the net addition for the years 1923-24 to 1926-27 gives a total net addition during the last 5 years of nearly 600,000 stations, the increase year by year being as follows:—

Year	1923-24	...	...	109,459
,,	1924-25	...	...	115,308
,,	1925-26	...	...	116,353
,,	1926-27	...	...	118,633
,,	1927-28	...	...	122,405
				582,158 = 55%.

The following table shows the growth for the year in London, England and Wales (excluding London), Scotland and Northern Ireland:—

TOTAL NUMBER OF STATIONS.

	At Mar. 31, 1927.	*At Mar. 31, 1928.*	*Increase.*	*Increase %.*
London	532,066	578,322	46,256	8.7
England & Wales (excluding London) ...	817,356	883,435	66,079	8.1
Scotland	140,013	148,934	8,921	6.4
Northern Ireland ...	19,351	20,500	1,149	5.9

Residence rate installations at Mar. 31, 1928 numbered 133,220 in London and 211,906 in the Provinces, the total 345,126 representing an increase of 42,065 or 13.9% for the year. The net increase in business exchange installations for the same period was 30,089 or 5.2%. Residence subscribers at Mar. 31 last represented 36.1% of the total exchange subscribers as compared with 25.2% at July 1, 1922, when the lower tariff for residence lines was introduced.

The number of Public Call Offices working at Mar. 31, 1928 was 24,054, of which 5,224 were in London and 18,830 in the Provinces. The net addition for the year was 2,120 (9.7%) a higher number than recorded any previous year. Kiosk Call Offices have contributed largely to this increased development, and the net addition during the year of 1,636 kiosks (making 4,687 in all), represents an increase of 54% on the March, 1927, total. Kiosks in the London area have increased during the year from 465 to 887 (91%) and in the Provinces from 2,586 to 3,800 (47%).

During the year ended March last, 111 new exchanges were opened under the Rural Development Scheme of 1922, bringing the total number of exchanges opened under the scheme up to 1,141.

The number of rural party line stations at Mar. 31, 1928, was 10,215, an increase of 175 for the year.

A considerable amount of progress was made during the past year in connecting railway stations in rural areas with the public telephone system, largely as the result of the arrangements agreed upon with certain of the railway companies in regard to the provision of call office circuits. At Mar. 31 last 890 railway stations in rural areas were connected with the telephone exchange system, or 145 more than at the end of the previous March. In 683 cases circuits have been provided for the railway company on rental terms and in the remaining 207 cases, Call Office circuits have been provided.

The number of effective calls originated during the year 1927-28 is estimated at 1,173 millions, or 72 millions more than the total for the year 1926-27. This total represents a 6.5% increase for the year and compares with an 8.2% increase in direct exchange lines, which at Mar. 31, 1928, numbered 1,041,543.

At the time of going to press, complete results for the year 1927-28 in respect of trunk calls were not available, but the number of inland trunk calls for the year is estimated to have been 102,350,000, an increase of 7,689,000 or 8% on the previous year's total. The number of outgoing international calls for the year was approximately 340,000, and the number of incoming international calls approximately 361,000, representing increases of 20% and 15% respectively over the figures for the year 1926-27.

Further progress was made during the month of April with the development of the local exchange system. New exchanges opened included the following:—

PROVINCES—Keighley (automatic), Macclesfield (automatic), Seaford.

and among the more important exchanges extended were:—

LONDON—New Cross.

PROVINCES—Acocks Green (Birmingham), Bilston, Camberley, Dorchester, Falmouth, Harrogate (automatic), Heaton Moor, Hitchin, Maidenhead, Oldham, Peterborough, West Bromwich, Weymouth, Windsor.

During the month the following additions to the main underground system were completed and brought into use:—

Aberdare—Junction Aberdare cable,

while 75 new overhead trunk circuits were completed, and 86 additional circuits were provided by means of spare wires in underground cables.

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TELEGRAPHIC MEMORABILIA.

ARGENTINA.—*The Times Engineering Supplement* of May 5 gave some very interesting facts and figures regarding the markets for wireless apparatus in Latin America. Referring to Argentina their correspondent says: "Argentina is served by 20 transmitting stations, which operate under the general control of the Government, although private individuals may be the actual owners. Estimates give the number of radio receiving sets in Argentina as 145,000, the bulk of which are concentrated in the Buenos Aires district. While crystal-set users are in the majority, multi-valve sets have recently had a fair market—notably the three-valve model.

"There are signs that the more advanced type of receiving set is gradually obtaining a bigger sale, and the business in components for home construction is good. The competition of the United States is strong in Argentina, especially in complete sets, and both France and Germany have invaded the market, the German competition being especially strong in head-receivers.

In general there are no adverse climatic conditions and good reception can be had from Buenos Aires at the towns and townships scattered throughout the country. As might be expected, the seasonal character of radio business is as marked as in Great Britain, summer being slack and winter the peak period."

Considering the various South American States as markets, it is apparent that only four have developed broadcasting to any appreciable extent—Argentina, Brazil, Chile and Uruguay—and in all four the United States is well established, being supported by effective propaganda. However, British radio goods are always favourably regarded as quality products, especially in Argentina, and given competitive prices, supported by adequate sales literature, should be able to hold their own. Apart from the United States, Germany and France appear to be the most formidable competitors.

AUSTRALIA.—It is reported, says the *Electrical Review*, that over half the broadcast radio-telephone receiving licences issued in Australia are held in Victoria. It is estimated that approximately 300,000 licences are current throughout the country, the revenue from which must be at least £360,000 per year.

The Postmaster-General recently explained in the House of Representatives that the Government was anxious that all States should have the same facilities. In a short while it would be possible to relay one programme to the whole of the listeners in Australia, by which means alone people "outback" would receive a good service. The redistribution of "A"-class stations was necessary: one of these stations broadcasting on two wavelengths at the same time would cater for the same listeners on the same wavelengths as at present; on the second, and lower, wavelength it would serve a relay station, which would in turn supply listeners within its radius. Relay stations should be established by the companies, and close co-operation between them was the only way in which the whole of Australia could be well served. The Government would retain its control, and would govern the whole position. Therefore, no monopoly could possibly occur.

The Postmaster-General has been influenced by complaints of the unsatisfactory nature of many receiving sets sold in Australia, to suggest to the broadcasting companies and other controllers of wireless activities that they should establish a committee, whose task would be to test circuits, approve designs for sets, and grant the right to use a hall-mark, which in time would come to be regarded as a guarantee of excellence.

Australian papers state that the Deputy-Director of the P.M.G.'s Department has given them to understand that the research staff of the Post Office Department is investigating a scheme to establish a three-channel wireless service between Victoria and Tasmania. If possible, one channel will be used for telephone communication, and the other two for telegraph service.

The Sydney *Morning Herald* adds that the scheme is likely to cost about £50,000.

On April 19 Reuter's Agency reported from Melbourne that the *Argus* there had stated that: "The failure of the attempts to overcome 'fading' on the Canada-Australia beam service is regarded very seriously.

"The fading has been so serious that the contractors have found it impossible to submit stations for tests. Although it is expected that there will ultimately be an improvement, it is felt that major alterations to the beam stations may be necessary before a reliable service can be assured."

The London *Daily Telegraph*, commenting on this message at the time, added: "The phemonenon of fading is still something of a mystery to wireless experts, we are informed. Only two of the London beam services—those to Montreal and to Melbourne—are affected by it to any extent, and the immunity of the Indian and South African beams is believed to be due to the fact that they operate in a direction approximately parallel to the axis of the magnetic Pole. The Australian beam is subject to an average fading of three hours a day, round about 11 o'clock in the mornings, though the time varies according to the seasons.

Apart from the attraction of the magnetic Pole for "horizontal" beams, fading is believed to be caused by metallic areas, and by the attraction of large steel-constructed buildings. Experiments are being made to overcome the difficulty."

The Melbourne station (3LO) was granted a special licence to conduct a world broadcast on May 6 on a wavelength of 32 metres; the programme starting at 9.45 a.m., Melbourne time, and continuing at intervals until 5.45 p.m. In view of the success of recent world broadcasts, Amalgamated Wireless of Australasia, Ltd., has decided to provide a new powerful short-wave broadcasting station, probably at Sydney, to continue the service.

[From reports received from several reliable quarters reception was on that occasion below medium quality in this country.—ED., *T. & T. Jnl.*]

The Postmaster-General's report for the year ended June 30, 1927, indicates that the losses resulting from the working of the telephone and telegraph branches of his Department amounted to £339,000 and £278,000 respectively. According to the Melbourne *Argus*, a reduction representing £20,806 in the volume of telegram traffic is considered to be due in a great measure to the broadcasting of sporting results by wireless, although in Queensland the drought conditions prevailing throughout the year also affected the business considerably. An actual improvement of £38,761 in the telephone branch was converted into an apparent loss by the transfer from the telegraph branch of the responsibility of certain trunk lines used for both telephone and telegraph traffic.

According to the Australian correspondent of the *Daily Telegraph*, the cable and wireless telegraph traffic between Australia and the United Kingdom from April, 1927, to January, 1928, covering nine months after the "beam" system was started, totalled 11,740,000 words, of which the "beam's" share was 5,723,000, that of the Pacific cable 2,672,000, and of the Eastern Telegraph Company 3,345,000. The cables thus have the advantage of 294,000 words. The "beam's" percentage was 49 over all, but the traffic varied as follows in proportion in the different classes: full rate 29, deferred 40, Government 19, Press 42, deferred Press 62, week-end 63, daily letter 65. The cables thus retain the greater proportion of the more profitable commercial traffic.

AUSTRIA.—By the time this reaches our readers the new 60-kw. Rosenhügel station should be ready. *World Radio* considers that steady work will now be a feature of this station. Its wavelength is 517.2 metres and the new station has been skilfully erected without disturbing the former plant, which, it is understood, will be removed to Graz.

Negotiations are proceeding between Ravag, the Austrian broadcasting authority, and the Fultograph Company for the regular transmission of pictures during the radio year beginning in the autumn, Ravag is satisfied of the capacity of the Fultograph, says *World Radio*, but wishes to retain the utmost freedom as regards tests with other systems, at is own discretion.

BELGIUM.—A curious situation has arisen in Belgium, according to the London press, in connexion with certain long-distance wireless communications and the bi-lingual difficulties of that country.

Because Belgians are divided into two clans, Flemings and Walloons, each of which insists on its right to employ its own language, Flemish and French, the Government wireless stations dealing with long-distance commercial traffic, mainly with America, may have to close down temporarily, says the *Daily Mail*. The transmitting post is at Ruysselede, near Ghent, and the receiving station at Liederkerke, near Brussels. These villages are both in Flanders and according to the provisions of the Language Law, the wireless operators employed there must be able to speak Flemish. At the last Government examinations no Fleming was successful in obtaining his radio-telegraphist's certificate, so it was proposed to fill the vacant posts with qualified non-Flemish-speaking Walloons; but the administration could not agree because such a course would infringe the terms of the law. The director of the wireless service has therefore had to reply that the only alternative is to close the stations until Flemish specialists are available.

CANADA.—Reuter's Ottawa agency reports that it was announced in the House of Commons on April 12 that in view of the increasing complications caused by independent broadcasting the Government was considering the question of adopting national broadcasting along the lines which are in force in Great Britain.

The *Electrical Review* learns that: "Two Toronto stations will not be heard again, the Radio Branch, Department of Marine and Fisheries, having informed CJYC and its "phantom" CKCX that their licences would not be renewed during 1928-29. CJYC, the Universal Radio Company, leased its time to CKCX, the International Bible Students' Association, whose programmes were objected to by listeners, thus causing the Department to cancel all their licences from coast to coast. Their stations in Edmonton, Saskatoon, and Burnaby, B.C., will not be 'on the air' this year, unless political action is taken in their favour, says *World Radio*, which explains that the cancellation resulted in a general re-allocation of wavelengths. CFCA, the pioneer station of the Dominion, remains on its original wavelength of 356.9 metres; CNRT and CKOW, two 'phantoms,' will use station CFCA; CKCL and CKNC will occupy the 516.9-metre band, sharing time, and CHIC, a phantom of CKNC, will also be found on that wavelength; CKGW, the recently-opened 5-kw. station, will share time with CFRB on 312.3 metres. Toronto was added to the eastern chain of stations operated by the Radio Department of the Canadian National Railways on May 1, so that the chain now includes CNRQ, CNRM, CNRO and CNRT—Quebec, Montreal, Ottawa and Toronto respectively.

CHINA.—*Phototelegraphy.*—Because of the lack of symbols in telegraphy corresponding with Chinese characters, it has hitherto been necessary to code messages into figures for transmission and to decode them at the receiving end. However, now that a service of picture telegraphy (the Bélin system) is in use between Peking and Mukden, according to *World Radio*, addressees receive phototelegrams of the original messages. If anywhere in the world this system of telegraphy should come as the greatest of boons, surely it is in China.

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FRANCE.—A kind of dictaphone, which, adjusted to an ordinary telephone receiver set, will record phonographically any desired conversation and reproduce it faithfully afterwards, at will, is being issued to French telephone subscribers through the Ministry of Posts and Telegraphs.

The apparatus, says the London *Daily News*, is simple in design and inexpensive and can be installed without affecting the ordinary use of the telephone. It is expected to prove serviceable to business men wishing to preserve records of important calls.

The Paris correspondent of the *Daily Telegraph*, towards the close of last month, reported that a new world's record in wireless telephony had been established by Lieutenant Jouy, of the technical branch of the Air Department, who, in order to test a new system of radio equipment for aeroplanes, made a tour of France, flying from Paris to Dijon, Lyons and Strasbourg and back to Paris without for one moment losing touch with the land stations.

Before this test the record for communication by wireless telephony between an aeroplane and a land station stood at 125 miles, but he has proved that it is possible over a distance of about 250 miles. At any time during the flight the pilot could have been given his exact position by a land station.

La Interligilo de l'P.T.T., edited in France in Esperanto, terminating with its April number has been presenting its readers with a *résumé*, in this well-known artificial language, of Lt.-Col. W. T. Brain's lecture on the London Postal Service given before the London T. and T. Society and published, it will be recalled, in Nos. 147-149 of this journal—last year. This comes as a special compliment from an international organisation representing the postal, telegraph and telephone services of so many different countries.

GERMANY.—Reuter's Coblenz Agency reports that steamboats passing up and down the river Rhine, either for commerce or pleasure, have hitherto been precluded from the use of wireless while passing through Occupied Territory. This prohibition has now been partially removed, and permission to own and operate receiving sets has been accorded ; owners must, of course, comply with the German Government regulations governing the use of wireless apparatus.

In Germany there are 248,198 fewer subscribers to the broadcasting service than in England, the respective totals at the end of March, 1928, being 2,482,930 in England and 2,234,732 in Germany ; Germany's increase since March, 1927, was 599,004.

The completion of the relay station at Flensburg will increase the number of broadcasting stations in Germany to a total of 25.

The German Cable Works Co., Berlin, which for the first time for 25 years is unable to pay any dividend, states that the hopes entertained when the capital was doubled to 10,000,000 marks, were not justified. The net profit was 30,000 marks, as compared with 381,000 marks in 1926. The unsatisfactory results are attributed to unforeseen expenses in connexion with an order for 222 km. of long-distance cable with Pupin coils. In the export market conditions were very difficult owing to keen international competition.

GREAT BRITAIN.—*Parliamentary Queries.*—On April 24 Mr. Day asked what would be the individual cost of the three wireless "beacons" which were being erected at the Caskets, Lundy and Start ; when was it expected that they would be in operation ; and whether it was proposed to erect any further wireless beacons around the coast.

Sir P. Cunliffe-Lister said he was informed by the Trinity House that the estimated cost of the wireless beacons at the Caskets and Lundy would be about £4,000 each, and at Start about £3,500, and that the signals at the Caskets and Start would be in operation in about four months, and that at Lundy in about six months from the present time. Sanction had been given to the erection during the current financial year of further beacons at South Bishop, Dungeness and Cromer in England and Wales, and at Sule Skerry and Kinnaird Head in Scotland, and it was expected that sanction would shortly be given to two others in Ireland.

On April 19 Sir W. Mitchell-Thomson informed Sir Charles Wilson that he had received no application from the British Broadcasting Corporation for permission to proceed with the erection of a regional station in the North.

On April 24 Mr. Day asked the President of the Board of Trade whether any decision had been arrived at by his Department, in conjunction with the Air Ministry and Trinity House, with reference to the question of establishing an experimental station for the purpose of investigations into the wireless loop direction-finding system.

Sir P. Cunliffe-Lister said that the question was still under consideration, but he hoped that a decision would be reached on it very shortly.

On April 30 Mr. Day asked whether the preliminary trials of the rotating loop direction-finding system investigated by the Department of Scientific and Industrial Research had proved satisfactory ; whether it had been decided by the Board of Trade, in conjunction with the Air Ministry and Trinity House, to establish an experimental station of that type ; and, if so, where that station would be established.

Mr. H. G. Williams said that as the result of the preliminary trials of the rotating loop system (a report on which, he understood, would be published shortly by the Department of Scientific and Industrial Research), it was proposed to erect an experimental station at Orfordness for air and marine navigation which could be tried under service conditions. The arrangements were not yet completed.

On May 1 Mr. Baldwin, the Prime Minister, informed Mr. W. Baker that no report had yet been submitted by the Wireless and Cable Conference. It was not, therefore, possible for him to say anything with regard to its publication. No offer had been made direct to the Government with regard to the purchase of the whole means of Imperial telegraphic communication. He understood that certain suggestions in this connexion had been laid before the Conference, and were still under consideration by that body.

On May 2 Mr. W. Baker asked the Postmaster-General whether he was aware that complaints of interference by morse from the new station at Portishead were being made in that area ; whether his engineers had conducted experiments in the endeavour to eliminate the nuisance ; whether he was aware that the adoption of the British Broadcasting Corporation's suggestion that a coupled circuit should be used had failed to give satisfactory results ; and whether he would give the matter attention so that a remedy might be found.

Lord Wolmer, Assistant Postmaster-General, said that complaints of interference with broadcast reception by transmissions from the wireless station at Portishead had been investigated by Post Office engineers, and it had been found in many cases that the use of a loosely coupled receiving circuit had practically eliminated the trouble. The use of a frame aerial was also of material assistance in this respect. It was difficult to avoid some interference with broadcast reception in the vicinity of a wireless station ; but the Post Office engineers would continue their investigations with a view to assisting listeners to adapt their apparatus so as to eliminate interference from the Portishead station.

A day or two before these pages went to the printer the following questions and answers were also exchanged between the Prime Minister and certain members of the House of Commons :—

> Replying to Mr. W. J. Baker, Mr. Baldwin said it was not possible to forecast when the report of the Imperial Conference on Cable and Wireless Services would be available. He understood that the deliberations of the Conference would not be concluded for some time, but as soon as he was able to do so he would make a statement.
>
> Mr. Snowden asked for an assurance that nothing definite would be done until the report of the Conference had been published.
>
> Mr. Baldwin : I require notice of that.
>
> Mr. Snowden : In view of the importance of the matter and the public interest taken in it, will the Prime Minister afford an opportunity for debate ?
>
> Mr. Baldwin : As soon as we get the report we will have a debate. I have always been prepared to afford opportunities for a debate, but until the report is received it will be very difficult to debate the matter.

During the second week of last month the B.B.C. experimented with a new tuning signal from 2LO as a prelude to the time signal of six "pips." The new note (the chord of C major) was produced by tuning forks and sounded continuously, "having the effect," reports one scientific weekly, "of a steamship's siren."

In the latter verdict we may be permitted to differ from that particular scientific opinion. From the writer's experience of ships' sirens, the B.B.C. note was quite sweetly musical, if somewhat unsteady at moments.

The *Daily Telegraph* publishes the following interesting suggestions put forward by Mr. H. A. Hankey, Overseas Secretary of the Wireless League, regarding the financing of Empire broadcasting. Mr. Hankey has returned from visits to South Africa and Australia.

"In Australia it was proposed to him by competent broadcasting authorities that the capital and part of the income required should be raised by an addition of 6*d*. to the Australian licence fee. Mr. Hankey suggests that a central station should be erected at Canberra, and the revenue augmented by various Imperial organisations having the use of the service for propaganda purposes daily.

"In Great Britain he advocates an addition of threepence to the receiving licence fee, which would be sufficient to provide a station. The programmes, he proposes, might be provided free by the British Broadcasting Corporation, and the revenue supplemented by the means suggested for Australia. It will be recalled that the existing Empire station at Chelmsford, 5SW, is purely experimental, and the British Broadcasting Corporation has not undertaken to maintain it indefinitely. In South Africa, where there are relatively few listeners, the cost of an Empire station would have to be borne by the Government.

"A permanent Empire broadcasting service will have to be on a reciprocal basis. That is to say that Australia will supply Britain with programmes in return for those broadcast from Britain to Australia."

Although in the Australian news, above, it was recorded in London that on May 6 the special transmission of the Melbourne 3LO was not heard any too distinctly on that date, on Sunday, April 22 the following account is vouched for by the *Daily News*, when highly successful reception was obtained.

"Several people," says our informant, "sitting in a saloon car fitted as a wireless receiving station in Lincoln's Inn Fields on Sunday night heard Melbourne City clock striking six o'clock Monday morning, just after the London clocks had chimed nine (British summer time).

"The experiment was carried out by the Australian Press Association, assisted by Mr. C. G. Allen, of Belvedere, Kent. A six-valve supersonic receiver was placed in the car, with an aerial of about 8 ft. of copper trolley wire used by electric trams rigged to the top of the car. The earth wire was connected to a grease nipple on the motor-car frame.

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"Mendelssohn's 'Spring Song' and Handel's 'Largo' were heard at full loudspeaker strength, with little or no atmospheric interference, and the news announcements came through perfectly."

The Postmaster-General has sanctioned the erection of the first of the new high-power twin-wavelength stations contemplated by the British Broadcasting Corporation in its regional scheme. The new station will be in the north of London. Work will begin shortly on its construction, and it is anticipated that the station will be opened for service within from twelve to fifteen months' time. It may be added, says the *Electrical Review*, that tests have been carried out on a site on high ground between Potters Bar and Hatfield, near to Kentishlane Farm, Woodhall.

Battery Eliminators.—The extended and extending use of battery eliminators for use with wireless apparatus is causing both private and public electricity corporations some disturbance of mind. The electrical engineer of the Bangor Corporation has reported that several electricity consumers are using h.t. eliminators for wireless purposes connected to their domestic mains and the Bangor Council have decided "not to approve of the connexion of h.t. eliminators to electricity consumers' installations unless they conform to the electrical engineer's requirements in certain technical matters, and *unless the consumer using them gives a written undertaking that the Corporation will not be called upon to change d.c. types for a.c. types when the system is changed over.*"

The italicised clause, of course, refers to the coming co-ordinating electrical distributing scheme for this country, now in progress.

Upon other and more serious grounds, especially to the radio licensee, was the report of the engineer of the West Hartlepool Town Council, who said that "during a recent survey of electrical apparatus on consumers' premises he found certain designs of direct-current radio battery eliminators, 'the use of which was fraught with great danger' in the case of the employment of headphones. In his opinion the attention of the public ought to be drawn to the risk which it was running by the use of those eliminators.

The Chairman of the Committee took up the position that there were satisfactory eliminators which were perfectly safe, but the very cheap varieties used waxed paper for insulation and in other ways were not adequately protected. The Corporation had power to refuse to connect unsafe apparatus, and when it changed over its distribution system from d.c. to a.c. it would not replace, or pay compensation for, apparatus which should never have been used on the mains.

All that appears to be necessary to add to any who may be interested in utilising this means of obtaining the necessary power for wireless apparatus in the home, is that "low-priced articles are seldom really cheap" and "a word to the wise is sufficient."

Clacton-on-Sea is now to be added to the towns where the Radio Exchange system is being adopted for the distribution of wireless broadcast programmes. It is known as the Clacton-on-Sea Broadcast Relay Service, and from a central receiving station there stretches to houses all over the district a single wire, and from morn till midnight there is a programme available, and all for 1*s.* 6*d.* a week and a Post Office licence of 10*s.* a year.

The service operates under Marconi licence and conforms to the local bylaws where the wire to a house has to cross a road. Two expert engineers are being paid £500 a year each to maintain the service.

The difficulties of wireless reception, apparently unforeseen, which were at first experienced at the London Air Port, Croydon, in connexion with the new control tower in the enlarged aerodrome at Waddon where it was impossible to receive, although the transmission direction presented no difficulties, was found to be due, says Major C. C. Turner, the Aviation correspondent of the *Daily Telegraph*, to "the immense quantity of iron wire embedded in the ferro-concrete" producing at best 'unsafe' reception. It is now stated that, "after searching tests, in which aeroplanes flew round and round the vicinity, the amount of error in all circumstances was defined, and arrangements made to overcome the difficulty. The Air Ministry is satisfied that the installation is now working accurately and that information can instantly be given to aircraft."

According to the *Electrician*, at an informal meeting of the Institution of Electrical Engineers on April 16 Mr. M. Whitgift in the Chair, Mr. E. H. Shaughnessy opened a discussion on "Wireless Reception," and dealt with this subject from an unfamiliar aspect. "He spoke," says our contemporary, "from the point of view of a telegraph engineer in opposition to that of the broadcasting man and he asked for more consideration for the important and essential telegraph and telephone services from a spoilt public indulging in more or less musical and other broadcast entertainment. He frankly declared for spark transmission in preference to the interrupted continuous wave, and complained of the monopoly, by broadcasting, of the ether which has become so crowded on the long-wave system, that the G.P.O. have had to put their stations 200 cycles apart.

Mr. Shaughnessy also said the first effort in wireless reception was to try to eliminate noises, but the most highly selective apparatus yet produced seemed to diminish the quality of reception."

The National Radio Exhibition for 1928, organised by the Radio Manufacturers' Association, will again be held at Olympia, London. The date of the Exhibition is fixed from Saturday, Sept. 22 to 29, and will be closed on Sunday.

"The selling of apparatus to the public," states the *Electrician*, "will again be allowed, though, as in previous years, the actual demonstration of receivers or loudspeakers is confined to areas outside a quarter-of-a-mile radius of Olympia, London, where the exhibition will be held."

Interesting Items to Read.—"Radio Signal Fading," paper read before the Wireless Section of the I.E.E. by Prof. E. V. Appleton, F.R.S.

"Photo Electric Cells," by Dr. J. A. Fleming, F.R.S., in May issue of *Television*.

"Modern Atlantic Cable Operation," by Commander Rollo Appleyard, R.N.V.R., M.I.C.E., M.I.E.E., in the *Electrical Review*, No. 2631, April 27, 1928.

HOLLAND.—The *Electrical Review* informs us that the times of transmission of the 30-metre Dutch station (PCJJ) of Messrs. Philips Lamps, Ltd., have been modified. Until further notice it will operate on Tuesdays and Thursdays from 16.00 to 20.00; on Fridays from 23.00 to 02.00 (Saturday); and on Saturdays from 15.00 to 18.00 G.M.T.

We have also been informed that because of interference the wavelength of P.C.J.J. has been changed from 30.2 metres to 31.4 metres until further notice.

HUNGARY.—The opening of the Budapest Radio Spring Trade Fair on April 28 was chosen as the date of inaugurating the new 60-kw. station, the special identification signal of which is a chime. It is run by a private company, but is controlled in close association with the official Press Bureau.

The British Government's Commercial Secretary at Budapest informs the Department of Overseas Trade that the development of wireless in Hungary proceeded during 1927, although not very rapidly. The new station (which commenced operation on April 29) is expected to result in a considerable increase in the use of crystal receivers. At present about half the sets in use in Budapest are crystal receivers, whilst the remainder and practically all sets in use in the provinces are of the valve type. At the end of 1927 the number of receivers used in the country districts was 38,004 and in all towns 45,310, representing 54.5 sets per 10,000 inhabitants in country districts and 287.8 sets per 10,000 inhabitants in towns, the highest figures being for Budapest (40,408 instruments, 435.6 sets per 10,000 inhabitants.

IRISH FREE STATE.—In Dail Eireann on April 25 the Minister for Finance stated in his Budget statement that at the present time the maintenance of the telegraph service involved a substantial annual loss, and there was no prospect of its becoming self-supporting. On the contrary, as telephony came into more general use, telegraphy would decline. To a certain extent falling traffic would make possible reductions of staff, but on the whole the tendency would be for the difference between income and expenditure to widen. The service must be retained, and the only way of reducing the deficit, and preventing the burden on the Exchequer from growing, was by increasing the tariff. They proposed to raise the minimum rate for ordinary telegrams to 1*s.* 6*d.* each, but even then each message sent would still involve a contribution of about 6*d.* for the Exchequer. The loss to the Post Office at present, after allowance was made for services rendered by it to the other Government Departments, was about £400,000 per annum. A great proportion of the telegrams handed in were of a sporting nature, and not such as could very strongly claim a contribution from the ordinary taxpayer towards the cost of their transmission, and the increase proposed was not likely to affect appreciably the course of business in the country. It would produce £66,000 this year and £70,000 in a full year.

ISLE OF MAN.—There was a mysterious interruption of the Isle of Man cable with the mainland recently and the British Post Office engineers subsequently ascertained that a picnic party had accidently built a camp fire on the cable at the Isle of Man end of the line.

The cable had been exposed by the recent heavy tides, and was actually burned through to the core.

LAPLAND.—The extent to which long-distance telephone speech is now-a-days being extended and the one-time "insuperable" difficulties which are now overcome in connexion with wire telephone circuits, cannot be better exampled, perhaps, than by the opening of the Geneva-Kiruna, Upper Lapland (Sweden) telephone circuit on April 28, 100 miles north of the Arctic Circle. The new circuit, states the *Electrical Review*, consists of 2,530 miles of double wire, includes 1,125 miles of underground cable between Geneva and the Baltic coast at Stralsund, 100 miles of submarine cable between Stralsund and Malmö, and 1,305 miles of overhead wire between Malmö and Kiruna.

NEW ZEALAND.—The number of licensed listeners is now 40,000, compared with 21,000 at the end of June, 1927. The Broadcasting Co. is receiving at the rate of £55,000 a year.

A number of Auckland citizens have united to erect a 1-kw. station for the use of persons or societies having matter of general interest to the public to broadcast. The organisation is known as the Te Pono Radio Association, and, according to *World Radio*, it will be a non-dividend-paying concern run for the benefit of the community. The Government has granted permission for the erection of the station, and the Association announces that a large proportion of the capital is available.

NICARAGUA.—Reuter's Trade Service, Managua, reports that the President of Nicaragua has approved of a contract between the Government and the Tropical Radiotelegraph Co. (a subsidiary of the United Fruit Co., of Boston) for a regular radio-telegraph service between the interior of the Republic and the Department of Bluefields, which contains the principal port of entry on the Atlantic coast, and through which 75% of the import and export trade passes. A large transmitting station has been erected

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by the Company, which has also built similar stations in several Central American countries and the West Indies.

The Company will shortly erect at San José, Costa Rica, another station to broadcast official, commercial, scientific, meteorological and other news, is the further information received from the same agency, but from their San José branch. When this station has been completed the Company will have spent nearly £800,000 on its radio building programme, including the installation of valve transmitters for both telegraphy and telephony purposes on all the ships of the United Fruit Co., enabling passengers to talk from their cabins with the shore at any time during the voyage.

POLAND.—It is stated, both by the financial and technical press in London, that the decision of Marconi's Wireless Telegraph Co., Ltd., to begin the manufacture of wireless apparatus of all types in Poland is due partly to the difficulty experienced by the Marconi works at Chelmsford in coping with the flow of orders from all parts of the world, and partly to enable the country to develop trading operations in Eastern Europe. The orders received during the first three months of 1928 for execution at the Chelmsford works exceeded the orders received during the same period of 1927 by 20%.

SOUTH AFRICA.—It is reported from Johannesburg that part of the plant for the erection of a new station has arrived in accordance with the plan formed when the African Broadcasting Corporation took over the present station. The new set will feed 15 kw. into the aerial and provide much better broadcasting for the Rand, Pretoria and the rural district. The present JB set will probably be removed to Bloemfontein.

SPAIN.—Work has recently been commenced near Madrid on the erection of a new wireless-telegraph station, which the Sociedad Argentina is establishing to provide a direct service between Spain and the South American Republics. The station is being designed for the simultaneous transmission of one telephone and two telegraph messages.

SWEDEN.—In a report by Mr. H. Kershaw, O.B.E., Commercial Secretary, at Stockholm, to the Department of Overseas Trade, among other interesting matters the following reference is made to the radio industry: "The business in radio apparatus is said to be satisfactory. The tendency to purchase parts has given place to the buying of complete sets, and there has also been a change-over from crystal to valve receivers. Most of the sets are of Swedish manufacture, but a great deal of German apparatus is imported. There is a tendency towards an increased demand for high-quality goods. British manufacturers are urged to study the Swedish market more closely and to give the greatest consideration to the reports of representatives who have visited the country."

SWITZERLAND.—The proposal to erect a radio-telegraph station for the League of Nations at Geneva, at an estimated cost of £50,000, with annual working expenses of £8,000, is to be considered by the Council and the Assembly of the League in September next. The committee believes that at least 1,200,000 words would be distributed annually from the station. The yearly receipts during the first few years are estimated at between £4,000 and £5,000.

U.S.A.—We have seen wireless sets associated with motor-cars as a source of enjoyment, well out in the country, by the wayside, but *The Times Engineering Supplement* correspondent in New York gives it as a fact that the increasing competition among motor-car companies has necessitated the introduction of new devices of salesmanship. One of the schemes which has brought hundreds of people into motor-car salesrooms is the installation of receiving sets to give the detailed reports of a big prize-fight or a much-advertised broadcasting of a dramatic or musical programme!

The Central News New York correspondent considers that it is unlikely that the American public will be overburdened with public speeches by wireless during the Presidential elections this year.

Forty-five shillings per second is the estimated cost of broadcasting a political speech *throughout* the United States of America. Minimum time of broadcast, one hour. Minimum charge, £8,000!

On the 14th ult., according to the Exchange Telegraph Company, in the House of Representatives the American Telegraph and Telephone Co., and also the Mackay system, appeared before the Federal Radio Commission and asked for additional short-wave facilities. They outlined plans for important extensions of radio telegraph and telephone communications from the United States to Europe, South America and the Far East.

Mr. Frank B. Jewett, Vice-President of the American Telegraph & Telephone Co., asked for three more channels to Europe to take the increased radio telephone business, and also asked for one channel to South America. He explained that the company proposed to open a radio-telephone service to Argentina, from which, through land wire connexions, such service could be extended to other South American countries.

Mr. Charles E. Hughes, junior counsel for the Mackay system, told the commission that the Mackay Company plans to open a radio telegraph service from Paloalto (California) to Honolulu, Guam, the Philippines, China, Japan, Australia, Dutch East Indies and Indo-China. The first link between Paloalto and Manila is expected to be in operation by the first of the present month.

He added that the Mackay Company had acquired control of the Sayville (Long Island) wireless station, and he asked for frequencies which would permit a radio service to England, France, Holland, Spain, Portugal, Egypt, the Republic of Georgia, Colombia and Venezuela.

Representatives of the radio corporations of America told the commission that they proposed to open wireless telegraph circuits to Liberia, Cuba, Chile and Brazil, and also contemplated the establishment of a service to Japan, China, South Africa, Spain, Russia, Czechoslovakia, Switzerland, Syria, Australia and New Zealand.

Many of us have generally associated the photo-electric cell solely with the development of television systems, and undoubtedly it plays, and must continue to play, a fundamental part in that science. The Bell Telephone Laboratories, however, in their investigations into the behaviour of the magnetic materials which play so important a part in the telephone and its development, had occasion to measure the minute changes in length which occur in magnetisation, and were compelled to invent some new device which would enable them to indicate the most minute changes in length. Such an apparatus, to measure lineal changes as small as 0.000000001 inch, has actually been constructed by utilising the property of a photo-electric cell, which, as we know, gives off a current proportional to the light falling upon it.

The income account of the Western Union Telegraph Co. for the year ended Dec. 31 last, records gross operating revenues of $131,771,003 and a net income, including $2,689,814 dividends and interest, of $18,614,784. After deducting $3,584,331 bond interest, a balance of $15,030,453 is carried to surplus account. That account shows a surplus brought forward of $71,404,042, and the addition of the balance on income account (after adjustments) makes $86,509,368. Dividends absorbed $7,980,786, leaving a surplus at the end of the year of $78,528,582. The report mentions that substantial reductions were made in the rates between the United States and South American points and in Press rates between New York and Great Britain. It is considered that the development of radio communication has actually been of advantage to the cable systems, and cables are stated to be still the better method of communication. A decline of 2% in operating revenues was more than compensated for by a decrease of 2½% in the working expenses.

The gross revenue for the first quarter of the *current* year was $32,066,325 (against $32,065,195 for January-March, 1927). The total expenses rose from $27,926,636 to $28,273,920, and the net income was reduced from $3,241.093 to $2,893,254.

Personal and other items.—"Automatic Telephony Simplified," by C. W. Brown, which first appeared in the *T. & T. Journal* as a series of articles on automatic telephony, can now be obtained for the price of 6*s*. from Messrs. Pitman & Sons, Ltd., London. Perhaps those Continental correspondents who so kindly enquired regarding the possibility of obtaining a bound copy of the articles will note and communicate direct with the publishers as above.

Mr. John Gardner, the inventor of a typewriter, the first back-pedalling brake for a bicycle, and what concerns these columns more specially, the first wireless-control automobile torpedo, passed away at Bolton-le-Sands, Lancs, last month, at the age of 65 years.

One has also to record with great regret the death of the veteran Capt. Lewis Hoad, at Gibraltar, on April 15, aged 74 years. He was in command of the Telegraph Construction & Maintenance Co.'s cableship "Telconia." He joined the company as second officer of the c.s. "Calabria" in 1896, subsequently being appointed master of the "Seine" in 1904, the "Colonia" in 1905 and the "Telconia" in 1909. It is interesting to note that, at the time of Capt. Hoad's birth, less than 500 miles of submarine telegraph cable had been laid (the first cable having been laid from Dover to Calais in 1850, only four years before his birth). At the time of his death no less than 340,000 miles had been laid by the company in whose employ he was.

Towards the end of the last month I took advantage of an eighteen months' old invitation and visited the works of Messrs. Creed & Co., at Croydon, where, needless to say, I was immediately conscious of that atmosphere of kindly feeling with which the Creed brothers seem always to be surrounded. Of the visit itself, possibly more anon, but I found the elder brother sternly endeavouring to cope with the correspondence arrears of four months' absence, due to a business visit to India, plus the superintendence of the nuptials of his youngest daughter.

The relations between the Telegraph Department and the A.G.D. have always been of a most cordial nature and it is to such individuals as Mr. F. Strong, whose promotion is noted with intense pleasure by all who have had direct contact on the International Cables and Wireless side with that hard-working individual, that much of that goodwill is due. One is sure that no invidious interpretation will be placed upon these remarks, but who could refrain from expressing one's admiration for, perhaps, the only accountant who, when engaged on an official visit to a foreign country, was met at the railway station and escorted by a brass band to his hotel!

The best wishes follow an old colleague in the person of Mr. T. G. Beavis, Supt. Higher Grade, C.T.O., into retirement, though he was "*Staff*" Superintendent may he not need one upon which to lean for many a long day!

The Universities and Business Life.—Nothing will ever take the place of the placid opportunities that the life of a university affords; to be most truly distinguished, the individual must have room for all-round growth; an untimely rush into buying and selling blunts the finer susceptibilities, and dulls the due appreciation of the nice balance that must ever exist between the rights and the duties of every human being. If it is objected that we have written of ideals when the immediate problem is the recovery of industry, we will answer that where there is no vision, the people perish.—The *Electrical Review*.

J. J. T.

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Where Strowger Autor

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In the transmitter testing device shown below, two transmitters are mounted on the two standards, and comparative tests are made upon them.

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BY means of the transmitter comparison device illustrated, the performance characteristics of transmitters may be studied. Comparison by the sense of hearing alone is supplemented by the readings of the delicate measuring instruments, giving the investigator a clear indication of the operative qualities of the transmitter being tested. By its use, an engineer can make a detailed study which yields a better understanding of the transmitter and contributes largely to the consistency of performance of factory-made apparatus.

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The
Telegraph and Telephone Journal.

PUBLISHED MONTHLY IN THE INTERESTS OF THE TELEGRAPH AND TELEPHONE SERVICE, UNDER THE PATRONAGE OF THE POSTMASTER-GENERAL.

Editing and Organising Committee - - - J. STUART JONES. W. D. SHARP. J. F. STIRLING. W. A. VALENTINE. J. W. WISSENDEN.

Managing Editor - - - W. H. GUNSTON.

NOTICES.

As the object of the JOURNAL *is the interchange of information on all subjects affecting the Telegraph and Telephone Service, the Managing Editor will be glad to consider contributions, and all communications together with photographs, diagrams, or other illustrations, should be addressed to him at the G.P.O. North, London, E.C.*1. *The Managing Editor will not be responsible for any manuscripts which he finds himself unable to use, but he will take the utmost care to return such manuscripts as promptly as possible. Photographs illustrating accepted articles will be returned if desired.*

VOL. XIV. JUNE, 1928. No. 159.

BEYOND THE PILLARS OF HERCULES.

AFTER many rumours and premature announcements in the Press, telephone service between this country and Spain was actually opened on May 24. This marks an extension of the Anglo-Continental service in a new direction, Spain being the first so-called Latin country outside France to obtain a regular public service with this country. Recent extensions have reached the Baltic and the Arctic circle, they have followed the Danube from Ratisbon to Vienna, and from Vienna to Buda Pest, and the Elbe from Saxony into Bohemia; but they have not crossed the Alps nor had they until last month reached the other side of the Pyrenees.

The service is afforded by means of a through circuit between London and Madrid without intermediate switching. It is carried by underground and underseas cables to Paris, and thence in the form of a carrier wave circuit on the French overhead route to the Spanish border, whence the newly constructed routes of the National Telephone Company of Spain carry it to Madrid. Our readers are aware, from the article which we recently published of the modern exchange systems and extensive trunk line networks which have been provided by that Company in Spain. These networks embrace circuits to Portugal and to Ceuta on the African shore of the Straits of Gibraltar, and it is probable that communication between this country and Spanish Northern Africa as well as Portugal and Gibraltar will be realised in the near future. Indeed, as we go to press we learn that services to Lisbon and Gibraltar will be inaugurated early in June.

There is an undoubted fascination in watching the gradual spread of the overseas telephone services from country to country. Indeed, our ambitions are no longer bounded by Europe but now extend to new continents. By the aid of the radio-link we already obtain speech with Vancouver and San Francisco on the Pacific Coast, and when we have a regular service to Ceuta, we shall have only Asia to conquer of the four continents into which the world was divided in the old geography books. In another column we make reference to a call made from London, via Amsterdam and a short-wave circuit, to Java 7,000 miles away, and though this was effected by special arrangement and does not portend the early provision of a public service between this country and Asia, it seems to point the way to the means by which the first regular communication with that continent will be obtained.

HIC ET UBIQUE.

WE offer our congratulations to Lieut.-Col. A. G. Lee, O.B.E., M.C., whose portrait, with a short biographical sketch, appeared in our last issue, on his appointment to the post of Assistant Engineer-in-Chief in place of Mr. J. Sinnott, O.B.E., retired.

The annual report of the American Telephone & Telegraph Company shows that the company's system developed as follows during 1927 :—

	No. of Telephones.	*Increase.*
Bell Companies (Manual) ...	11,175,886	334,756
,, ,, (Dial) ...	2,550,170	575,048
Bell-Connecting Companies	4,639,430	—118,570
Total telephones ...	18,365,486	791,234

The number of exchanges, 6,115, shows an increase of 117. The miles of exchange-line wire total 49,279,379, and the miles of toll (i.e. trunk) wire 7,543,516. The number of companies connecting with the associated companies of the A. T. & T. Co. is 8,892.

We have received a copy of the balance sheet and statistics of the Guernsey States Telephone Department. Their telephone stations increased during 1927 by 189, to the total of 4,054, and their total subscribers' calls to 2,504,007. Their gross revenue was £18,578 and their net profit £796.

On May 16 the Anglo-Danish Telephone Service was extended to all places in Denmark. On the 24th of the same month a service was opened between Great Britain and Spain, which will probably be extended to Portugal and Gibraltar early in June.

The charge for a 3-minutes' day call between London and Madrid is 14*s.* 3*d.*, between London and Barcelona or Bilbao 12*s.*

A telephone call was successfully put through from London to Java, 7,000 miles distant, on May 10, when Mr. Ormsby-Gore, Under-Secretary for the Colonies, who is in Java, spoke from Bandoeng to the Colonial Secretary in his room at the House of Commons and to his wife, Lady Beatrice Ormsby-Gore. The Anglo-Dutch telephone circuits were employed between London and Amsterdam, whence communication was continued to Java by short-wave wireless.

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The conversion of the Budapest Telephone Service to automatic working began in April, according to the *Manchester Guardian*, when 2,500 subscribers were to obtain automatic connexion. By the end of June, 25,000 telephones will have been adapted to automatic working, and the change-over of the whole of the Budapest service, it is said, will be completed in the next year or two.

According to a story from New York, retailed by the *Glasgow Herald*, apparently the telephone-user in the United States suffers from much the same grievances as in this country. The story illustrates both the trials which beset the long-distance caller and the inter-urban amenities with which we in this country are not unfamiliar. A Chicago merchant, after putting through a business deal in New York tried to get his office on the telephone, and was promised that the call would go through at once. After the first half-hour he ventured to express the hope that communication would be established without much more delay, but after the second half-hour he more or less angrily expostulated with the operator. Argument developed, in the course of which the merchant scathingly expressed his strong conviction that in his home town, Chicago, a call could be put through quicker to H——l. "Yes," came the ready answer, "but that's within city limits."

As from April 29 the Transatlantic Telephone Service has been open from 11.30 a.m. to 2 a.m. (British Summer Time) —extending the former hours of service by 2 hours.

"The language of many telephone subscribers," says the *Sunday Pictorial*, "is quite uncalled for," says an official. So are many of the numbers.

This, we may add, is the first "wrong number" joke possessing any claim to wit which we have seen.

We learn from the Australian Postmaster-General's report that the service between Melbourne and Sydney has become so popular that it is proposed to replace the present three-channel system, which permits of the transmission of five messages, telegraphic and verbal, simultaneously, to a system which will enable eight simultaneous conversations to be carried on. These facilities will probably be in operation before the end of the year. Two additional channels will shortly be provided between Sydney and Brisbane, and the line between Melbourne and Adelaide has recently been reconstructed. When all the improved facilities are in operation it is anticipated that satisfactory conversation will be possible over a distance of 3,000 miles between Adelaide and Cairns. Investigations are proceeding for the linking of Adelaide and Perth by a direct trunk-line, and progress is being made in North Queensland.

CIVIL SERVICE DRAMATIC SOCIETY.

A PROGRAMME of social events is being arranged during the forthcoming season in order to stimulate a great intimacy between members of the Society and the Civil Service generally.

These events will take the form of dinners, dances and lectures on dramatic art, and it is further hoped to institute a series of one-act plays, with the object of providing an opportunity for members of the Society to take part who are not cast for parts in the main production at the New Scala Theatre and to give trials to those whose talent might otherwise remain unexposed.

The Annual General Meeting of the Society will be held on June 11 next, at 5.30 p.m., in the Rehearsal Room, Ministry of Pensions, Sanctuary Buildings, S.W.1. All Civil Servants are cordially invited to attend.

Further particulars may be obtained on application to the Honorary Secretary, Mr. Percy W. Nash, 9, Palmers Road, East Sheen, S.W.14.

STAFF MEETINGS AND THEIR BEARING ON THE SERVICE.

BY A. E. COOMBS, GLASGOW.

IN the Autumn of 1924 it occurred to some of the officers attached to the Liverpool Traffic Branch that it might be a good thing for the service, and the staff, if a series of meetings could be held for the purpose of discussing operating problems, traffic and service instructions, and kindred matters, directly or indirectly, bearing on the efficiency of the telephone service.

It was felt that meetings such as these would :—

(*a*) tend to stimulate interest, particularly as to the basic principles underlying the supervision and manipulation of telephone traffic ;

(*b*) arouse personal as well as collective and official interest, and

(*c*) develop a wider and better understanding between supervising and supervised regarding the fundamentals of telephone administration, as expressed in the everyday operation of calls.

In the telephone service, as in everything else, to stand still, or to be self satisfied, is at once to progress backwards, therefore, efficient though our service was we were under no delusion as to its defects, nor as to where there was room for improvement. Particularly was this so in regard to the elimination of the waste effort represented by ineffective calls.

There was the further interesting point that, reading between the lines of some of the comments and criticisms which came under notice, the real purport of many official instructions seemed to have been missed, while in others the regulations concerned were being applied in mechanical manner, correctly perhaps in the letter, but not so in the spirit.

It was clear also that the need for accuracy in small matters was not always appreciated. Other reasons could be tabulated, but these would all boil down to the main thought that we should endeavour to make our service more efficient by a clear appreciation of why it should be so, rather than because it was a routine performance of a daily duty.

It remained, therefore, to interpret the idea in terms of action.

After due consideration we decided to hold the meetings between 9.30 a.m. and 12.30 p.m. and 2.0 and 4.30 p.m., Mondays to Fridays, subject to service exigencies, availability of staff, and other possible day-to-day disturbances.

It was further decided to begin the meetings as soon as the Summer Leave terminated. Winter Leave begins in November and, as a rule, the average number of officers then absent is not so high as during the Summer period. Normally, the additional force temporarily available is utilised for exchange records and clerical work—to bring these up-to-date—and, in the big Cities, to meet Christmas pressure, which generally begins in November, so far as telephone traffic is concerned.

Arrangements were made accordingly, and, by close co-ordination and the goodwill of all concerned, it was found possible to work out a margin of staff for the meetings without detriment to other essential duties. The number of staff available varied from day to day, and even during the day, but on the whole, our experience indicates that the period covered by November and early December is the best and probably the only time during which such a scheme as this can be carried out. Annual Leave arrangements are now standardised and vacancies occurring during the Winter Leave period are not normally filled until the approach of the following Summer period. The force available for special requirements is therefore a diminishing quantity from October to the following March.

After further consideration and again subject to availability of staff, the number of officers to attend each meeting was fixed at approximately ten Telephonists, one Sectional Supervisor, one or two Traffic Officers and, whenever they deemed it necessary and could get away, the Officers-in-Charge of the bigger exchanges, or the Divisional Supervisors. The meetings were also open to representatives of the staff, if they desired to attend.

It was not without a certain feeling of anxiety that we assembled for our first meeting, but this had not been in progress many minutes before we knew that our fears, whatever these may have been, were groundless, for we at once settled to the business in hand and kept on constructional and happy conversational lines throughout.

A simple explanatory opening was followed by the use of official charts to illustrate the varying standards of service efficiency achieved in the district over a number of years, while the factors contributing to improvement or deterioration were outlined. Statistics, as such, were avoided so far as that was possible, but the figures were translated into chart form so that their bearing on the service was apparent at a glance, and would probably be retained in the memory in a more practical and recognisable form than figures or percentages.

One of the greatest mistakes we make is to remember and talk about that which is wrong or displeasing, and to forget the other side. The general proceedings and the talks were therefore on informal lines. "Lecturing" was taboo. "Scolding" was avoided like the plague. The bright spots of

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the service were discussed as well as those not so bright. Where appreciation was deserved it was given without reserve or qualification, and, where helpful suggestion or constructive criticism seemed necessary, this was given in similar manner.

The foregoing procedure was observed throughout the series of meetings, and resulted in a delightful and helpful atmosphere, a correct perspective, and a body of listeners ready and willing to appreciate, assimilate, and apply all we had to tell them.

When the official spokesman had finished suggestions and comments were invited on any matter that, in the opinion of the staff, was worth bringing forward for exploration as a possible means of improving the service, or the removal of what the staff considered was a hindrance to the attainment of maximum efficiency.

If evidence were needed as to the atmosphere referred to above, the response to this invitation would supply it. There was a little diffidence at first for, like ourselves, the staff probably wondered what was going to happen, but after the first step had been taken there were no more fears. Questions, criticisms, and suggestions were readily forthcoming, a particularly gratifying feature being an evident desire on the part of the staff to acquire further information regarding their work. The effect of this was apparent in the constructive character of the criticisms and the originality and reasonableness of some of the suggestions put forward. Naturally, there was duplication, but nothing like so much as expected.

On no occasion did a meeting lag in interest, rather the contrary in fact. The duration averaged 75 minutes. Altogether we held 39 meetings with a total and average attendance of 545 and 14 respectively, and we were all convinced that, if followed up in the proper spirit, much good would result.

In the Autumn of 1926 a similar scheme was tried in the Glasgow District and met with such success that it was repeated in 1927.

My remarks in respect of the Liverpool meetings apply with equal force to Glasgow. From the outset an atmosphere of goodwill and helpfulness was apparent, once again criticism and suggestion were on constructive lines, and we found the time allotted to the meetings all too short, on many occasions, to permit of every point being explored just as thoroughly as desired.

I am sure no further comment on this aspect of the case will be necessary when I say that no less than 750 questions and suggestions were put forward by the staff. These have been attended to, or are receiving attention. Over the two sessions we held 105 meetings with a total and average attendance of 1,692 and 16 respectively. The normal duration of each meeting was 90 minutes.

The experience gained at Liverpool was of much help in inaugurating the scheme at Glasgow. Arrangements that resulted in a waste of time were eliminated and the method of recording and tabulating the minutes was changed for the better. In 1927 still further improvements were effected, particularly in the sense of advancing the discussions; more ground was covered and, generally, the talks reached a higher level, due—it is thought—to the assimilation and application of the information given at the 1926 meetings. The fact that this was possible was very encouraging.

An interesting point in connexion with the Glasgow arrangements was that:—

(*a*) Representatives of the Accounts and Contract Sections were invited to, and did, attend some of the meetings and,

(*b*) Every available telephonist in the district attended at least one meeting at each of the 1926 and 1927 sessions.

The staff attached to the other branches in the Telephone Section were thus enabled to see the service from a different angle, while the officers attached to the outlying exchange staffs were afforded an opportunity of meeting with each other and with the staffs of the larger exchanges with whom they had worked for many years but whom they knew only as "Central" and so on. The opportunity was taken on these occasions moreover to show the visitors round one or more of the City exchanges, a proceeding in itself sufficient to justify their coming to "Town." The Travelling Supervisor "mothered" them and went to considerable trouble on their behalf, which it was quite evident was appreciated to the full.

It has been possible in Glasgow also to gauge the effect of the meetings, from some points of view. It is not practicable to submit figures directly connecting the scheme with service efficiency, but there is clear evidence of an appreciation in the general standard. There is also good reason for believing that each Glasgow telephonist, particularly in the City area, is handling more effective (Revenue earning) calls than ever before, due undoubtedly to a better understanding of general operating requirements, a personal appreciation of what really constitutes efficient service, and, shall I say, a more human appreciation and kindlier spirit of tolerance between supervising and supervised.

So far as the minutes were concerned, these were kept, at Liverpool, by members of the Traffic Office Clerical Staff who had been telephonists. At Glasgow they were kept by telephonists. I cannot pass this point without paying tribute to the excellence of the work at each office. It is not an easy matter, particularly to officers inexperienced in such things, to keep a faithful record of happenings at meetings packed with interesting and diverse topics, but the splendid way in which the officers concerned carried out this duty gave great pleasure and satisfaction to everyone directly connected with the working of the scheme.

When the meetings were over the minutes for each exchange were summarised and set out on a schedule in the form of question and answer, which was duly circulated to the exchanges, accompanied by an invitation to all concerned to study, and particularly to bring to notice anything that may have been overlooked.

I cannot do better perhaps than subjoin a few typical extracts from:—

(1) The Minute Books.

(2) The Schedules in respect of some of the Glasgow exchanges.

(1)

Mr. . . . . stressed the advantages of clear enunciation. A voice with a smile in it was a great asset, particularly in the Telephone Service.

Miss . . . . suggested an improvement in the date stamp used for tickets

Miss . . . . considered that the testing of head sets was a waste of time.

Miss . . . . suggested that keyless ringing should be fitted at incoming O.W. positions.

Miss . . . . said that transmission in Glasgow was bad; this was much better in America (personal experience).

Mr. . . . . said that the training of P.B.X. Operators was receiving special attention.

Miss . . . . said that . . . . exchange was challenging calls unnecessarily and that this must be very irritating to the subscribers.

(2) December, 1927.

Glasgow Telephone District.

Staff Meetings, November-December, 1927. Questions, Answers and Comments relating to the . . . . . Exchange.

Question. No.	*Book No.*	*Page No.*	*Question.*	*Answer or Comment.*
3	1	70	Difficulty is being experienced in reading bottom rows of meters. Can the present arrangements be improved?	This has been referred to Headquarters.
1	3	170	Can another Junction be given to Central Exchange?	This is being provided.
14	1 & 2	34 120 123	Can the 3rd Bell & 5th Douglas Order wires be separated?	A re-arrangement of the "B" positions is in hand which it is hoped will settle this matter too.
40	1	35	Can more Junctions be provided to the Western Exchange?	The Traffic records do not justify an increase at present.
1	3	133	Can subscribers and Sub Office Assistants be trained in the passing of Phonograms?	This is in hand to be dealt with as a general question.
16	3	149	Can the perforations of the telegrams pads be improved.	This will be attended to.

THE FINAL MEETINGS.

Another arrangement introduced at Glasgow consisted of a final meeting which was attended by representatives of the Exchange Supervising and Operating Staffs and of the Accounting, Contract and Traffic Branches, under the Chairmanship of the Postmaster-Surveyor, Lt.-Colonel F. N. Westbury. Progress reports were submitted and the work of the Sessions briefly summarised and commented upon. Colonel Westbury was unable to attend the 1927-28 meeting through unexpected, but fortunately only temporary, indisposition, and we were much indebted to Mr. D. S. Currie, our Assistant Postmaster for so ably taking the Chair at very short notice.

The following agenda will indicate the representative character of these final meetings. It would be difficult, I think, to combine, in one assembly, a body of officers more typical of the varying interests and sections that go to make up the organisation of a Provincial Telephone District, on its commercial side.

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Telephones, Glasgow,
Feb. 23. 1928,

Meetings of Exchange Supervising and Operating Staffs, Glasgow District. November-December, 1927.

Arrangements for Final Meeting at the Central Exchange Retiring Room, 11 a.m., Monday, Feb. 27.

CHAIRMAN ... COL. F. N. WESTBURY, O.B.E.

Supported by—

Mr.	A. E. Coombs	District Manager.
„	E. J. Johnson	Traffic Supt.
„	F. Lucas	Contract Manager.
„	J. Law	Chief Clerk.
„	J. Thomson	Traffic Supt., Cl. II.
„	G. Lane	„ „ „

Messrs. W. Roan, D. Macdonald, J. M. Hamilton, G. Hunter, W. Palk, A. E. Higgins, E. Wilkins and J. J. O'Rourke, Assistant Traffic Supts.
Misses Cameron, Kay and Mortimer—Supervisors.
Misses Fleming and Houston, Officers-in-Charge, Bell & Western.
Mrs. W. Reid, Travelling Supervisor.
Miss A. L. Wood, Controlling Officers' Assocn. (Telephone Section).
Miss H. B. Mowat, U. P. W. (Telephone Section).
Miss Tennant (Minute Secretary).

And the following selected Telephonists :—

Misses	McMillan and Tindall	Central.
„	K. K. Mitchell and K. Park	Trunk.
„	M. A. Sinclair and E. N. McGregor	Douglas.
Miss	W. Handley	Western.
„	I. M. C. Cloud	Bell.
„	Convery	Bridgeton.
„	M. T. McLean	Paisley.
„	McPherson	Larger Suburban Exchanges.
„	Grierson	Small Exchanges.

Agenda :—

(*a*) Statements by the District Manager and Traffic Supt., also Misses Cameron, Kay, Mortimer and Mrs. Reid and Misses A. L. Wood and H. B. Mowat.
(*b*) Remarks, if required, by any other officer.
(*c*) The Chairman.

So far I have dealt principally with what has been done, but what is the conclusion of the whole matter ? Has it been worth while ?

If my experience counts for anything the answer is decidedly in the affirmative. One can sense a change in the atmosphere without being able to say precisely what has given rise to the feeling. Official tests will not provide the data on which analyses can be made. Traffic men who are interested in the service will know what I mean. A good service officer can tell almost immediately he enters an operating room whether or not the traffic is circulating smoothly, he doesn't need the confirmation of statistics.

After all, what is the final test of efficiency ? Loads ? No. Fitting of staff to requirements ? No. Correct valuation of calls ? No. Nicely written explanations of service complaints ? Heavens, No ! ! All these things, and others that need not be detailed, must play their part—and an essential part, too—in the administration and organisation of our service, but I submit that the supreme test is the quality of the service we are rendering to the public, interpreted in terms of effective calls.

How do these meetings help ? If they are conducted in the proper spirit and with the enthusiasm of the volunteer, rather than that of the conscript, they will result in improved co-operation, coupled with a clearer understanding by all concerned of view points other than their own. They also bear directly on and stimulate the spirit of goodwill, of which we hear so much in these days.

It is worse than useless to talk at people in an academic way regarding fractions of seconds and percentages of irregularities, for that sort of thing simply irritates without helping, but to indicate, as we have been trying to do, what these fractions mean when multiplied millions of times, and what a bad effect on the service minor but repeated irregularities will have, also to be ready with information on all phases of the service, is the proper way to remove hindrances to efficiency and thus to eliminate the waste due to faulty methods.

AN APPRECIATION.

I cannot conclude without expressing my thanks to all those who have helped in the arranging and working of these meetings.

As Traffic Supt., Liverpool, I received every official and personal encouragement from my late respected District Manager, Mr. E. J. Hidden, who was a great chief in every way but in none more than the way in which he was always ready to help, by word and deed, those of us who had the great good fortune to serve under him.

Then my immediate Traffic colleagues and the Officers in Charge of the bigger exchanges left no stone unturned to make the scheme a hundred per cent. effective.

I thank them one and all.

In my capacity as District Manager, Glasgow, I have been particularly favoured in having so helpful an official chief as Colonel Westbury, our Postmaster-Surveyor, who, from the first, has evinced great interest in the scheme and has translated this into terms of practical assistance and encouragement. The knowledge that such was the case has been of immense assistance to everyone associated with the Glasgow Telephone Branch.

In this case, as at Liverpool, the Traffic Staff and the Officers in Charge of the larger exchanges entered into the work with commendable zeal, for which I thank them.

There were difficulties of course in both the districts, these will arise in connexion with any new idea, but at Liverpool as at Glasgow, they were looked upon only as stepping stones to greater effort and, when we had finished what was really a strenuous time, we experienced the delightful feeling of having done something useful. If there is a better tonic than that I should like to hear about it.

Just a final thought, Mr. Editor. To those of your readers who may consider that the holding of meetings such as these is at least worth a trial, I submit the following "bovrilized" suggestions which may be applied, perhaps, to both sides of the table.

1. Be human.
2. Talk *to* not *at*.
3. Keep a sense of humour.
4. Smile, when the occasion demands, even if the laugh is on yourself.
5. Deal with the bad points of the service but don't forget the good.
6. Accept criticism in the spirit intended. If in doubt put the kindlier interpretation on it.
7. Deal with, and answer, every point raised, no matter how seemingly trivial.
8. Have the same confidence and belief in the good faith of those around you as you expect for yourself.
9. Encourage the staff to come forward *at any time* with suggestions that may bear on the efficiency of the service.

REVIEWS.

"*Intermediate Electricity and Magnetism.*" *By R. A. Houston, M.A., D.Sc., Lecturer in Natural Philosophy in the University of Glasgow.* (*Published by Longmans, Green & Co., Ltd. x + 170 pp. Price 4s. 6d.*)

As would be expected of one who is following in Lord Kelvin's footsteps, this little book is distinctly above the average for elementary textbooks of electricity and magnetism. It deals with every phase of the subject, from the fundamental facts of magnetism and electrostatics up to electrical discharge in gases, radio-activity, the constitution of the atom and electrical oscillations and waves. No knowledge of mathematics beyond the elements of algebra and the definitions of the trigonometrical ratios is assumed, but within these limits mathematical demonstrations are freely and rigidly employed. For instance, in dealing with the theory of the magnetometer the complete formulae are first deduced, and then the simplified formulae, obtained by neglecting the dimensions of the magnet under investigation, are given with the warning that for accurate results the simplified formulae cannot, in general, be employed.

Numerous exercises, with answers, are given, together with a collection of questions from recent papers set at London Matriculation and Intermediate B.Sc. examinations, and at the examinations for the Higher Certificates of the Oxford and Cambridge Schools Examination Board.

We are sure that any reader who conscientiously works through this book will have no difficulty in passing any of the examinations mentioned, while it can also be recommended to anyone who is not actually studying for any particular examination but who wishes to obtain a sound and up-to-date knowledge of the subject.

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"*Exponentials Made Easy.*" *By M. E. J. Gheury de Bray.* (*Published by MacMillan & Co., Ltd. x + 253 pp. Price 4s. 6d.*)

Many of our readers have no doubt been helped in their mathematical studies by the little volume entitled "Calculus Made Easy," by Silvanus Thompson.

The present book has been written in the same popular style, and is a most interesting and readable introduction to a portion of higher mathematics which is usually considered somewhat abstruse, and yet is of very great importance to electrical engineers, and especially to telephone engineers. Mr. de Bray has a genius for exposition, and has dealt with his subject in a remarkably clear and charming manner. The progress of the reader is facilitated by many worked examples, and there is in addition a collection of exercises (with answers) after each chapter which enable the reader to test his knowledge.

We can strongly recommend this book, not only to those whose professional duties call for an acquaintance with the particular branch of mathematics with which it deals, but to any of our readers who, having an elementary knowledge of algebra and trigonometry, would like to extend their mathematical studies into a most interesting and fascinating field.

"*Wireless Principles and Practice.*" *By L. S. Palmer, M.Sc., Ph.D.* (*Published by Longmans, Green & Co. xi + 504 pp. Price 18s.*)

The development of the art of radio communication is now-a-days so rapid that what were the standard books a few years ago are now hopelessly out of date. The appearance of a book such as the one under review, in which the recent developments of the subject are dealt with from a serious scientific point of view, and not in the journalistic style of the average popular manual, will be welcomed by the electrical engineer who, while perhaps not actually engaged in wireless work, wishes to keep in touch with that phase of his profession, by the student, and by the amateur whose aspirations rise above the assembling of a receiving set from a wiring diagram.

The first five chapters, dealing with the principles of high-frequency currents, wave motion, high-frequency circuits and the thermionic valve, constitute an excellent summary of the physical basis of the subject. Then follow two chapters dealing with the various methods employed for producing high-frequency currents. The next chapter deals with the electromagnetic theory and the propagation of Hertzian waves. In the following two chapters are described the methods used for the detection and amplification of high-frequency currents. The next chapter deals with wireless telephony, and the final chapter with directional wireless.

Following each chapter is given a bibliography which will be found most useful to the reader who wishes to pursue further any particular phase of the work.

Mathematics are used freely when necessary throughout the book, but at the same time sufficient explanation is given of the results obtained to enable the book to be of use to the reader who may wish to experiment scientifically but who may not be in a position to follow all the steps by which the results are reached.

The book is certainly the best on the subject which is at present available for the class of reader for which it is intended.

"*British Freshwater Algae.*" *By the late G. S. West and F. E. Fritsch.* (*Published by the Cambridge University Press. xv + 534 pp. Price 21s.*)

There are probably few professions which call for more miscellaneous knowledge than that of the present-day Post Office Engineer. Telegraphs, telephones, generating plant, electric light, electric lifts, steam and oil engines, no matter what mechanical or electrical device may be under the control of the Department, the engineer is expected to take charge of the job—and he carries it through successfully.

Among the minor troubles with which he may meet in the course of his work, if this happens to involve dealing with a water installation of any kind, is the growth in the system of some species of the minute plants known as algae. These may suddenly increase in an inexplicable manner, and cause considerable trouble before they can be removed.

In view of this possibility a knowledge of the habits and mode of growth and reproduction of these plants is desirable. Unfortunately, however, the only English text book on the subject, by G. S. West, which appeared in 1904, has long been out of print. A new edition was in preparation, but was interrupted by the death of the author. The work has now been continued and completed by Professor Fritsch, of East London College, and a serious lacuna in English scientific literature has thus at last been filled. The ground is thoroughly covered, and the reader should be able to identify, at least within generic limits, any fresh-water alga which he may meet.

The book will be welcomed, not only by engineers who may need its information professionally, but also by amateur microscopists, to whom the algal flora appeals because of the great beauty and interest of its individual members as well as on account of their economic importance.

GLASGOW TELEPHONE NOTES.

On April 30 the staff of the Glasgow Office presented Mr. J. S. Wallace with a silver tea service and other articles, together with a crocodile hand-bag for Mrs. Wallace, as a token of their esteem and good wishes on the occasion of his promotion to the position of Higher Clerical Officer in the Newcastle District Office. Mr. Wallace commenced his telephone career in 1904 in the service of the Glasgow Corporation and was transferred to the Post Office in 1906. Mr. A. E. Coombs, the District Manager, presided over a representative gathering of the staff, and, in congratulating Mr. Wallace on his promotion, expressed the hope that he was only the first of many to go on promotion from the Glasgow Clerical Staff.

We congratulate Miss M. A. Sinclair and Miss A. B. Brown on their promotion, the former to an allowance post, the latter to the chargeship of the Maryhill Exchange, which also carries an allowance.

It is a good thing sometimes to see ourselves as others see us and to look at happenings from angles other than our own. At our recent staff meetings, we appointed Minute Secretaries with a simple instruction to record, in their own way, all that transpired at the meetings. Previous experience was unnecessary. We were desirous of getting a point of view untrammelled by training, precedent, or academic ideas of correct phraseology.

We got what we wanted all right and, on occasion, in a most refreshing and original manner. A few extracts may be interesting :—

(1) Mr. —— suggested a discussion with regard to the duties of the exchange.

Not a murmur was heard !

(2) Mr. —— thought the meeting was inclined to drag so he told a story of the service to see if it would liven things up.

The oracle worked !

(3) Miss —— said that some of the chairs were very wobbly.

Mr. —— thought this might be due to the Charleston craze.

The question was referred to the Aide-de-Camp !

(4) Miss —— asked what a monitor should say in reply to such remarks as—

"Are you half wits ?"

"You are all rotten to the core."

"I would kick you all into the gutter."

The answer to this was that if you replied in similar strain, you were merely descending to the level of the person at the other end. The cases, if repeated, should be reported to the office.

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Mr. —— here said that he sometimes had had worse experiences; he had been thrown out of premises but had gone back again the next morning.

A voice: "For your hat?"

(Curtain.)

Humour—conscious or otherwise—is truly the spice of life!

The Auditor.—There was something so icy and swift, so impersonal and uncompromising about this man that his very presence seemed an accusation. He looked to be a man who would never make nor overlook an error. He first seized the currency, and with a rapid, almost juggling motion, counted it by packages. Then he spun the sponge cup toward him and verified the count by bills. His thin white fingers flew like some expert musician's upon the keys of a piano. He dumped the gold upon the counter with a crash, and the coins whined and sang as they skimmed across the marble slab from the tips of his nimble digits. The air was full of fractional currency when he came to the halves and quarters. He counted the last nickle and dime. He questioned the cashier concerning each of the cash memoranda with unimpeachable courtesy, yet with something so mysteriously momentous in his frigid manner that the teller was reduced to pink cheeks and a stammering tongue, although he knew the cash was right to a cent.

O. HENRY.

Television in Anticipation.

A subscriber, long in answering the 'phone, on being advised that she was too late and that the caller in the Kiosk had gone away, promptly answered: "Oh, sorry, exchange! Do you know if it was a lady with a white hat on!"

M. L. T.

George Square, Glasgow.

SEEN FROM THE HEAD POST OFFICE WINDOWS.

George Square on a spring day—the sun high in the heavens shining brightly on the varied architecture of this unique square, each side a law unto itself, yet all blending to wonderful uniformity.

In the inner square the monuments stand out and seem to keep guard. The flower beds are rich with shrubs and spring flowers bestowing delight on the pedestrians as they cross the square. The traffic continues unheeded by the small coteries of women and children who hold sway at certain "stances."

Unnoticed, a small child has strayed from one of these to a bed of daffodils near by; the daffodils, swayed by the wind, dance in the sun and are tempting beyond resistance. There is one which seems bigger and yellower than all the others, and this wee chap is filled with "Desire"—the desire to possess. It is a high wall for his small body to clamber over—(it is nearly one and a half feet high!) and the desired thing seems a long way off. He wonders if there would be time to get it before he is missed. Courage outweighs caution—he must try! Nothing in life is of any importance at the moment except the flower that is just beyond his grasp. Up he climbs! How hard he breathes in his efforts; how his chubby hands are outstretched; how his golden curls flop about his head as he struggles; how his eyes glisten with the light of capture; how the coveted flower just evades his grasp. Ah! now he is up: he pulls it and it comes to him. It is his at last!

He settles down to an orgy of admiration. He has attained the heights—he is no longer in George Square, but in the "Seventh Heaven." What a wealth of beauty and wonder he sees in the yellow daffodil. He loses time and space in his happiness and is frolicking with the fairies, when suddenly he is rudely snatched from his paradise with a slap and angry tones and before he realises what has come to him, he is tucked away in his mother's shawl. Ah, well! he still has his treasure and holds tightly to it. But alas! when that is espied it is torn from his grasp and lost. Life is an unendurable thing now. The side of his face has a stinging pain and he is sore and nothing matters since he has lost his thing of beauty. He whimpers a little and then his tears give place to drowsiness; his head droops on his mother's shoulder and he "slips away" quietly to dream of a land of golden daffodils.

M. L. TULLOCH.

MIDDLESBROUGH TELEPHONE DISTRICT.

To mark the occasion of his promotion to Traffic Superintendent, Class I, Reading, a presentation was made on May 4 to Mr. S. R. Vaughan, late Traffic Superintendent, Class II. The gifts, which consisted of a mahogany clock (from the District Manager's and Sectional Engineer's staffs) and a handsome mahogany writing bureau (from the Supervising and Exchange staffs) were presented by Mr. H. G. McFarlane, District Manager, who spoke with sincere appreciation of Mr. Vaughan's excellent service at Middlesbrough, and tendered hearty wishes for happiness and prosperity in his new sphere.

Various members of the staff, on behalf of their respective Departments, suitably endorsed Mr. McFarlane's remarks and good wishes.

NEWCASTLE-ON-TYNE NOTES.

Miss Graham Memorial.

A MEMORIAL to the late Miss Jessie G. Graham, Supervisor of the Newcastle-on-Tyne Central Exchange, which took the form of the naming of a cot at the Brough Childrens' Holiday Home and Orphanage, South Shields, under the auspices of the P.C.H.A., was unveiled by Mrs. Stewart, wife of the District Manager, on Jan. 28 last, in the presence of a large gathering of friends and colleagues. At the close of the unveiling ceremony, Mr. J. Gwyther, late Traffic Superintendent, handed to Mr. Brough of the P.C.H.A. on behalf of Miss Graham's many friends in the Post Office service, a cheque for £52 10*s.* as a donation to the funds of the home.

During the past Winter three very successful dances have been held by members of the Newcastle-on-Tyne Telephone Staff at the Heaton Assembly Rooms. That on Jan. 6 was a Carnival Dance, there being an attendance of over 300. Prizes for the best and most original fancy costumes were won by Misses Green and Heslop and Messrs. Henderson and Tate and presented to the winners by the Postmaster Surveyor, Mr. C. Creighton. Much credit for the huge success of these events is due to Miss L. Robinson, Supervisor of the Fees Section, Miss Kelly of the Traffic Section, Mr. J. Middlemas and members of the Committee.

A Swimming Club has been formed by the Female Telephone Staff at Exchanges in the Newcastle Postal Area and promises to be a very successful venture. Much enthusiasm has been shown by the 125 full members, and the Club, which is named the Exchange Swimming Club, appears already to be firmly established. Trophys have been obtained for competition among the members for the Club Championship, Graceful Swimming, &c., and capable instructresses have been engaged.

The opening meeting took place at the Gibson Street Baths on the 16th instant.

LIVERPOOL TELEPHONE SERVICE NOTES.

The lilt of music; shaded lights;
Soft perfumes; reminiscent nights;
Secluded corners; sidelong glance,
When winter reigns, on with the dance.

A wide expanse of green, all shorn
Of daisy flower. A velvet lawn,
The stretching nets; the swift ball's flight,
Forgotten now the winter night.

The advent of fine weather, coupled with the lighter evenings set most of us to work removing the gut preserver, and manipulating the reviver—that is most of us who are not in the happy position of being able to start the season with a new racquet. We think the bonus figure has let us down this summer.

The Post Office Tennis Club opened its season on Saturday, April 28, in perfect weather. The club, the majority of lady members of which, by the way, belong to the telephone staffs, possesses four fine courts pleasantly situated in Mossley Hill. It is affiliated to the Civil Service Sports Club, and its membership is open to the whole of the Post Office Staff and friends.

The varied duties allow of a larger membership than that of outside clubs, and as there is still room for a limited number of new entrants, an invitation is offered to all who enjoy this most popular summer recreation.

The District Office staff held a final social at the British Legion Rooms on May 4 and all sections were well represented. The District Manager was present and would no doubt appreciate his staff at play just as well as at work. Shall we whisper that his novelty hat, together with that of a well-known member of the Traffic Section, looked "chic."

The mere men of the staff are looking forward to a little jaunt on Friday, May 25. Although two "swallows" don't make a summer, high tea at the Hunts Cross Hotel, followed by a bowling main and interludes, is at least a fair start.

C. H.

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LONDON TELEPHONE SERVICE NOTES.

Contract Branch.

THE results obtained by the Contract Branch during the month of April were a net gain of 4,143 stations.

The readers of the *Journal* may be interested to learn that the canvassing staff at the Contract Branch obtained orders for 74,876 stations during the last financial year, whilst the clerical force obtained orders for 21,088 stations. The tariff post card (M 135) which is placed in containers in Post Offices, to be taken by members of the public, originated 9,408 enquiries for service which resulted in orders being obtained for 7,131 stations, which are, of course, included in either of the above figures. The post cards advertising extensions issued with the April and October 1927 accounts resulted in 1,166 enquiries from which orders for 50 exchange lines and 733 extensions were obtained. The inquiries received through the medium of the literature &c. issued by the Telephone Development Association resulted in orders for 1,179 exchange lines.

* * * *

The interesting article on busy-tones by the Superintendent in the May issue of the *Journal* makes us wonder whether the time will ever come when a Contract Officer's authorised equipment will include a television set which would enable him to show the subscriber a queue of telephone callers waiting to get through to him or his staff !

* * * *

Sports Notes.

The Contract Branch Cricket Club fixtures for May and June are given below :—

May	15.	Practice Match at Battersea Park.
„	22.	„ „ „ Finsbury Park.
„	29.	Versus Traffic (League) at Chiswick.
June	5.	Versus Accounts (League) at Chiswick.
„	12.	Open date at Battersea Park.
„	26.	Versus Accounts (League) at Chiswick.

Mr. Oliver has been elected Captain and Mr. Hodgkiss Vice-Captain. The Secretary is Mr. Culley of the City Contract Office, and any player wishing to take part in the practice matches should communicate with any of the above.

Football.—The final results of the L.T.S. football team read as follows :—

Played.	Won.	Lost.	Drawn.	Goals. For	Against.	Points.
20	10	6	4	62	45	24

The team occupy the 5th position in the League table and at one period were pressing the leaders very close. On the whole the season has been much enjoyed and many excellent and closely contested games have been played. Mr. Cowdrey of the Contract Section was the most prolific goal scorer and the team was well led by Mr. Adams the Captain, who together with Mr. Evans, the Secretary, combined to make the initial season a pronounced success.

Bowls.—Considerable success attended last year's inauguration of the L.T.S. bowls section, and in addition to most of last year's players being available, several others have promised to assist. Matches will be played at Chiswick as before, and the interest in the Bunbury Cup Competition promises to be keener than ever.

The first match played on May 7 against the L.P.S. was lost by a narrow margin. The rink led by Mr. Pollard of the Contracts had, however, a convincing win by 24 points to 10. The next match is against Science Museum on May 22, followed by a Bunbury Cup Match on May 31 against A.G.D.

Netball.—The season concluded on April 21 when the final for the "Liddiard Shield" was played at Chiswick on the C.S.S.A. ground.

Twenty teams entered for the championship, four of these scratched, leaving 16 to contest for the trophy, generously given by Miss J. Liddiard, M.B.E., Lady Superintendent of the Controller's Office.

Kensington Exchange and A.R. 7 section of the Accounts Branch were the finalists. The latter team won by 15 goals to 13. The score at half-time was 7—4 in favour of the Accounts team. Shortly after resuming the score was 8—8. Kensington fought hard to keep level with their opponents but were eventually beaten by 2 goals.

Both teams with their supporters afterwards adjourned to the Pavilion for tea when Dame Maude Lawrence presented the Shield to the winners and silver medals to each member of the winning team, the former on behalf of Miss Liddiard and the medals from the L.T.S. Sports Association.

Miss Liddiard afterwards congratulated the teams upon the excellent manner the match was played.

The shield will be put up for competition each year and the L.T.S.S.A. hope to again offer medals to the winners.

Among the supporters were Miss Cox, Female Supervisor, and Mr. Hugh Williams representing the L.T.S.S.A.

The L.T.S.S.A. are anxious to form a properly constituted Netball Section and are prepared to contribute 5 guineas to the general funds of such an organisation. A meeting will be convened to further this object.

Accounts Branch C.C.—The Accounts Branch Cricket Club successfully opened their season at Battersea Park on May 4 when a friendly match was played against the Ministry of Labour and won by 30 runs.

Other matches have been arranged with the Ministry of Labour and also Pensions, War Office, Agriculture & Fisheries, London Engineers, Secretary's Traffic, Ladies Civil Service Club, and Brighton Postal Service.

In addition to these fixtures the club, who were last year's winners, have again entered the L.T.S. Cricket League and are looking forward to some further keen contests.

The officers of the club remain the same as last season, with the exception that Mr. H. B. Taylor has been elected Captain, vice Mr. C. Drabwell, who has been temporarily transferred to another Branch, but will continue to play for the Accounts Branch.

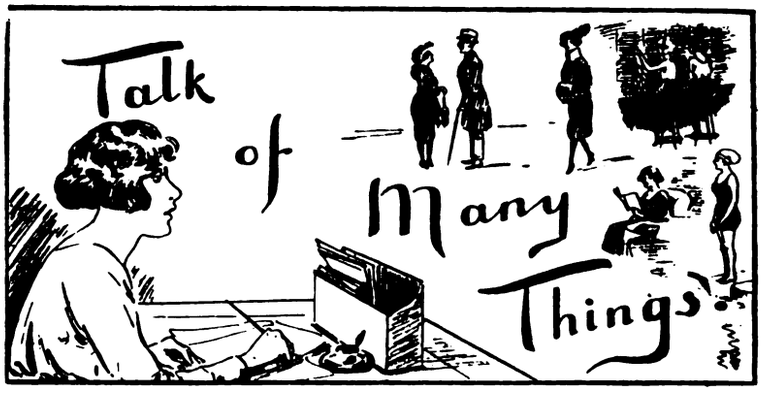
Given good weather and the hearty support of honorary members and the staff in general the club hopes to have another successful season.

* * * *

Promotions :—

Miss E. D. EVANS appointed Asst. Supr., Class I, at Avenue Exchange.
Miss B. M. BROTHERWOOD, Asst. Supr., Class I, at Clerkenwell Exchange.
Miss S. H. MULVANEY, Asst. Supr., Class I, at Trunks (Continental).
Miss A. M. GOLDSWORTHY, Asst. Supr., Class II, at Edgware Exchange.
Miss ETHEL M. WELL, Asst. Supr., Class II, at Kensington Exchange.
Miss L. M. KINGWELL, Asst. Supr., Class II, at Victoria Exchange.
Miss F. E. FOWLER, Asst. Supr., Class II, at Paddington Exchange.
Miss E. A. E. MAYLE, Asst. Supr., Class II, at Regent Exchange.
Miss E. J. NICHOL, Asst. Supr., Class II, at Mountview Exchange.
Miss P. FIRTH, Asst. Supr., Class II, at Paddington Exchange.
Miss A. A. COLE, Asst. Supr., Class II, at Clissold Exchange.
Miss M. E. GROOM, Asst Supr., Class II, at Museum Exchange.

WE TELEPHONISTS



Nelson—and Others.

I FEEL sorry for Nelson because he appears to be so much out of the public mind. It is true that he has a magnificent column all to himself in Trafalgar Square and has four lions, designed by a very famous artist, to guard him. But it does seem as though, in their endeavour to honour him, the public have only succeeded in placing him beyond human reach and ken. Once he was a hero but now he is known mainly in terms of his column. That which was to serve as the pedestal of fame has become the pinnacle and the column is greater than the man. The lions ignore the public just as the public ignore Nelson. The public surge at his feet with their eyes on the level but if they would only look upwards they would forget the column and see Nelson.

I have recently looked upwards and at the top of this column I have seen our pictorial design. I had never really noticed it before, and it reminded me somewhat of Nelson, but in a contrary way. Nelson's column, it is necessary to remind ourselves, exists because there was a Nelson, but our picture exists because there is a column. Just as it is refreshing to consider Nelson independent of his column, so I find that it is not without interest to consider the picture apart from the column. Both Nelson and the picture are ignored because the column is the thing.

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There is a good deal in the picture to provoke imagination, but whether what I have read into it has any basis in fact I do not know; but romance is often of greater interest than truth. Who is the girl at the desk? I do not think she can be the Editress—she is far too beautiful. Do I mean the girl or the Editress? Ah! She is a contributor who is either talking of many things or endeavouring to balance her accounts on the eve of St. Pay Day. Her coiffure is a disgrace to modern society, and she does not use a fountain-pen or wear horn-rimmed spectacles. All the indications are that she has a bun. "Off with her head," as the Queen said. In the middle distance are a girl and a man. The girl is not a telephonist, she is a flirt. Her name is Phyllis, but that is just as it happens. I do not suppose that all girls of that name are flirts. The object in her hand is a dead rat but no one knows why. She is Naughty but Nice. Off with her head also. The man is tall and distinguished. He is much too immaculate for a Civil Servant and is, I think, an international crook. His name is John Jarvis, but that was his father's fault. He has sold both spats to buy cocaine, and he would raffle his mother-in-law for the same purpose. His influence is bad and he ought to be removed. Behind him but aloof and very proper is a supervisor, arrayed in expensive furs. She is carrying an early-Georgian muff but otherwise she is quite a good sport. She is called "The Streak," so she must be nice because nicknames are a sign of popularity. When the artist sketched her she was suffering from a sore throat. She ought to be sent to the M.O. and placed on sick leave. To her right are two South Sea Islanders—no, on closer inspection they appear to be telephonists. The dropped positions on either side of them indicate that the picture was taken in the busy hour. One of them has golden hair. It is said that she will dye happy. The person below in the chair is reading—what, I don't know. It might be a Sunday School prize, but I doubt it. She is not so demure as she looks—she stops out late on bath-night. The mermaid appears mainly to be wrapped in thought. Why does she hesitate on the brink? Can't she swim or will she shrink?

Altogether they seem a poor lot, don't they?

PERCY FLAGE.

Competition.

Our readers will rejoice with us that our pictorial heading has evoked the foregoing article from our contributor, Mr. Flage; but in view of his remarks, we feel that we can do no less than seek a new heading. We therefore offer half a guinea for the most suitable design for use at the head of our column.

The drawings should be submitted on or before July 9 next, and envelopes should be marked "Designs," and addressed as below.

Central Exchange.

(*Further Statistics.*)

Encouraged by our Tottenham contributor who in a previous issue supplied some valuable information *re* directories, we applied for and obtained "Leave by substitute and time owing" (including grace time), "Annual," "Compensatory," "Special" and U.D.D., and with all this time at our disposal we were able to make full and exhaustive enquiries into several matters that have puzzled us for a considerable period, with the result that we have emerged triumphant, laden with valuable statistics that we think should be broadcast all over the British Isles, including Ireland, as it may serve to remove the creeping depression there.

1.

If all the out-of-order sleeves used in London and Hatch End were placed end to end they would go three times round the dome of St. Paul's and once down Threadneedle Street. Considerable difficulty was experienced in obtaining these figures as Dean Inge complained of the scratching noise in the dome, no doubt caused by our boots, which have been previously used for mountain climbing. Another drawback was the infringement of T. 1,750 which distinctly states that all out-of-order cords should be capped.

2.

If all the dockets used since 1927 were placed corner to corner they would reach from here to the desert of Saharah. The difficulty in obtaining this valuable information was enormous, as the City police complained strongly that we were interfering with the one-way traffic.

3.

After many periods of careful study and deep thinking, also days spent in the British and other Museums, we find that if all the bad language used by the subscribers at the opening of the Holborn Exchange were collected together and thrown into the sea it would probably cause an earthquake in Northern Nigeria.

4.

If all the dials in London were placed face to face a great many would receive a terrible shock!

5.

Also if all the wrong numbers given in London during the year 1924 were placed end to end they would reach from London to John O' Groats (wherever that may be). After having discovered this last gem, we found that we were due back at the exchange, so shall have to leave further investigations for a future date.

D. D.

A Tribute.

(*The impressions of a supervisor loaned to T.*)

Of all the sections I have seen—
(With 'duds' and learners shot in 'em!),
The most industrious, I ween,
Is my platoon at Tottenham!

Each girl is at her post to time—
I don't waste words allottin' 'em—
And ere the matins bell doth chime,
They're hard at work at Tottenham.

The "slackers" and the chatty ones—
I'm pretty cute at spottin' 'em—
Are just as rare as "catty" ones—
They are not found at Tottenham.

No grumbling voice is ever heard—
No supervisor swattin' 'em—
For no one ever "gets the bird"—
It isn't done at Tottenham!

The answer and the clear are good,
(E'en opals with a dot in 'em!)
The supervision's understood
To be O.K. at Tottenham.

No letters of complaint arrive.
With phrases curt or hot in 'em—
Nor "off the deep end" do they dive
Re long delays at Tottenham.

The subs. seem happy and content,
And if there be a Scot in 'em,
He will not grudge the yearly rent
For telephones at Tottenham.

It took me just one afternoon,
To gauge the good they've got in 'em—
So I must get a transfer soon,
And join the ranks of Tottenham!

C. A. S.

Regent Exchange Flannel Social.

A very successful Flannel Social, under the direction of Mr. Pounds, was held in the Dining Room of the Regent Exchange on Friday, May 18 last, the proceeds of which were entirely devoted to the Elizabeth Garrett Anderson Hospital.

Members of the Traffic and Engineering Staffs partook of a very enjoyable evening. Mr. P. Keatley presided over the musical side of the programme, assisted by a saxophonist, and drummer. It was agreed that this trio made an ideal combination for dancing.

Refreshments were obtainable at nominal prices, and in passing special mention should be made of the fruit sundaes which were supplied by the senior members of the Telephonists' Staff, who are always ready to give an exhibition of their skill in this direction.

More of these Socials, it is hoped, are to be organised in the near future, and members of both Regent and Gerrard staffs are earnestly requested to give their whole-hearted support to these very enjoyable functions.

L. K. (Regent Exchange).

Contributions to this column should be addressed: THE EDITRESS, "Talk of Many Things," *Telegraph and Telephone Journal*, Secretary's Office, G.P.O. (North), London, E.C.1.

PRESENTATION TO MR. J. H. TURNER.

AT the North-Western District Office, Preston, on March 29, a presentation of a camera was made to Mr. H. J. Turner, Assistant Traffic Superintendent, by members of the Traffic Staff on his transfer to the Southampton District Office.

Mr. R. Morgan, Traffic Superintendent, Class II, occupied the Chair, and the presentation was made by Mr. S. O. Allen, District Manager, who spoke with appreciation of the work done by Mr. Turner. Several others contributed remarks regretting the departure of Mr. Turner from the North-Western District and wishing him health and happiness in his new sphere.

Mr. Turner suitably replied, thanking the staff for their gift and the kindly expressions of good wishes towards him.

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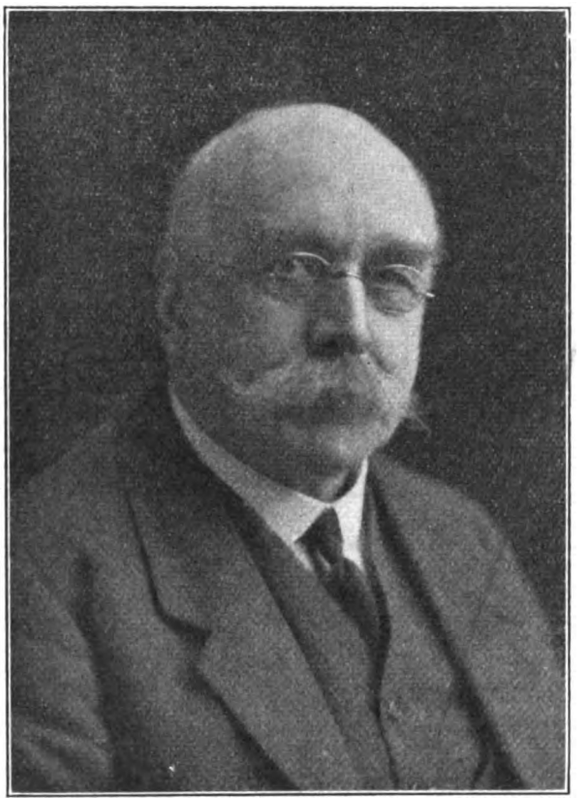
C. B. CLAY FOOTBALL CHALLENGE CUP.

The final tie in the C. B. Clay Challenge Cup was played on the Tufnell Park Football Ground on Friday, April 20, between the Post Office Stores Department (Holborn) and Victoria Athletic (Centre Internal Section).

A good crowd of spectators turned up to see what proved to be a typical cup tie game between two very equally balanced sides. The only goal of the match was secured by Victoria Athletic about half-way through the first half. The Stores team made great efforts to equalise in the second half and many exciting incidents took place around the Victoria Athletic goal, which was, however, kept intact by the splendid goal-keeping of S. J. Joy. Victoria Athletic thus became the holders for the ensuing year.

The presentation of the cup, together with miniature cups for each member of the winning team, was then made by Col. C. B. Clay, the original



LIEUT.-COL. C. B. CLAY.

donor of the cup, whom everybody was delighted to see looking as fit and well as ever, a fact which a recent photograph of Col. Clay, here reproduced, gives ample testimony.

In thanking Col. Clay for making the presentation, Mr. Woollard drew attention to the fact that the competition was over 30 years old, the cup having been presented as far back as 1898 by Col. Clay, when Superintendent of the Metropolitan Area of the National Telephone Co., and was for competition amongst the various staffs in the Metropolitan District.

This competition is still open to all teams representing the staff of any branch or section of the following Departments :—

London Telephone Service.
Post Office Stores Department.
London Engineering District.
Office of the Engineer-in-Chief.

Entries for the competition are cordially invited and particulars can be obtained from the Hon. Secretary, Mr. C. J. Head (London Engineering District), Mr. A. E. Wild (London Telephone Service), or Mr. F. Woollard (Engineer-in-Chief's Office).

The proceeds of all matches are devoted entirely to charity and the competition has been the means of raising upwards of £200 during the past two or three years.

A BRIEF CHRONOLOGY FOR STUDENTS OF TELEGRAPHS, TELEPHONES AND POSTS.

BY HARRY G. SELLARS.

(*Continued from page* 179.)

1843 ... ... 18,500 lb. of powder fired by electricity at the South Eastern Railway works at Dover and 1,000,000 tons of chalk dislodged. Jan. 26.

United States Congress granted 30,000 dollars for the construction of the first long telegraph line—between Washington and Baltimore—working the Morse system.

Cooke devised an overhead system of telegraph wires on wooden posts in which the wires were suspended on hooks fitted with goose quills at the point of contact to provide insulation. Metal shields were placed on the posts over each wire, which was coated with anti-corrosion paint.

Cooke introduced airtight insulated telegraph cables, a detector to indicate loss of insulation, and apparatus to provide pressure of dry air.

De la Rive, of Geneva, by using long wires running through insulated coils, increased the sound effects produced by Page.

Schwabe noticed that the periods of variation of magnetic declination coincided with periods when sunspots were at their maximum.

Watson's semaphore station destroyed by fire.

Morse wrote to the American Treasury reporting his submarine trials in New York Harbour and predicting telegraphic communication across the Atlantic.

Dr. Montgomery submitted specimens of guttapercha to the Society of Arts.

1843 ... ... Sir Robert Peel's Government decided that the number of rural posts should be based upon the number of letters for each locality, the minimum being fixed at 100 letters a week. The boundary of the "free delivery" was fixed by the P.M.G. June.

Sir Rowland Hill proposed a Colonial Money Order system.

Bain patented an indicating telegraph system, and proposed a copying telegraph system in which transmission was effected from set-up type.

Cologne and Deutz connected by a telegraph cable under the Rhine.

Stoehrer constructed an electrical machine.

Wheatstone invented instruments for measuring the constants of a voltaic series, and introduced the "Wheatstone Bridge" (invented by Christie) to the Royal Society.

51 bags made up for London Preston Travelling Post Office Down Night Mail, 44 bags for the Up Mail.

(John Ramsey, of the Missing Letter Branch, devised apparatus for exchanging mail bags *en route*.)

1844, Jan. 1 ... First criminal arrested by aid of telegraphy. Description of a man named Tawell, who had just committed a murder, was telegraphed from Slough to Paddington.

Wheatstone experimented with submarine cable in Swansea bay.

1844 ... ... Notice of arrival of Prince Albert (afterwards Prince Consort) telegraphed from Paddington to Slough and conveyed thence to Windsor by horse messenger. Apr. 15.

George Wilson patented machinery for manufacturing envelopes.

1844 ... ... Morse's telegraph apparatus put into operation between Washington and Baltimore. May.

Capt. J. N. Taylor, R.N., devised an apparatus for conveying signals at sea by passing compressed air through a trumpet containing a steel reed, the notes procured being varied by means of four keys.

Telegraph poles preserved by the Burnettising process erected between London, Southampton and Gosport.

(Spiller invented an augur-like earth borer for excavating holes for telegraph poles.

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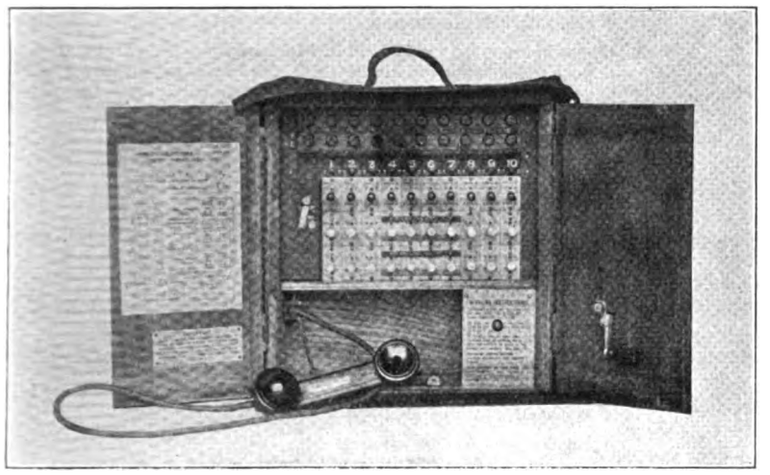

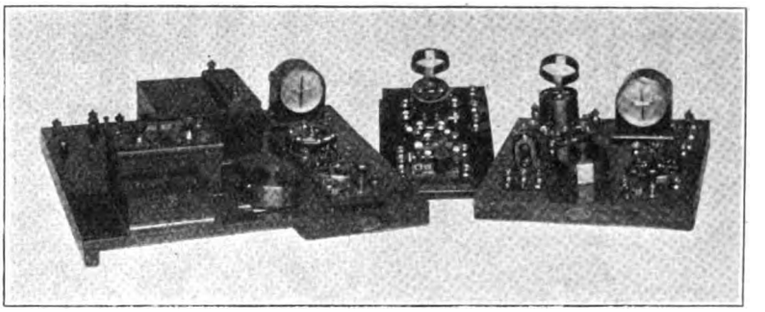

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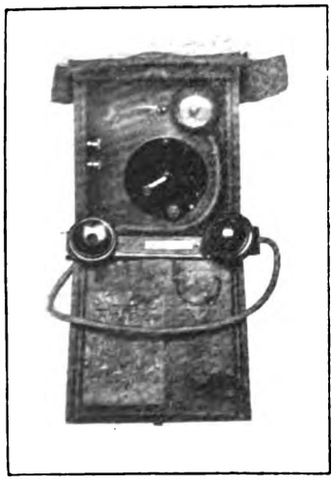

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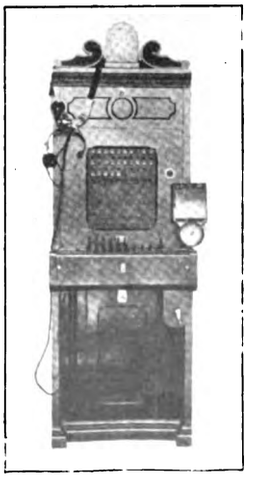

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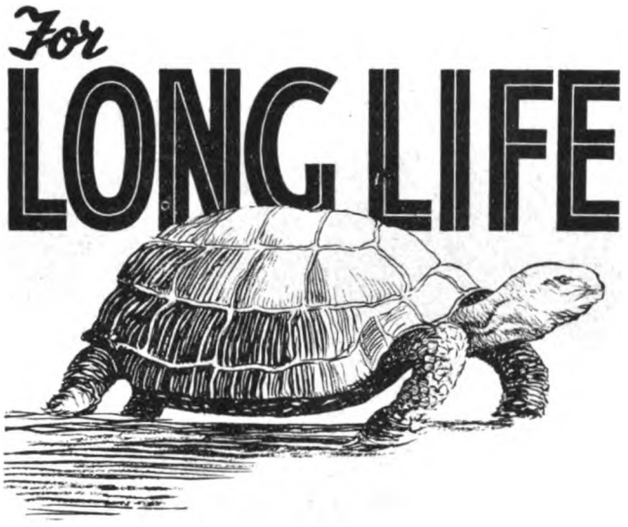

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Bohlken invented a metal disc earth borer for use when erecting telegraph poles.

Oppenheimer, of Manchester, designed an iron telegraph post, the base of which took the form of an inverted pyramid and which was driven into the earth by the blows of a descending weight.

Hamilton invented an iron telegraph pole, which Colonel Mallock improved.

Harloe patented a brown earthenware single shed solid insulator for telegraph wires.)

Printing telegraph worked between Nine Elms and Wimbledon (six miles) on an underground copper wire insulated by asphalte.

Railway companies required to permit erection of telegraphs.

1844, Oct. 22... Edouard Branly born.

Hancock improved manufacture of guttapercha.

1845 ... ... Cooke and Wheatstone's electric telegraph line opened between London and Southampton.

1845, Mar. 13 John Frederick Daniell died.

1845, May ... Travelling Post Offices established between Rugby and Newcastle-on-Tyne, Exeter and Bristol, Gloucester and Tamworth.

1845, May 8 ... *Morning Chronicle* (London) published the first telegraphic newspaper report, which detailed a railway meeting at Portsmouth.

Game of chess played between London and Gosport by telegraph.

A parliamentary speech by Queen Victoria telegraphed to Portsmouth.

1845 ... ... John Watkins Brett and Jacob Brett, unaware of Wheatstone's project, registered a company to establish communication by cable between Europe and America, and between England and France. June 16.

Jacob Brett, prompted by Royal E. House and supported by John Watkins Brett, patented a typewriting telegraph apparatus in United States of America.

Bain patented an electro-chemical copying telegraph system.

Faraday drew up a list of substances which are attracted to a magnet and another list of those which are repelled. The former he called "paramagnetic" and the latter "diamagnetic." He also constructed a magneto-electrical machine consisting of a copper disc rotating between permanent steel horseshoe magnets.

(Bertsch, Carrè, Darwin, Holtz, Kienmayer, Le Roy, Thomson, Topler, Varley, Voss, Wimshurst and Winter also constructed electrical machines.)

Wheatstone and Cooke modified Farady's magnetic-electrical machine by substituting electro-magnets for permanent steel magnets.

Faraday discovered that a ray of light polarised in a certain plane can be diverted by the action of a magnet.

Lord Kelvin (William Thomson) published a work on electro-statics and carried out researches in electro-dynamics.

Faraday constructed a voltameter which measured the strength of a current by the quantity of water decomposed in a given unit of time.

Dellman and Lord Kelvin invented electrometers.

Faraday demonstrated that the two kinds of electricity are developed together and in equal quantities, and invented the term "lines of force" in connexion with magnetism. He also showed that all kinds of electricity produce the same chemical actions. He predicted that retardation would occur in submarine cables.

Kirchoff definied the electrical law that current divides between circuits in parallel in direct proportion to their respective conductances.

Double cone insulator devised for overhead telegraph lines.

1845, Aug. 4 ... William Young and Archibald McNair, of Paisley, patented a method of enclosing cotton-covered wires in lead piping and insulating them with wax, pitch, asphalt, &c.

(Reid Brothers devised a multiple-core lead-covered cable.)

1845 ... ... Jean Maurice Emile Baudot born at Magneaux, France. Sept. 11.

E. Hill and Warren de la Rue patented machinery for manufacturing envelopes.

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Wheatstone experimented with guttapercha as an insulator for cables.

Cooke and Wheatstone introduced their single-needle telegraph apparatus. Schilling's method of reversing the current to convey various combinations of signals was used.

J. W. Starr, of Cincinnati, introduced an electric lamp with carbon filament in vacuum.

Ezra Cornell laid a twelve-mile cable in the River Hudson, between New York and Fort Lee. The cable consisted of two copper wires covered separately with cotton, insulated with india-rubber and enclosed in a leaden pipe. After being in use for some months the cable was severed by ice.

1845, Nov. 5 ... Faraday announced a discovery that light, heat and electricity were modifications of a great universal principle.

1846 ... ... Last of the London mail coaches arrived from Norwich and Newmarket. Jan. 6

West applied to the British and French Governments for permission to lay a cable from Dover to Calais. He experimented in Portsmouth Harbour.

E. F. Weber constructed an electrodynamometer for measuring strength of currents by means of the electro-dynamic action of one part of the circuit upon another.

Electric Telegraph Company formed.

1846 ... ... Lars Magnus Ericsson born at Norrtomta. May 5.

Greener and Staite introduced Electric Light system.

1846, June 16 Presentation of £13,000 to Sir Rowland Hill, at Blackwall, in recognition of his services in connexion with the establishment of penny postage.

1846 ... ... Sir Rowland Hill appointed Secretary to the Postmaster-General, to act as adviser in postal reforms. Dec. 9.

Bain patented an electro-chemical direct-working telegraph system in which perforated tape was used at the sending station and chemically prepared tape at the receiving end.

Bakewell, Bonelli and Caselli introduced apparatus on similar lines.

Bonelli's apparatus was worked on a submarine cable between Liverpool and Birkenhead.

Bonelli, in erecting telegraph lines between Turin and Genoa, suspended wires across valleys sometimes more than half a mile wide.

1847, Feb. 11 Thomas Alva Edison born at Milan, Ohio.

1847, Mar. 3... Alexander Graham Bell born in Edinburgh.

1847 ... ... Edmund Yates entered the service of the Post Office. Mar. 11.

Bain's electro-chemical telegraph tried in Paris before Dr. Lardner and M. Leverrier over 336 miles of aerial wire to which were added 746 miles of wire in coils. The apparatus was installed in the same year between London and Manchester.

Number of arms on semaphores reduced to two.

John Henry Cordeaux devised a double shed insulator.

Highton Brothers devised a printing telegraph with a six-key keyboard and an equal unit alphabet.

Edward Highton invited by L. & N.W. Railway to take up superintendence of their telegraph system.

Faraday suggested gutta-percha as an insulator for telegraph wires. Dr. Ernst Werner von Siemens used it for covering underground lines and constructed the first German telegraph line.

Siemens-Halske firm founded.

Brett obtained a concession from Louis Philippe, King of France, to lay a cable between England and France.

Pluecker noticed that tourmaline, which is paramagnetic, became diamagnetic when its axis was horizontal.

Bancalari observed that flames were repelled by an electro-magnet.

Joule showed that the magnetism of an electro-magnet was not simply proportional to the current.

Limitation of 16 oz. for letters repealed and power of fixing limit vested in the Treasury.

1848, Jan. 1.... Electric Telegraph Company, founded by Sir William Fothergill Cooke and Joseph Lewis Ricardo, opened its first offices in London and large provincial towns.

Highton devised a method of selecting electrically one of a number of magnets so that the desired letter could be printed.

Mimault, of France, patented a telegraph system in which letters were printed at the receiving end. He employed the five-unit method of transmission.

Telegraph poles creosoted by John Bethell's system erected between Portsmouth and Fareham.

Lord Palmerston predicted that the day would come when telegraph communication with India would be established.

Mason invented the Induction Coil.

Armstrong experimented with a submarine cable in the River Hudson and suggested that a similar conductor should be laid between America and England. Werner Siemens exploded torpedoes by means of electric cables in Kiel Harbour.

Jacob Brett suggested that the current generated in the armature of Wheatstone and Cooke's magneto-electrical machine should be sent through a coil of wire surrounding the magneto, so as to increase their strength.

Wertheim investigated the production of sounds during magnetisation.

1848 ... ... John Henniker Heaton born. Sept. 8.

Henry and Edward Highton patented a printing telegraph system.

John Dicker, Inspector of Mail Coaches, improved the method of exchanging mail bags on Travelling Post Offices.

Registration fee for letters reduced to 6*d*.

"Book Post" established at the suggestion of Sir Rowland Hill. Rate, 6*d*. a pound.

1849, Jan. ... C. V. Walker connected two miles of gutta-percha-covered copper wire to the landlines at Folkestone and, taking the free end out to sea on the steamer "Princess Clementine," exchanged messages with London.

Louis Napoleon, President of the French Republic, granted a concession for landing a cable from England.

1849 ... ... Charles and Edward Bright devised a method of locating faults on telegraph wires from a distance. Feb.

Paris-Lille telegraph line extended to Calais.

Paul Julius Reuter established a telegraph system between Aix-la-Chapelle and Berlin.

House invented a printing telegraph with a piano keyboard and a typewheel at the receiving end by means of which letters were printed on paper tape at 30 words a minute.

Nollet invented a compound magneto machine giving an alternating current.

Foucault introduced hard gas carbon pencils to take the place of wood charcoal in Davy's electric arc lamp. Gaudin used wood charcoal treated with liquid hydrocarbon.

(J. B. L. Foucault, V. L. M. Serrin, Jasper, Lever and Lontin introduced various devices for regulating the arc.)

Company formed to lay a cable between England and France.

The New Zealand Company revived the proposal for a Colonial Money Order system. Post Office prepared a plan but various difficulties prevented its adoption.

1849, Oct. 3 ... Agreement relating to the provision of telegraphic communication signed by Austria and Prussia.

1849 ... ... John Ambrose Fleming born at Lancaster. Nov. 29.

Net revenue of Post Office, £840,787.

1850 ... ... Question of rural posts reconsidered and it was decided that a post should be established when it would pay its way.

William Sturgeon died.

1850 ... ... Single copper conductor, covered with gutta-percha, laid across the Channel, between Dover and Cape Gris Nez, and signals were exchanged, but, during the night, the wire broke. Aug. 28.

John Mirand invented the "trembling" electric bell.

Breguet developed and improved the electric bell system.

Hipp, of Neuchâtel, fitted up an electric bell system in the Chamber of Deputies, Berne.

Brett and House patented a printing telegraph which modified House's instrument patented in 1849.

Morse recorder introduced into Great Britain.

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Henley introduced his quadrant electrometer and a quadrant electroscope.

Henley and Forster patented a magnetic needle telegraph composed of two deflecting needles.

Sinsteden and H. Wilde devised electric machines in which small magnetos produced the current required to energise the electromagnets of a larger machine.

Ruhmkorff devised a magneto-electric induction coil.

Walker, of South Eastern Railway, made a series of tests of speed with the two-needle apparatus. Greatest speed 20½ w.p.m., average, 16½ w.p.m. He also devised a carbon and zinc battery.

Prussia, Austria, Baden and Saxony came to agreement as regards rates for telegrams.

Highton and colleagues formed the British Electric Telegraph Company.

Electric Telegraph Company dealt with 66,600 telegrams during the year.

Over 7,000 miles of telegraph wire were in use in England.

1851, Jan. ... Farrar, writing of the electrical reproduction of sound, said: "If the current power could be varied by some slight variation of a vibrator, to be affected by the atmosphere as the tympanum of the ear is, the supposition is that the sounds of the voice might be reproduced."

Prospectus of British Electric Telegraph Company issued and public subscriptions solicited. L. & N.W. Railway withdrew from undertaking to permit construction of telegraphs over their lines and arrangements were therefore made with the Lancashire and Yorkshire Railway.

Paul Julius Reuter started a telegraph service in London.

Lippens, of Belgium, improved the telegraph instruments in use on French and German railways.

Silvanus Philips Thompson born at York.

Hans Christian Oersted died.

Tebbets (U.S.A.) and Gisborne (Brit.) obtained concessions from the Newfoundland Government and formed the Electric Telegraph Company of Newfoundland.

Cable laid across river Tennessee.

E. F. Weber developed a definite system of electrical measurement expressed in absolute units.

Telegraph wires, insulated with gutta-percha placed underground between Liverpool and Manchester in deal troughs.

1851 ... ... Oliver Joseph Lodge born at Penkhull, Staffordshire. June 12.

Manchester telegraph wires laid underground in iron pipes, cast in halves, longitudinally.

Wurtemberg signed the Austro-German telegraph agreement of 1850.

Jacob and J. W. Brett offered to lay a cable between Holyhead and Dublin for a subsidy of £20,000—the Government to have free use of the line—but the offer was declined.

Gisborne and Smith introduced an insulator for telegraph wires.

Magnetic Company laid underground lines in troughs, and protected by tarred yarn and gutta-percha, from Dover to London and Birmingham. Dessication set in and the lines were placed on posts along the highway.

Semaphores removed from roof of the Admiralty office and substituted by electric telegraph.

Wheatstone's needle telegraph used to connect Great Exhibition Building in Hyde Park with Police Headquarters, Whitehall.

1851, Oct. ... Austro-Germanic Telegraph Union formed in Vienna. Morse code adopted.

1851, Oct. 9 ... Attempt made to lay Port Patrick-Donaghadee cable, but owing to gale it was cut and abandoned.

1851, Oct. 17 Four-conductor cable laid between Dover and Calais by the hulk "Blazer" under the supervision of Mr. Crampton, of the Submarine Telegraph Company.

1851, Nov. 13 Dover-Calais cable opened for public use. Cable composed of four copper wires, each covered with a double layer of gutta-percha, twisted together with tarred hemp, the whole being covered with tarred cord and then wound round with a ten-strand wire rope.

1852, March ... Travelling Post Office established between Chester and Holyhead.

1852, June 1 ... Holyhead-Howth cable laid.

1852, July ... System introduced for conveying Greenwich Mean Time to various parts of England by telegraph. Electric Time Signal Bell and a clock were installed at the Electric Telegraph Office at 448, Strand, London.

Sir Charles Bright patented a double roof insulator for aerial telegraph wires.

English and Irish Magnetic Telegraph Company formed. W. T. Henley's magneto electric double needle used. Underground wires laid between London, Birmingham and Manchester, and from Preston to Carlisle, Dumfries, Glasgow and Greenock. Six underground wires laid from Dumfries to Portpatrick to meet the Irish cable. In Ireland underground lines laid from Dublin to Dundalk, Newry, Belfast and Donaghadee. In towns 2½-in. cast-iron piping was used, but in the country wooden troughs with galvanised iron lids were utilised. The stability of these lines rendered the company successful and prosperous.

Bright patented a system of winding coils for obtaining a greater determination of polarity.

1852, Aug. 10 Association formed for promoting cheap Colonial and International Postage. President—Earl Granville.

Bright patented a repeater for retransmitting telegraph signals. This was adopted by the Magnetic Telegraph Company.

Cable laid between Cape Breton and Nova Scotia.

M. G. Farmer, of U.S.A., conducted some successful experiments in synchronised multiplex telegraph working.

Charles Bright patented a curb telegraph key for working long cables with alternate currents.

Paris-Baden direct telegraph communication opened.

Hanover, Holland and Mecklenburg-Schwerin signed the telegraph agreement of 1850, the contracting parties being known as *l'Austro-Germanique*.

Bright patented a metallic riband for the protection of submarine cables.

1852, Oct. 4 ... Belgium, France and Prussia signed a telegraph treaty in Paris and formed *l'Union des Pays Occidentaux*.

France and Switzerland came to agreement on telegraph rates.

Bright took out a patent embracing 24 distinct telegraphic inventions, including the insulator and shackle for aerial telegraphs, a means of locating faults on subterranean or submarine cables, coverings for submarine cables, the "Bell" telegraph instrument, automatic relays, and a standard galvanometer. (Between 1852 and 1888, he introduced no less than 119 inventions.)

Breguet devised a telegraph apparatus with two indicators giving signals similar to those of the semaphore at a speed of 40 letters a minute. Two wires were required.

1852, Nov. 1 ... European and American Electric Telegraph Company established to form a link between the two submarine companies and London and cities beyond, opened the line between Dover and London.

1852, Nov. 13 Direct telegraph communication opened between London and Paris. Breguet's apparatus unsuccessful, so Wheatstone's Double Needle used. Thanks of the Submarine Telegraph Company sent to the Prince-President.

1852, Dec. ... 24,375 miles of telegraph wire in U.S.A.

1853 ... ... J. B. Lindsay transmitted messages across the Firth of Tay without continuous wires.

1853, May 6 ... First Anglo-Belgian telegraph cable laid by ship *William Hutt*, attended and aided by H.M. ships *Lizard* and *Vivid*.

1853, May 23 Port Patrick-Dohaghadee cable laid by the ships *William Hutt*, *Conqueror* and *Wizard*. The English and Irish Magnetic Telegraph Company controlled the cable.

1853, June ... Switzerland and Sardinia came to agreement on telegraph rates.

1853, June 20 London-Brussels telegraph service opened by Chartered Submarine Telegraph Company.

(*To be continued.*)

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THE

Telegraph and Telephone Journal.

VOL. XIV. JULY, 1928. No. 160.

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TELEGRAPH AND TELEPHONE MEN AND WOMEN.

LIV.

MR. W. R. BIRCHALL.

WALTER RAYMOND BIRCHALL was born in 1888, was educated at Westminster and Trinity College, Cambridge, joined the Secretary's Office in 1911, has served in the Telegraph Branch and Foreign & Colonial Branch, and as private secretary to Mr. (now Lord) Illingworth, and is now a Principal in the Telephone Branch.

It is easiest to describe him by stating what he is not. On the one hand he is emphatically not the "born-in-the menagerie" type of Civil Servant with whom we are all familiar,—the sort of man who can hardly be imagined as other than a Civil Servant or even as performing any other function than that which he actually performs. Although most of Mr. Birchall's official career has been connected with telegraphs and telephones, the connexion seems almost fortuitous; in any other branch of the service or in any outside business or profession he would certainly have made his mark. On the other hand, he is equally far from being the dilettante amateur (a type fortunately not common at St. Martin's). For years he performed with distinction the Wayleaves Duty, an arid work that would have driven a dilettante to suicide. By reason of his freshness of outlook and his quick grasp of the essentials of a complicated problem, he is frequently chosen as the victim for any special work that requires to be done; how he succeeds in combining one of the hardest and most exacting duties in the Office (the development and accommodation of the telephone service) with half-a-dozen or so of these special jobs, and yet preserves his imperturbability, his sense of humour, and his lightness of touch, is the admiration and despair of his colleagues.

He is almost invariably accompanied by a little curved pipe; and the photographer, by omitting the pipe, fails to do him justice.

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THE TOURIST TROPHY RACES.

NOT to have witnessed a Tourist Trophy race is to have missed a thrill equal to, and more sustained than, a close finish in a classical horse race, or the knock-out blow in a championship contest, and it follows that so interesting an event must offer special attractions to motor-cycle enthusiasts throughout the country.

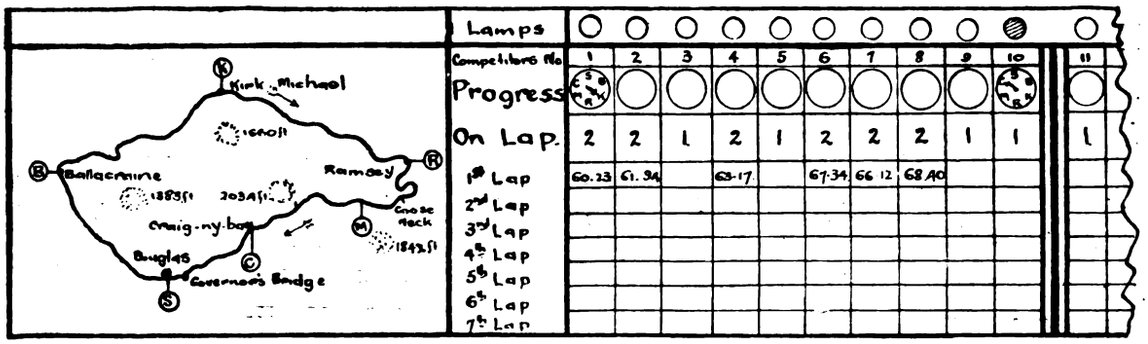
This enthusiasm is reflected at the railway termini in Liverpool during the week-end preceding the races, and the north end of the landing stage, at which point the Isle of Man steamers are berthed, presents a particularly striking scene of intense activity.

On Friday, June 1, motor-cycles of all shapes and sizes, shepherded by men, also of all shapes and sizes, together with a large crowd of passengers, were quickly embarked on four steamers, and before noon over twelve thousand people and five hundred motor-cycles were on their way to the Isle of Man.

traffic. The compactness of the Island and its insularity allows the authorities to close all the roads used for the course, both for the races and for the practice runs, and farmers and other owners of live stock are under request to ensure such stock being prevented from straying over the course.

The distance covered by the riders, 264 miles, on seven laps of the course affords a severe test to see which is well worth the sea crossing.

The Press throughout the country gives wide publicity to most of the items of interest connected with the trials; photographs of successful riders are reproduced; crash and other incidents are dwelt upon, and all occurrences calculated to afford interest and light reading are set out in the inimitable manner common to journalism, but little is mentioned of the care and forethought given by the numerous officials in order that the trials may be carried out smoothly and without hitch, so that the maximum interest may be afforded to the spectators. Perhaps this is rightly



CONTROL BOARD.

Points of Communication.

S.	The Start and Finish.			
B.	Ballacraine,	8 miles.	Ht.	207 ft.
K.	Kirk Michael,	14 „	„	130 „
R.	Ramsey,	24 „	„	60 „
M.	The Mountain Bungalow,	31 „	„	1,400 „
C.	Craig-ny-Baa,	34½ „	„	791 „

Explanation of Readings.

Competitor No. 1 has passed Kirk Michael on his 2nd lap. Speed on 1st lap 60.23 miles per hour.

Competitor No. 10. Last point on Progress Clock. Craig-ny-Baa on 1st lap.

Lamp Flash denotes signal from Governor's Bridge. Rider will pass Grand Stand within one minute of flash.

Bell rings simultaneously with flash.

There has been some loose criticism recently regarding the choice of the Isle of Man for the Trophy races, mainly due to the sea trip, but the reasons for the choice defy criticism. This choice is founded on the main factors necessary to the success of the trials. The course must be difficult and varied enough to provide the supreme test for the machines undergoing trial; its shape must allow adequate control to be maintained throughout the race, and its situation must be in proximity to places able to cater for a crowd large enough to secure the financial success of the undertaking.

Communication by telephone must be established at numerous points on the course so that the spectators on the Grand Stand at the point called "The Start" may be made fully cognisant with the progress of the riders. It has, in fact, been stated on numerous occasions that without the admirable telephone arrangements extant, the public interest in the races would be insufficient to meet the financial requirements.

The Isle of Man offers better facilities of this kind than any district in Great Britain. Douglas out of season can accommodate with ease all who desire to see the trials. The course runs close to many points having permanent telephone and telegraph communication with Douglas, and the keen interest taken in the races by the local inhabitants results in ordinary business being brought almost to a standstill, thus freeing the junctions for race

so; the public pays for the goods and is entitled to delivery without fuss. However, the more discerning of the spectators must have pondered over the working of the control board, and it is in connexion with this piece of apparatus that the telephone staffs were concerned.

It may be stated that during the period of the trials this year, the Manx telegraph staff was augmented by fourteen telegraphists from Liverpool, and representatives from the Engineering Departments of both Manchester and Liverpool, and of the Liverpool telephone traffic, were in attendance. The Inspector of Engineering for the Isle of Man, by reason of his local knowledge and experience, acted in the capacity of liaison officer between the T.T. Committee and the Post Office.

The temporary lines thrown out to points on the course were of rubber-covered wire carried on any available supports, in much the same fashion as was followed during the war, and a special separate circuit was provided to link up Governor's Bridge, a point three-quarters of a mile from The Start on the inward journey. These arrangements existed for the practice runs undertaken during the two weeks prior to the race, as well as during the race week.

The control boxes stood high above the Grand Stand, facing The Start, and the control boards were situated on the opposite side of the course.

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From the diagram representing the control board, it will be seen that on the left is a map of the course; points of communication being marked by initial letters. The board is divided into sections, each section providing similar facilities for reporting progress of ten riders.

The numerals on the top of the board below the lamps correspond to the riders' numbers, and the initial letters on the progress clocks below coincide with those on the map denoting the points of communication.

Each section has two boy scouts in attendance perched above and behind it, one being in continuous telephonic communication with the control box by means of a head set, the other controlling the dial fingers of the progress clocks from behind, thus showing the progress of his riders at the various points on the course. At the front of the board two boy scouts tear off the proper leaf of the calendar-like arrangements against "On Lap" as the riders flash by, whilst another official paints the figures showing mileage per hour on the corresponding squares below.

The lamps on the top of the board acting in conjunction with a resonant bell are controlled by pushes situated in the control box, and it is in connexion with these that the circuit between Governor's Bridge and The Start is installed. As a rider passes Governor's Bridge on the inward journey, the control box is signalled, and the operator there presses the push allocated to that rider. The corresponding lamp flashes and the bell rings, thus communicating instantly to the spectators that a particular rider will pass the Grand Stand within a minute.

As each rider is sent off at half-minute intervals, it will be seen that, particularly at the commencement, the operators in the control box must work with a high degree of speed in order to maintain the supply of information to the control board which, in view of the large number of entries, is built up of many sections. Actually the control box and board were duplicated in order to provide a north control and south control, thus enabling the boards to be observed from all points on the Grand Stand.

The time-keepers were situated on the right of the control board and the checked figures were passed along an arrangement similar to the mechanical cash carriers in a large store. Any considerable delay of a rider due to crash or other incidents is, of course, observed by the spectators on the Grand Stand. For instance, considerable interest is taken in riders like Simpson, Handley or Bennett. They are signalled on the Progress clock to have passed Kirk Michael and should in ordinary course reach Ramsey in less than 10 minutes. If the indicator on the relative Progress clock is not moved in that time, something has gone wrong, and details are conveyed to the spectators on the Grand Stand by means of the new type loudspeaker megaphone, their attention being first attracted by the sounding of a klaxon horn.

In looking through the numerous descriptions of the races, the writer noticed a small paragraph paying tribute to the efficiency of the control. The following extraction from the paragraph, headed "T.T. Telephone Arrangements," may be quoted:—

> "We are apt to overlook the fact that year after year things run so smoothly at The Start and spectators on the Grand Stand are kept splendidly posted with almost every incident of note on the 37½-mile stretch. This is a wonderful achievement and reflects great credit on the Telephone Department's staff. The provision of this fine service entails considerable thought and enterprise, carried out unobtrusively, and it is seldom given a thought by the public, but it is a fine work, well done."

In conclusion, I would like to express thanks to Mr. R. A. David, Liverpool Telephone Traffic, for information received, and it might be mentioned that a visit to the Isle of Man in June provides a splendid holiday. The country is then at its best.

T.T. TRIFLES.

A lonely mountain road whose windings turn
To follow by the tumbling sparkling burn
Wherein the rainbow trout besport themselves.
The bluebelled paths step down in serried shelves;
The sheep unheeding wander through the ling;
The hawk above, poised still, on outstretched wing;
The crane, mysterious, silently alone
Seeks what he can, by crag and stream-washed stone
The heather bloom and gorse the hue of flame,
The peaceful silence, seeming nature's aim
To look upon the valley and the sea
Serene and calm: to live contentedly.

The mountain road, now crowded at each turn;
Standing behind the harebell, cowslip, fern,
A throng expectant, strained, intent for thrills,
Watch steadily the saddle, twixt the hills.
A cloud of dust, a sharp staccato shriek
Foretells approach of grim and crouching freak
All leather padded, armed against the crash
That oft-times comes when round the corners flash
Machines keyed up by latest-known device:
Mobility, immobile in a trice.
Thus industry to nature pays its due
For using nature, building things anew.

C. H. HAYCOCKS.

RETIREMENT OF MR. T. B. JOHNSON, M.I.E.E.

(Superintending Engineer, N.E. District, Leeds.)

WHEN Mr. Johnson came to Leeds, there were umpteen telephone stations, exteen miles of open line, oxteen miles of underground and one official cat, and it was indicative of his remarkable personality that within two days there were umpteen telephone stations, exteen miles of open line, oxteen miles of underground, one official cat and three kittens . . . But for Bennett of St. Martins Le Grand, a sketch of Mr. Johnson's character and career would perforce have started and continued on such lines, and the thanks of the Service are due to Bennett for his satire.

Recently, in the Press, leading men have been writing of "Who I am" and "How came I," and although I cannot give the authorised geneological tree of Mr. Johnson, I am confident of the fact that at the roots of that tree we should find on the paternal side, a King's Jester. One who, in moments of national emergency, when panic was seizing the Court, could, by a jest full of wisdom, cause the balance of judgment to be maintained irrespective of the forces on either side pulling their full weight, and the fiercer the struggle to upset the balance, the more the wisdom and subtlety concealed in the jests. Yes, there is a King's Jester amongst the roots, and the qualities of such a person are clearly shown in the branch of the tree.

On the maternal side, deep down, there must have been a heavy-jowled church dignitary, with a face of thunder, a voice of rolling drums, an April sunshine sparkle of eye, and a general attitude of preparation for the fighting of any cause which tended to lower the standard of mankind.

He would have many difficulties to settle, and in the settlement, maintain unity. He did not believe in sitting on the hedge. . . . Hedges divide. . . . He was for unity and rather than sit on a hedge and, from that position, endeavour to placate the peoples on both sides, he would cause the thunder clouds to gather, the roll of the drums to be heard, the hedge to be torn up, and the hitherto divided people would then commingle and find that they had much in common, and in that commingling the April sunshine would have its hope-reviving effect . . . and the hedge was not replaced.

The spirit of the mediator ever hovered around Mr. Johnson, and that spirit, reinforced by the spirit of the wise Jester, made up the whole of his personality. In all his actions one or the other spirit took control, with results readily imagined.

List ye to the Spirits!

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The King's Jester (on receiving an endorsement from Headquarters wherein there is concealed the bite of a serpent or the sting of a wasp).

Well, that's a thick 'un! Let's put it aside till to-morrow and then, methinks, I'll draw the sting.

(On arrival of friends from the Accountant-General's Department.)

Welcome! Whilst ye know nothing of engineering, I recognise that it is not necessary to be a hen in order to decide whether an egg is satisfactorily boiled. Test the eggs. Some you will find good, and perhaps some a little fresh!

The Heavy-jowled One with the Twinkling Eye.

No man is a true leader whose impulse is selfishness. Cultivate a balancing mind: no one proposal holds all the advantages and no disadvantages.

On the example of a Supervisor depends the morale of the staff under his control. On the staff's confidence in the integrity and straightforwardness of the Supervisor depends the efficiency of the District.

Work is not an evil and leisure an unmixed good, but the wise combination of work and leisure gives joy in the performance of either.

Tact is sympathetic insight; the reading of the other man's mind, coupled with kindly consideration.

Mercy does not mean weakness. An operation is painful, but it is merciful, inasmuch as after the knife, comes ease. The weak spot—that which has let us down for months—is cleared of disease, and becomes healthy once more. Mercy many times calls for the use of the knife.

The surgeon's joy is not in the use of the knife, but in the clearing away of the disease and the alleviation of pain.

After over 44 years in a Service, governed by regulations, precedents, etc.—a service said by outsiders to make all men follow in the rut made by his predecessors, it is remarkable that a man can finish up as did Mr. Johnson. Red tape did not bind him—he used it as a decoration. Ruts could not hold him—there was no joy of life in a rut, and as he came along the Service road, finding well-worn ruts, he levelled them out and made of them pleasant pathways. He left flowers where previously there had been stones, and a well-beaten track, and in the cultivation of flowers there is much hard work, but in that he gloried, seeing the summer's glory in the winter's dark days, and the vision drew him; and when summer did come, the display amply repaid for the winter's work.

There was nothing stereotype about him. He saw things from an unusual angle. He could detect a difficulty ere it presented itself and that faculty enabled him to be fully prepared when the time came to deal with the difficulty.

No comments are necessary about his organising ability, his high efficiency, &c., as there are hundreds of similar giants in the Service, but it was his humanity, that spirit of fighting any cause which was tending to lower the standard of manhood, which gave him just that little extra height, which made him stand out from amongst the ordinary giants.

Consequently, he was an unusual character; unusual owing to the fact that, whilst he possessed all the characteristics of other Service giants, he held a "something," a secret known only to men of deep spiritual insight and purity of purpose, which placed him in a position calling forth not only the admiration of his fellow men but their love, and the love of man to man is even greater than the love of man to woman.

Officially, the list of his achievements is obviously a lengthy one, but on Nov. 11 each year he called his Headquarters staff together at 11 a.m. . . . and prayed with them . . . as those who knew him would expect him to do. The greatest action of his career.

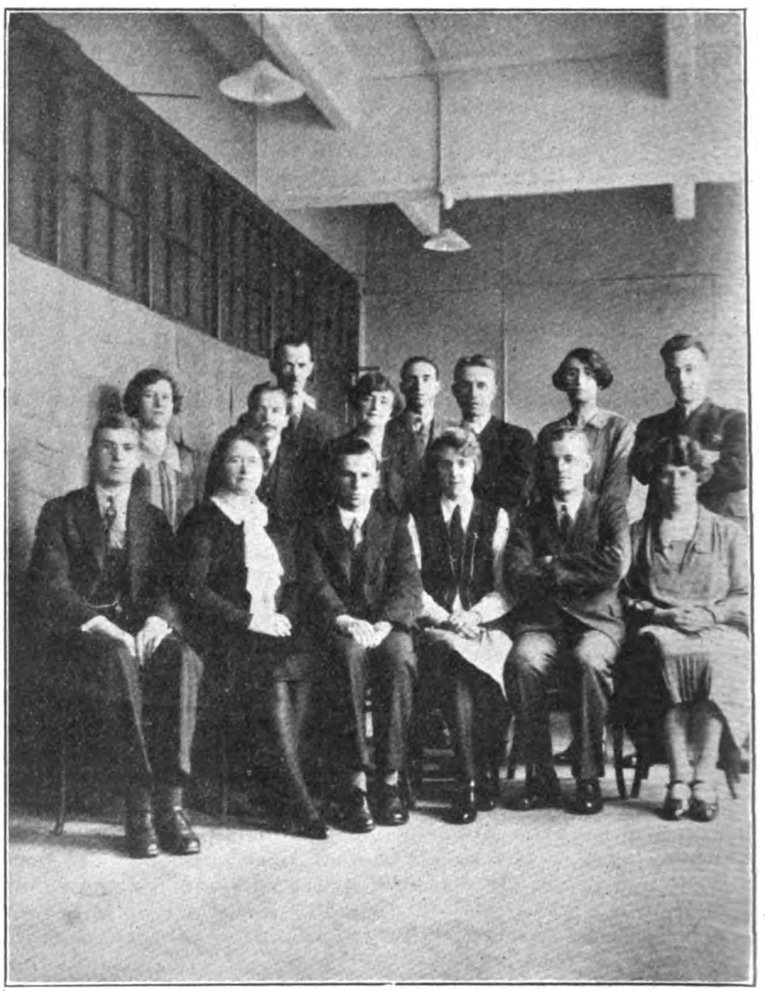
Courage! and such courage must have given great joy to his heavy-jowled ancestor, and brought tears of happiness to the eyes of the jester

G. H. H.

LECTURES AND DEMONSTRATIONS ON THE TELEPHONE SERVICE.

SOME UNOFFICIAL NOTES. BY A. E. COOMBS, GLASGOW.

THERE was quite a flutter at Glasgow in the early summer of 1927 when it was first known that Headquarters had it in mind to send a model operating set to the district, for use during the following autumn and winter at, or in connexion with, public lectures on the telephone service, on the assumption that a sufficient number of these could be arranged by the local staff. May I say that right from the outset we had no doubt whatever as to whether or not we *could* carry out the scheme, our energies were therefore directed to the discovery and adoption of ways and means best calculated to achieve maximum results.



GLASGOW LECTURE PARTY.

Back Row (left to right).—V. W. Grace (Telephonist); E. J. Johnson, Traffic Superintendent; J. M. Hamilton, Asst. Traffic Superintendent; J. S. Drennan, Asst. Supervisor; G. Hunter, A.T.S.; A. E. Coombs, District Manager; A. B. Miller, Telephonist; E. E. Wilkins, A.T.S.

Front Row (left to right).—A. E. Higgins, A.T.S.; A. L. Wood, Asst. Supervisor; W. Palk, A.T.S.; J. D. Weir, Telephonist; R. C. Love, Engineering Officer; C. Downie, Telephonist.

In the first place a small and representative committee was set up, which immediately got to work on essential preliminaries. To begin with, our staffs, and the Postmasters of the district, were circularised regarding the scheme so that those who were interested in literary societies, guildries, clubs and kindred organisations could make this known, or could advise us as to whom we may write. We then secured the help of the local press, who inserted short paragraphs from time to time, and last, but not least,

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we sent personal communications to local public men setting out the scheme in brief and asking their help in generally broadcasting this.

Each of these methods was productive of results and a programme was gradually made up until, by the end of August, 14 lectures had been arranged, while negotiations were in hand for a number of others.

Though the demonstration had been given at other places, and the experience gained thereby was available for us (this was most helpful) we had practically to recast the scheme to suit local conditions. Even then, before we appeared in public, a full-dress rehearsal was carried out at the Operating School, which was attended by a large number of the staff, who had been asked to act the part of a critical public. I can assure my readers that the Lecture Party was put through its paces in very thorough manner. If you want a real critic, one from inside the Service would leave little to be desired!

The criticisms were relevant, constructive, and helpful, and the officers who were taking on the duty of lecturing to the public were much helped thereby.

Notwithstanding earnest study and close application, we were not without a certain measure of anxiety when the time arrived for our first public appearance. On Wednesday, Sept. 21, 1927, we made our initial bow to a gathering of 183 people, but the proceedings had not gone very far before we sensed success, while the Chairman's eulogiums at the close made us feel that we had at least made a good start.

Not so anxious perhaps, but still a trifle nervous, we set out for our second meeting on the following Friday, Sept. 23. The assembly this time numbered 121. There was again no need for worry, as our audience warmed to us from the first, and, when they had got over the shock of Public Department Officials coming to them to speak of their work, and on the aims of their Service, they were most enthusiastic.

There were many questions asked and answered at this meeting, and the proceedings terminated once again on a very happy note. Incidentally, the Chairman, who with his audience was evidently at a loss to understand why the Department was doing this, said to me in an aside :—

"This is very nice, you know, but where is the catch in it?"

Other meetings quickly followed; all types of organisations were covered, in the city itself and in different parts of the district. Naturally we learnt as we went along and soon found the best way of getting our audiences into step with us. Waste effort was cut out; figures were adjusted to the simplest form possible and were used in picture phraseology rather than as mere statistics.

I made use of written notes for the first few meetings; gradually these were reduced to headings on a small card, then even the card was abolished. It is far better to talk to an audience than to read to it; moreover, if a lecturer must read all he has to say because he cannot trust his memory how can he expect his listeners to remember?

Our last lecture was held on Wednesday, April 4, 1928. Including this, we had held 33 public meetings and given the lecture and demonstration to an aggregate attendance of 4,067 persons, which works out at an average of 123 per meeting. Our maximum attendance was 306 and our minimum 53.

Our experiences were varied and often humorous. At one meeting, while I was answering a question, I could not understand why the audience was so amused; when I turned round I found the Chairman wandering round the set examining the multiple jacks to find out which were real and which were not. This same Chairman, at the end of the meeting, said that as they had Post Office people amongst them, they had better close by singing the "National Anthem." We knew what he meant but lots of people might have misunderstood.

At our last meeting, the Chairman, in closing down, said something like this :—

"Now that the Post Office people have finished, let us all sing the Doxology"!

Again, this might have been misunderstood, but we knew what the gentleman intended, so we didn't feel hurt; rather the contrary, in fact.

The foregoing are typical of many other incidents from which we extracted a maximum of enjoyment. One case I must not miss. One of our Chairmen was inclined to be critical, in quite a friendly way, but before I had an opportunity of answering him a member of the audience got up and gave him a rare tousling, to the evident enjoyment of everyone, not excluding the Chairman himself.

At this same meeting, when dealing with the vote of thanks, I told a few stories which were apparently enjoyed. One small boy in the second seat from the front and two elderly gentlemen at the back were so tickled that it was difficult to terminate the proceedings, for, like Oliver Twist, they clamoured for more—our friendly critic, the Chairman, amongst them. So much for the inside "atmosphere." When we got outside it was blowing and snowing so much that before we reached our homes we were not unlike explorers newly arrived from the Arctic regions!

Incidents like these could be repeated in many and varied ways, but space is too limited for their reproduction here.

There were times when the weather was not too kind to us. It will be known generally that, on occasion, last winter served up extreme samples in different parts of the country. Glasgow did not escape these visitations and some of them appear to have been reserved for our lecture nights. On one occasion, in October, it was really unsafe to be walking the roads in the vicinity of roofs and chimney pots, and the rain—when it rained—made no mistake about it; yet 66 people turned out to welcome us. On another occasion, in January, it poured for twelve hours on end immediately before the lecture and during the meeting we thought another world flood was imminent, yet we had an attendance of 145, and a gloriously happy time to boot! The next worst time was immediately after a series of blizzards, a thaw, and the beginning of another frost. The snow was quite six inches deep and the hall at which we were speaking stood on a slight eminence! All these handicaps notwithstanding, an audience of 125 turned up, and I don't think they regretted doing so.

Our meeting policy throughout was to get away from the obvious, or the orthodox. The unexpectedness of this intrigued our audiences and made them more ready to listen to, and to assimilate, what we had to say. I am sure that many folk had the surprise of their lives when they discovered how human we were and that we could smile with them even if the laugh was against ourselves.

This proceedure got us on common ground right away. We were "in tune" with our listeners from the first. Naturally a favourable atmosphere quickly resulted, so that, in the end, we spoke to each other just as we were thinking. There was no need to strain for diplomatic phrasing in order to ensure technical rectitude and politeness. On no occasion did we attempt to talk "at" anyone, neither was there any attempt to talk at us. At each meeting the result was a happy climax and a mutual respect that must bear good service fruit.

Perhaps a brief summary of procedure will be of interest.

The lecture was advertised generally as being on "The Telephone Service from Within." Before each meeting the Chairman and the lecturer had a few words together regarding procedure. In the meeting proper the Chairman opened the proceedings, introduced the lecturer and handed the meeting over to him for the time being. The latter then introduced the main topic of the evening by a talk in general terms regarding the Post Office Telephone Organisation. Co-operation with and by the Public. Criticism—Informed and Uninformed, Constructive and Destructive. Education—in Telephone Matters—of Post Office Staffs, Subscribers' Staffs and Subscribers. Costs, Ineffective Calls, and so on. The talks were adapted to the audience and followed broadly the same lines on each occasion, but the points concerned would be dealt with in different manner and, so far as practicable, in a way that would be best appreciated and understood by the particular gatherings concerned. The "occupied time" approximated to 30 minutes.

By the end of the talk—we called it a lecturette—the audience had usually warmed up to the proceedings and were in good mood for the demonstration, which was accompanied with step-by-step explanations of the set and of operating procedure, the connexion of calls between telephones placed in different parts of the hall, and finally, specific examples of how service and call difficulties arose and the best ways of avoiding or dealing with these.

This occupied a further 25 minutes, after which the meetings were thrown open for discussion, questions, or further explanations, when required. As a general rule, these took another 30 to 40 minutes and, as the opening and closing formalities extended to 10 or 15 minutes in addition, the average aggregate time per meeting approximated to two hours.

The lectures, or "lecturettes," were given by the Traffic Superintendent or myself. The demonstrations by one of the two Assistant Supervisors attached to the Operating School. The operating by two of four telephonists selected from the many who had volunteered for this work. The part of the subscribers was taken by two of four junior Assistant Traffic Superintendents, and the Engineering Officer in charge of the set.

A further interesting feature of the session consisted in the giving of the demonstration, at a series of meetings, to members of the Accounting and Contract Staffs, followed by specially conducted visits to the Central Exchange. These meetings were held in the Operating School during the period round about Christmas, when no public lectures were taking place.

There can be no dubiety, I think, as to the advantage of this, particularly to officers who may have had little—if any—opportunity of acquiring knowledge regarding operating procedure and who may not even have seen one of the larger exchanges under normal working conditions.

The lecture party was greatly encouraged, as the scheme was being developed and carried out, by verbal and written expressions of appreciation from the different organisations and societies and by many complimentary press and magazine references. Our reception at all times left nothing to be desired and we shall always recollect with gratitude and pleasure the hospitality and good fellowship we encountered on all sides. It is said that the North Briton is hard; who said it I don't know, but the allegation is one which I shall feel constrained to dispute if, and when, I hear it again.

A prime factor in the case, also, was the team work of the lecture party. To be successful in a venture of this sort teaming is essential. I am convinced that the happy blending of officialism and humanity which prevailed at Glasgow, and the sincere desire of everyone concerned to make the scheme go, contributed in no small measure to the success of the lectures.

I have experienced nothing better in my official life and I must put on record my appreciation of the loyal and cordial support rendered throughout by the Traffic Superintendent and his staff, whose services were given not only freely but enthusiastically, and to whom nothing was a trial, and an adverse condition of any sort merely a difficulty to be conquered.

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I am indebted also to the Engineering Staff concerned, who were equally anxious and desirous of making a big success of the effort. Particularly must I pay tribute to the officer in immediate charge of the set, who was a host in himself, and to the Engineer at Paisley, who rigged up and demonstrated on a special piece of automatic equipment for the benefit of the meeting held in a district served by an automatic exchange.

It may be that the scheme will be tried in other places. I hope it is, for, properly handled, it must react to the benefit of the Service.

As a final word may I say that it would be well to avoid heaviness and the ponderosity of platitudes and theories; it would be a mistake, also, to take up a defensive line of argument, even by implication. The average audience will take you at your own valuation and if you play the rôle of defendant, or apologist, it will quickly attack you or the system you represent. We set out from the first to state our case and to explain the service from an inside point of view. We had, and have, sufficient belief in our daily work to make us feel that we can hold our heads high in the knowledge that we are doing something that is worth while.

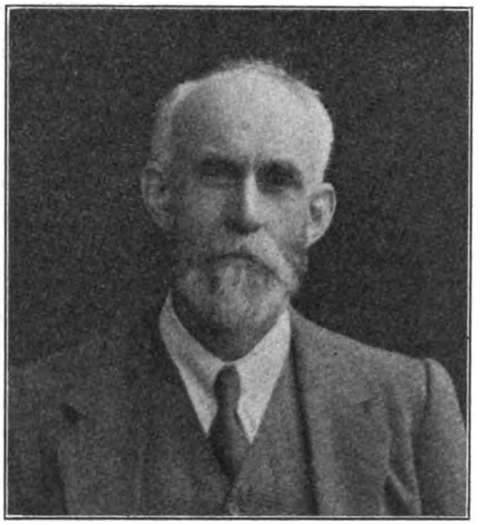
Our audiences responded to this; they studied the service with us; they sympathised with us; they laughed with us and, in the end, they very cordially agreed with us.

CREED & COMPANY'S TELEGRAPH WORKS.

IT is no exaggeration to say that the name of Creed is known throughout the world by every telegraph administration, privately or State-owned, and it was therefore with no little pleasure that the writer recently accepted a long-standing invitation to look over the offices and works of Messrs Creed & Co. Ltd., East Croydon. As will be seen from the photograph the new offices, only completed last year, are strikingly prominent and pleasantly situated at the corner of Cherry Orchard Road, and are another example of the happy and latter-day tendency of works and factories to get well outside the outer belt of the metropolis. There are excellent transport services, and the site was well chosen.

The new building has permitted the extension of the workshop space available made necessary by the steady growth of the firm, but now to the interior!

The ground and lower floors of the new building are occupied by the Administrative and Managerial departments, with the necessary clerical and auxillary services of both, while on the topmost storey is to be found the Drawing Office and accessories. The lighting of the Drawing Office, augmented as it is by special electric illumination is excellent, while all the fittings are well up to date.

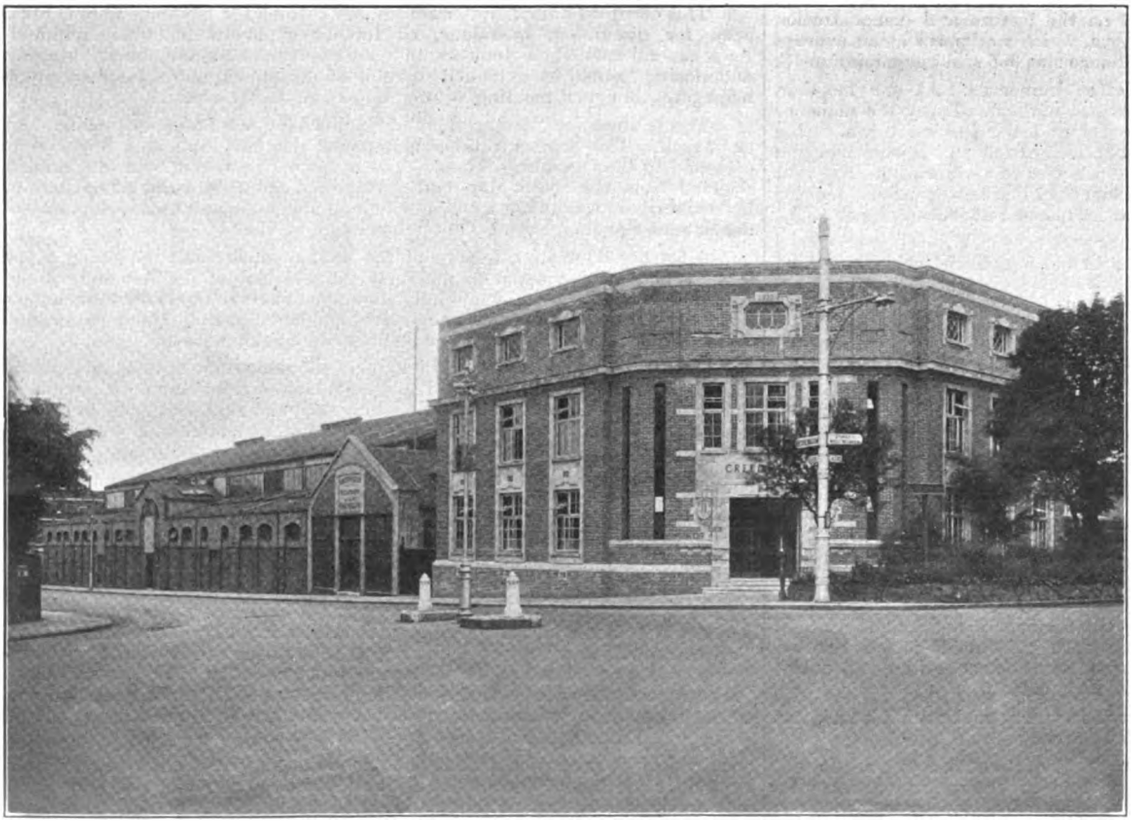


MR. F. G. CREED.

The machine shop, test-rooms, fitting shop, lacquering and electro-plating departments and joinery occupy space at the side or behind the offices and in some cases communicating directly with the latter.

A careful study is made of costs, and if no machine exists on the market for doing a particular job which could be done better and cheaper by that means than by hand, then thinking caps are donned and mechanical means are discovered for mass-production. I was shown an example of this in the case of a complicated cam-shaft (of which a large number were frequently required) the making of one of which by hand would have taken hours, turned out, while we watched the operation, in but a few minutes. This may not appear very wonderful nowadays, and in a large works where thousands are employed one would expect this to be done. The feature that appeared so striking was that a comparatively small engineering works of not more than four hundred employees should possess the organisation and the ready skill to cope with changing needs of this description.

This careful, constant, studious vigilance is a feature



VIEW OF THE NEW OFFICES AND WORKS OF MESSRS. CREED & CO., ADDISCOMBE ROAD, EAST CROYDON.

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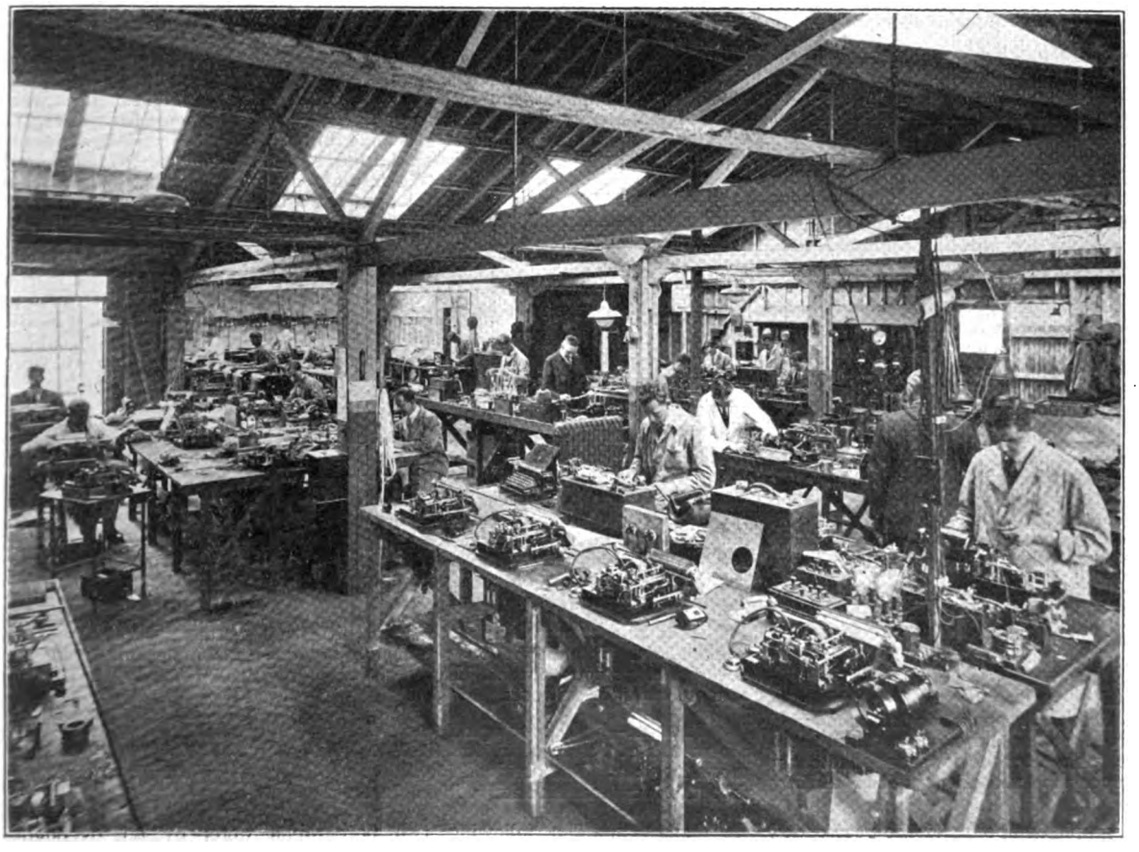
of the Creed organisation ; this close study and critical analysis of every method employed runs throughout the entire works and yet without pressure on any individual, so it would appear.

There is a "hush-hush" room here too ! Therein one can imagine the presiding genius working out new key-boards, new uses for cams and levers, new ways of doing old things and better at that. Yes, one saw one or two odd pieces of apparatus in the Research Room, the Experimental Den, call it what you will, but the writer was a guest, all that he will say is that this corner of the works only showed why the remainder of the machinery went so well. It said as loudly as mute things can speak, "If we don't *know* how or why, then we'll puzzle it out until we do."

In the final test room where apparatus is run for days and days under the most trying conditions to test-out far beyond the normal needs, one saw that these were really individual tests of apparatus not percentage tests, one here and there !

A PORTION OF THE FITTING ROOM.



A CORNER OF THE TEST ROOM.

One thousand relays ? Then one thousand relays will each be tested up to the hilt.

As is well known to most of our readers, Mr. Frederick G. Creed is the Chairman and Managing Director of the Company, while Mr. A. M. Alexander, M.I.E.E., M.Inst. C.E., M.I.N.A., is the General Manager. The latter was at one time Chief Engineer of the Thames Iron Works at the time when that company built the "Thunderer." Mr. F. O. Creed has comparatively recently joined the Company and is in charge of the Sales. The photographs were specially taken for the *T. and T. Journal* by Photographia.

J. J. T.

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TELEGRAPHIC MEMORABILIA.

AFGHANISTAN.—From a French source we learn that the Government of Afghanistan is reported to have lately placed a contract with a French firm for the material for three short-wave radio-telegraph stations. A number of French experts are to be sent out to Afghanistan to establish the system.

AUSTRALIA.—At the end of February, 1928, some 4.23% of the population of the Australian Commonwealth owned 262,363 broadcast radio-telephone receiving licences, other figures announced by the Postmaster-General being as follows :—

	Licences.	*Percentage of Population.*
New South Wales	75,212	3.15
Victoria	136,410	7.86
Queensland	24,813	2.77
South Australia	19,388	3.38
Western Australia	3,820	.98
Tasmania	2,720	1.30

New Station.—Provision has been made in the current year's estimates for the erection of a wireless station on Lord Howe Island, and the preliminary work of selecting a site, &c., is at present being carried out.

CANADA.—A most important development in the use of the short-wave beam system of communication was inaugurated on the 16th of last month, when a beam service was opened between Melbourne and Montreal. This is the first direct wireless circuit between Australia and North America.

According to Reuter's agency at Washington, opportunity was taken for the Governments of the United States of America and Australia to exchange greetings by relaying the same at Montreal by means of short-wave wireless to and from Washington.

A Royal Commission is to inquire into broadcasting throughout Canada, and advise as to its future administration and control. The Government is contemplating control, based on the British system, says *The Times*, with public ownership of all broadcasting stations.

In Parliament recently the Minister of Marine referred to the numerous complaints about existing conditions and the great number of concerns seeking to utilise the limited number of radio channels. He indicated that the way out may be a national system, such as Great Britain has.

Similarly, according to *World Radio*, representatives of Canada have been invited to confer in Washington at an early date on the allocation of short wavelengths used in transoceanic and long-distance radio transmission. The United States Federal Radio Commission is engaged on the preliminary work of establishing a basis for the allocation of short wavelengths among American corporations ; before a final decision is made it wishes to come to some understanding with Canada which will prevent interference between the two countries in transoceanic wireless.

On March 31, 1928, of the 82 broadcasting licences held in Canada 11 were held by newspapers, 8 by religious associations and churches, 19 by radio and electrical firms, a number by broadcasting companies, and the remainder by private individuals, universities, financial and industrial concerns, and 11 by the Canadian National Railways.

The Canadian House of Commons has voted a sum of $250,000 (£50,000) for ship-to-shore radio-telegraph stations.

The technical and lay press in Canada and in Great Britain have made particular point of the fact that the five newly-built cargo ships of the Canadian Pacific fleet are all equipped with apparatus for wireless communication and direction finding. The main installations are 1½-kw. quenched-spark transmitters and two-valve receivers. The transmitters are sharply tuned to 600-, 706-, and 800-metre wavelengths, covering all the requirements of ship-to-ship and ship-to-shore communication over distances of 800 miles. The apparatus is supplied by Marconi. The receivers are adjustable to cover all commercial messages and news broadcast on wavelengths much higher than those normally used by ships. In addition, the equipment is completed by auto-alarms for calling attention to a distress call in the absence of the operator.

CHINA.—Through the *Chinese Economic Bulletin* we learn that the Mukden authorities have done a great deal toward improving old wireless stations as well as installing new ones. There are now 11 stations in such places as Harbin, Mukden, Changchun, Yingkow, Tsitsihar, Suifen, and Yenki. Recently a short-wave wireless station was installed at Mukden at a cost of $600,000, which is capable of sending messages to Europe and America.

When the wireless station at Harbin commenced to communicate with Europe, the Japanese authorities in Manchuria protested to the local provincial government on the ground that it was an evasion of treaty obligations.

COLOMBIA.—Reuter's Trade Service Bogota cables that the Minister of Posts and Telegraphs reports that the telegraph lines in Colombia have been considerably extended during the past financial year, their length having increased from 30,000 to 33,000 kilometres ; at the end of June, 1926, there were only 22,000 kilometres of lines. The new cable service recently established between the port of Buenaventura and Bogota has already increased its messages by 130%.

CUBA.—The report of the Cuba Telegraph Company for the year ended Dec. 31 last shows total receipts of £56,720 (against £58,603 in 1926) and expenses amounting to £33,160 (against £31,250). After providing £5,850 for cable repairs and adding £18,372 brought forward, there remains £36,083. The directors have reduced the value of the investments in the West India and Panama Telegraph Co., Ltd., to £50,000, and are paying a final dividend at the rate of 10% on the preference shares (making 10% for the year) ; a balance of £10,170 is carried forward. In 1926 an interim dividend of 2½%, free of tax, was paid on the ordinary shares.

(See also under WEST INDIES.)

To provide popular broadcast lectures at educational establishments in Cuba, says Reuter's Habana agency, from the university to the smallest school, the Department of Public Instruction is supplying complete wireless sets on loan, with the ulterior intention of presenting them to the schools for permanent use.

CZECHO-SLOVAKIA.—The Department of Overseas Trade is informed by H.M. Commercial Secretary at Prague that an inquiry was held on April 26 concerning the crisis in the wireless industry in Czecho-Slovakia. Representatives of dealers emphasised the fact that the number of listening licences had declined during March by 4,500, during which time 28 new concessions for the sale of wireless apparatus had been given. These facts were stated to be indicative of a general crisis in the industry, and the representatives demanded, as a means of alleviating the situation, that the law relating to wireless should be altered in a more liberal sense, and the broadcasting company reorganised to include representatives of the wireless dealers. On behalf of the Ministry of Posts, Dr. Kucera is reported to have said that the Government was planning an extension of the broadcasting stations. The Brunn station was to be extended in connexion with the 10 years' anniversary celebration. The Prague station was to be strengthened to 50 kw., the Bratislava station was to be strengthened to 12 kw., and a new station of 10 kw. was to be erected in Mahr. Ostrau. It was stated that to carry out the regional system in Czecho-Slovakia would require at least 20 stations, which would both exceed the allowance of stations for Czecho-Slovakia and not be a paying proposition. The following resolutions were passed : (1) The Ministry of Commerce is urged to introduce an amendment of the wireless law (this was supported by Ministerial Councillor D. Kaufmann, of the Ministry of Commerce). (2) The wireless broadcasting company should be reorganised to include representatives of the wireless dealers and amateurs. (3) No more concessions should be granted in places where competition has already become too keen.

DENMARK.—The directors' report of the Great Northern Telegraph Co., Ltd., for 1927 refers to the competition between the cable and radio services. After mentioning that the Russian traffic has diminished owing to the Soviet Government's preference for radio-telegraphy, the directors consider that given equal rates and conditions the cable companies need not fear the competition of wireless telegraphy in its present stage of development ; there is room for both if they work peacefully side by side. To meet competition in the Far Eastern traffic the company has adopted the policy of reducing rates to the level of the radio rates. Further competition is expected from Japan and China. Reference is made to the issue of bonus shares, for which sanction was sought and granted at the annual meeting in Copenhagen on May 30. The accounts show that the receipts were slightly higher, while expenses were reduced considerably. The result was a rise in the net revenue from £271,242 to £360,295. The addition of £192,624 brought forward makes available £552,920. The reserve and renewal fund receives £30,556, dividends and bonus (totalling 20%) absorb £300,000, and a balance of £219,308 is carried forward. The reserve and renewal fund now stands at £3,832,220, and the dividend equalisation fund at £1,059,686.

DUTCH EAST INDIES.—The recently-issued report of the Dutch East Indies telegraph and telephone authorities for 1926 shows that at the end of that year there were 6,777 miles of overhead telegraph lines, 7,571 miles of submarine cables, and 58 miles of underground and other cables in use in the area, the total of 14,406 miles representing 28,352 miles of wires and cables. As regards the telephone service, the number of exchanges has grown from 292 with 35,647 subscribers in 1923 to 308 and 39,355, respectively, at the end of 1926.

EAST AFRICA.—A short-wave wireless service from Great Britain to Kenya and Uganda was opened to the public on June 15. The new service is known as "Kenya Radio" ; the service in Great Britain is worked from Banbury, and in East Africa from a new station erected by the British East African Broadcasting Co., near Nairobi. The rate for deferred telegrams is 9*d.* a word, and for daily letter telegrams 4½*d.* a word with a minimum of 7*s.* 6*d.* As the hours of working are for the present restricted, ordinary (full-rate) telegrams are not yet accepted ; but it is hoped to introduce a full-rate service later.

It is also reported that the British East African Broadcasting Co. (Kenya and Uganda) is to commence broadcasting programmes locally during the present month. Kenya is the first British colony to possess a short-wave broadcasting station.

FRANCE.—The Compagnie Générale de Télégraphie Sans Fil records net profits of 9,209,000 fr. for 1927, as compared with 8,507,000 fr. in the preceding year. The dividend for 1926 was 50 fr. per share, and it is expected that the same distribution will be made for 1927.

GERMANY.—The following two paragraphs were, by an oversight, omitted from our last issue, but may be usefully read, especially the second

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paragraph in connexion with the feat of Lieut. Jouy, under "France" in the June issue :—

> The German Lufthansa (Aviation) Company announces a gross profit for the past year of close on 7,000,000 marks (£350,000). The greater part of this sum is applied to settlements and depreciations, whilst the balance of £950 is placed to reserve.
>
> Germany has been divided for the purposes of aviation into 14 areas, each with a wireless station, thus enabling pilots to obtain weather information on their bearings at any time. *In the case of 'planes on regular services the pilots must communicate their location when the "frontier" between two areas is crossed, not only to the station in the area which has been entered, but also to the station in the area which has been left.* Position must also be wirelessed to the nearest station after every start and before the landing. The 'planes of the Lufthansa on 17 routes will all be equipped with wireless apparatus this summer.

Reuter's Agency, Cologne, states that under a scheme for providing poor blind persons and institutions for the blind with wireless sets, the German Post Office authorities have collected nearly £30,000, in addition to gifts of apparatus. The German State does much for the help and comfort of its blind population.

GREAT BRITAIN.—*Parliamentary Questions.*—On May 14, Mr. Baldwin informed Mr. W. Baker that it was not possible to forecast when the report of the Imperial Wireless and Cable Conference would be available. He understood that the deliberations of the Conference would not be concluded for some little time. As soon as he was in a position to do so he would make a statement.

On May 21, Mr. W. Baker raised the question of the Imperial wireless and cable services. He said that the Labour Party feared that a very dangerous situation to the nation and Empire was about to arise, if it had not already arisen. They understood that it was proposed to transfer those services to private ownership and control. His great fear was that a recommendation had been agreed to by the Imperial Wireless and Cable Conference, and that that recommendation, based on a provisional decision, had been submitted to the Dominion Governments, and that when they signified their acquiescence the House of Commons would find that the bargain had been concluded and that its hands were absolutely tied. The Prime Minister had stated that he had no previous knowledge of, and no financial responsibility for, the financial merger, which was a definite calculated attempt to force the hands of the Government. The Marconi Company knew how great were the potential profits of the Government beam service. The cable companies were frankly afraid of the success of the "beam," and they entered into the financial merger because they saw no other way of escaping from that competition. The proper course for the cable companies would have been to try to reduce their profits in order that the commercial users might get the best possible service at the lowest possible price. The country was being asked to hand over its Imperial telegraph communication to two groups, one of which had a record for mismanagement and widespread international combinations, and the other of which stated that it could not stand up against Post Office competition, and threatened to scrap its plant and cables.

In the debate which followed, Sir Hamar Greenwood said there was no doubt that the conflict between the beam system, owned by the Post Office, and the Pacific Cable Board, must lead to a certain amount of irritation. Until those systems were transferred to private enterprise there would always be irritation. Mr. Ammon also spoke.

Sir J. Gilmour, the Chairman of the Conference, replied, and dealt in detail with the work which the Conference had already carried out. He said that there had been 30 meetings of the full Conference. They had had to consider not only of how the affairs of this country would be affected, but what repercussions it was likely to have in the Dominions and elsewhere. During the sitting of the Conference the merger between the cable companies and the Marconi Company was announced. This proposed merger, for which the Government had no responsibility, was made subject to satisfactory arrangements being made with the British Government and the Governments of the Dominions and India. The possible reactions of this merger on the problem referred to the Conference had to be examined in great detail, and had necessarily been the subject of conversations between the representatives at the Conference and the companies concerned. The Conference was still in being, and it was quite impossible to say how soon it would conclude its proceedings. The Conference had power only to make recommendations to the Governments concerned, and before any definite action was taken the matter would be brought before the House of Commons.

On May 22 Sir R. Hutchison asked the Postmaster-General whether he could now make any further statement about the possibility of furnishing a high-power broadcasting station in Scotland, preferably in the Midlands, which could supply transmission to the more remote and distant parts of Scotland.

Sir W. Mitchell-Thomson said that the British Broadcasting Corporation had a scheme under which the existing broadcasting stations would be replaced by a small number of regional high-power stations. As the first stage in this scheme, a high-power station would be erected near Potters Bar, but as the scheme was still in the experimental stage, he could not give any forecast of its future development in Scotland or elsewhere.

On May 22 Mr. Malone asked the Postmaster-General whether his department had been kept informed of the progress made in the development of television; and whether, seeing that this invention must necessarily function in conjunction with the national broadcasting services, he proposed to amend the licence and agreement under which the British Broadcasting Corporation now functioned so as to permit that body to employ television.

Sir W. Mitchell-Thomson said that the answer to the first part of the question was in the affirmative. With regard to the second part, he was advised that television was still in the experimental stage, and he did not consider that the time had yet come to make arrangements for the provision of a public service.

Bristol.—A complaint from the M.P. for East Bristol regarding the interference of broadcasting reception by the overhead trolley-wheel system of electric trams in that city has been replied to by the B.B.C. to the effect that experiments are being made in other towns and it is therefore considered necessary to await the result of these trials before making any suggestions

The Wireless Correspondent of the *Daily Telegraph*, in this connexion, says that as a result a device has been discovered which promises to mitigate the nuisance. Several authorities have undertaken to test it in practice. The interference has drawn complaints from various parts of the country ever since broadcasting commenced.

The B.B.C., gaining experience from Vienna, has found a way of greatly reducing this sparking. It is hoped that the method will prove inexpensive and efficient. Exact details are being withheld until the efficacy of the plan has been demonstrated.

Edinburgh.—While a train travelling from London to Edinburgh at over 50 miles per hour, and carrying 300 Scotch Australians on a "Home" visit, in the guard's van, fitted with head-phones and a special wireless receiver, 3LO, Melbourne, was very distinctly heard to say "Greetings from the Melbourne studio to the Scottish delegation." This was succeeded by excerpts from the news of the day, musical items and a gramophone record of a Lauder song. This, said a Press representative, "in spite of every impediment, time, distance, speed, atmospherics and the rattling of the train."

It was reported from New York towards the end of last month, that the International Telephone and Telegraph Co. was in negotiation for the acquisition of the communication business of the Radio Corporation of America (that is its interests apart from manufacturing and broadcasting). Should the negotiations be successful, the Telephone and Telegraph Co. would control practically the whole of means of communication in the Western Hemisphere. The president of the Radio Corporation has emphatically denied that there have been any negotiations with the stated end in view, and points out that the United States law would require alteration before sanction could be given to a combination of radio and telegraph companies.

The B.B.C. has recently completed the latest addition to the London studios at Savoy Hill, bringing the number now in use up to nine. No. 9 studio is 22 ft. long by 19 ft. 6 in. wide; its solid brick walls are covered with four layers of hessian cloth, the layers being separated one from another by wood battens half-an-inch thick. In front of this is a framework carrying a special acoustic boarding, half of which is covered with felt half-an-inch thick, prepared to carry the decorative wall panels with which the remainder of the boarding is also treated. The concrete ceiling is partially covered with felt in such a way that its presence is unnoticed by the eye, it being broken into panels which form a pleasing effect in the general decorative scheme. Ducts emit fresh air and extract the vitiated air by artificial means. The decoration of the studio is a complete innovation: the room is painted in red, black and gold, and its walls bear a pictorial scene of Chinese character in which the phoenix forms the theme. The studio has proved to be best suited for instrumental soloists and combinations up to an octet. It will not be used for speech, and announcements will be made from the observation chamber outside the studio.

Not one, probably, in a thousand listeners-in ever give a thought to the skill, the ingenuity and the knowledge of the many branches of science necessary before a brick can be laid or even a plan placed on paper for the erection of an ordinary audition chamber, and the above presented many problems for solution before the plans could be passed with confidence.

"Beam" Developments.—It is understood, says the *Electrical Review*, that further important developments may be expected shortly, as Marconi's Wireless Telegraph Co., Ltd., is nearing the completion of experiments for the simultaneous transmission of wireless telephony and wireless telegraphy on the "beam" system. According to the daily Press, tests are taking place across the Atlantic with apparatus which it is claimed will operate two high-speed telegraph circuits simultaneously with one duplex telephone circuit, utilising the same transmitter and aerial and only one wavelength for all three circuits. It is also reported that the company is building an experimental plant at Poldhu, Cornwall, for a "swinging beam." The angle of the "beam" is reduced to eight or nine degrees, and it can be swung to serve any distant point with which communication is desired. In this way a single transmitting station can provide a "beam" service to a large number of countries. The "beam" may be "swung" in 60 seconds and the reflector, which is the important component of the "beam" transmitter, will be revolved, so that a message can be sent in any direction.

The *Daily Telegraph* supplements this by the following, which rather accentuates the "broadcasting" possibilities, thus :—

> Two series of Marconi experiments, revealed lately, have an interesting bearing on this question of Empire broadcasting. Senatore Marconi himself is about to test the possibilities of a revolving beam station, while telephony has been superimposed with great success on the existing beam telegraph service to Canada. Another possible solution of Empire broadcasting therefore presents itself. A central revolving beam station might transmit, at the most suitable hours,

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to each of the Dominions in turn. The telephony tests with the beam suggest that there should be no great difficulty in using it for wireless programmes. Captain Eckersley, the chief engineer of the B.B.C., favours the use of the beam for Empire transmissions.

It is stated that Mr. J. L. Baird has now completed his new television station in Long Acre, London, and anticipates that he will be in a position to broadcast moving pictures in the early autumn. The new station, 2TV, works on 200 metres.

HAITI.—There are now 1,490 miles of telegraph and 4,608 miles of telephone wires in operation in the Republic of Haiti, as compared with only 950 and 2,860 miles, respectively, in 1924.

INDIA.—The annual report of the Indian Post and Telegraph Department for 1926-27 shows that telephony is increasing in popularity. According to the *Times*, the Department is frank about its achievements, for it states that ". . . the trunk service between Bombay and Delhi was at times satisfactory," but between Bombay and Calcutta "good commercial speech . . . was not always reliable." The former loss of Rs. 4,91,275 (£36,825) has been converted into a profit of Rs. 1,34,745 (£10,125).

As regards the Telegraph Service, the report records the passion of Burmese boys for maliciously damaging telegraph insulators, that of their elders for stealing copper wire, and the loss on this service of Rs. 12,72,332 (£95,400) against only Rs. 6,93,846 (£52,250) the previous year!

MALTA.—The special correspondent of the *Daily Telegraph* last month gave some intensely interesting particulars of the wireless-controlled manœuvres by means of which an obsolete vessel, the "Centurion" was entirely controlled by means of wireless from an attendant "destroyer." The correspondent records that: "The control system resembles automatic telephones; turning the dials on the destroyer to 039 calls up 039 in the automatic exchange on board the Centurion, which sets the desired machinery in motion. If by any chance one figure failed to register, the desired result would not be obtained, or the vessel might go astern instead of altering course; but the controls were wonderfully perfect here until a few days prior to the date of this report, when they failed to reduce speed after the manœuvres, and the crew had to board the vessel when going at 14 knots instead of at the usual three or four knots."

NEW ZEALAND.—The Wellington correspondent of the same London newspaper also recorded that: "Radio enthusiasts here heard the British Broadcasting Corporation's transmission of the song of the nightingale from Pangbourne most successfully on May 29. The transmission was not loud, but it was quite clear, and was audible through a loudspeaker."

NICARAGUA.—A recent report from H.M. Consul at Managua to the Department of Overseas Trade on the economic situation of the country includes the following information relative to the telegraph and telephone services, which are operated by the Government:—

Telephony.—There were 53 public telephone offices in 1926 and 1,200 km. of telephone wire; 1,094 telephone instruments were in use. The service between Granada, Managua León, Chinanadega and Corinto, which are the principal stations on the Pacific Railway, is, on the whole, good, but telephone connexion from any of these cities to the smaller towns of the interior is poor.

Telegraphy.—In 1926 the total length of lines was 2,840 km. The service is fairly satisfactory.

Submarine-cable Telegraphy.—The All-America Cable Co. provides an efficient service.

Radio-telegraphy.—The Tropical Radio Telegraph Co., a subsidiary of the United Fruit Co., possesses a powerful station in Managua with a 20-kw. output and two small branch stations with 1-kw. outputs at Bluefields and Cabo Gracias. The Managua station transmits direct to New Orleans and Miami, and the other two have only a small radius of about 500 miles. The rates and service compare very favourably with those of the Cable Company.

PANAMA.—(See WEST INDIES.)

PERSIA.—Reuter's Teheran Agency cables that it has been decided to erect new telegraph lines where necessary and to extend existing lines to the Russian and Turkish frontiers; about a thousand miles of new lines will be needed, and most of the material has already been purchased in Russia.

RUMANIA.—The *Electrical Review* records that "a new broadcasting transmitter is to be erected by the Marconi Company at Bucarest this year, the building of which will bring the number of countries in which such plant is being used up to 20. The Bucarest station will be operated by a recently-formed national company to which broadcasting rights in Rumania have been ceded; its working wavelength has not yet been decided, but the transmitter has been designed to broadcast on any wavelength between 200 and 545 metres. It will have a rating of 12 kw. unmodulated energy to the aerial system, and will incorporate several new features. Before 1925 the use of private wireless sets was practically unknown in that country, but since the removal of restrictions a wide demand has grown up among amateurs and would-be listeners for a national broadcasting system; several wireless clubs have for some time been doing experimental work."

RUSSIA.—The Moscow correspondent of Reuter's Agency states that though there are now 77 wireless stations in the Soviet Union, with a total capacity of 180 kw., the increase in the number of receiving sets, whose number in the first quarter of this year was 200,000, does not correspond with the rate of development of the network of wireless stations. Accordingly, it is proposed to reduce the number of wireless stations, increase the power of those that will be left, and cheapen the price of receiving sets, so as to encourage wider distribution. Prof. Bonch Bruyevitch has produced plans for the construction of a central super station of 1,000 kw., whose range of transmission will be between 800 and 1,000 miles. The Wireless Friends Society has a membership of some 200,000 amateurs and has 80 branches. As many as 80 wireless periodicals are published in the Soviet Union. From March, 1927, one section of the Wireless Friends Society has been engaged in receiving and transmitting on short waves.

SOUTH AFRICA.—A Cape telegraphist, writing in the staff organ of the South African Telegraphs, has recorded a very high opinion of the staff of the Beam Office in Cape Town. "Their typists are typists," he says, "and to see them at work is a real experience."

The *Electrician* reports as follows on wireless matters in South Africa: "The radio market in South Africa seems at present to be one for complete sets rather than for components. It is estimated that there are some 16,000 licensed receivers. The Union Broadcasting Co. is operating four stations, the wavelengths of which all fall within the recognised broadcasting waveband of the country. The chief demand for both sets and components is for those the wavelengths of which all fall within the recognised broadcasting waveband of British or American manufacture, while loudspeakers of the cone type are becoming increasingly popular. Battery eliminators for 200/240, 50-cycle supply are becoming commonly used. There is a good demand for relatively cheap receivers and the British sets seem to have attained extraordinary popularity over German and American designs, chiefly on the basis of simplicity of operation. The operation of only four broadcasting stations in the Union makes the finer selectivity of this country unnecessary, with the result that the cheaper British product with its few controls is favourably received, against the more complicated and unnecessarily selective American sets.

"It is the intention of the African Broadcasting Co., Ltd., to completely cover the Union with their depots, and this company is already representing British, German and American manufacturers. Although some improvement in the general demand for radio equipment may be expected in South Africa, one can not be too sanguine in contemplating immediate sales. Every effort will, it is believed, be made by the present broadcasting controlling organisation to bring about wide appreciation of radio. The progress will necessarily be slow, and any greatly pronounced sale of complete sets is dependent on its success. The key to the situation lies with the agricultural populace, and upon their demand for radio entertainment rests the immediate future of radio equipment. The completion of the new station at Johannesburg will also, it is hoped, stimulate further sales."

SWEDEN.—From Stockholm, through Reuter's Trade Service, we learn that statistics of the number of wireless receiving licences valid in Sweden in April show a fresh increase during the month to 360,059, or 59.1 per thousand of the inhabitants of the country.

SWITZERLAND.—*A League of Nations Experiment*.—The Secretariat of the League of Nations is making a series of experiments in the broadcasting of speeches to extra-European countries. A microphone at the Palais des Nations at Geneva, Switzerland, is coupled, by means of an international telephone circuit placed at the disposal of the Secretariat by the German and Swiss administrations, with the short-wave wireless telephone transmitter of the Dutch Government at Kootwijk, in Holland. Speeches in several languages were being transmitted between the hours of 3 and 4 p.m. (Greenwich time), starting May 16. The Kootwijk station has a power of 25 kw. and a wavelength of 18.4 metres, and is heard with surprising regularity in the Dutch East Indies. The Information Section of the League will welcome reports, particularly from distant parts of the world, as to the quality of the reception of the experimental transmission.

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MR. ROBERT WATSON,

a telegraphist of the South African Telegraph Service, and member of the British Astronomical Association, discoverer of Nova Pictoris. Mr. Watson is stationed at Beaufort West.

The *Daily News* recently recorded from Geneva the introduction at the International Labour Conference there of an arrangement by which each delegate was able to hear whatever speech was being delivered in his mother, instead of in the foreign, tongue of the speaker.

The following, from the *Electrical Review*, is a very lucid but slightly abridged description of the means by which this is done:—

"Around the rostrum, within sight and earshot of the speaker, sit a number of interpreters, each speaking a language different from the orator's and his neighbours; each interpreter is provided with a light microphone encased in rubber sponge, so as to be free from unnecessary vibration, and

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so "damped" that it is sensitive only to the subdued voice of its user, and not to that of the orator proper or the noises of the Conference Hall. Coupled to the microphones are amplifiers and distributing circuits leading to the various tables, where electrically-operated diaphragms feed the headpieces with a reproduction of the interpreters' voices

"The task of the interpreter is to provide a running translation of the speech being made in the language in which he specialises, and it is claimed that immediate interpretation (the translation is never more than a sentence behind the speech being translated) appears to be far less fatiguing and less prone to error than an interpretation from memory or shorthand notes. The listener at a table in the Conference Hall places over his ears stethoscopic earpieces, turns a switch until the indicator points to the language in which the listener is interested, and then, by means of a knob, controls the strength of the speech. All other manipulations are in the hands of the interpreters, and are confined to lifting the microphone from, or to, a hook which is a master switch. The headpieces are well ventilated and will be sterilised by a routine process. One can sit quite close to an orator and yet receive, without noticeable interruption, not the voice of the orator himself, but the translation of a chosen interpreter.

"At the recent Conference arrangements were made to test a combination of this system with one for making permanent records of the speeches delivered, which can be transported easily to the International Labour Office for transcription by the normal staff, and can be kept as a check in case of dispute. It is also probable that at a later meeting a short-wave telephone relay between the Conference Hall and the permanent staff at the "Palace of Labour" may be developed to save even the time which would be lost in transporting permanent speech records over a distance of about 2½ miles."

A conference of the Council of the Union Internationale de Radiophonie, under the presidency of Admiral Carpendale, and a European Conference of Broadcasting Engineers have concluded their sittings at Lausanne. The Council ratified the admission of new members to the Union as follow: Radio Stanica, Zagreb; British East African Broadcasting Company, Nairobi; Société Roumaine de Radiophonie, Bucarest. The Council recommended that the identity of broadcasting stations should be stated as clearly as possible. Some twenty European countries were represented at the Engineers' Conference, when discussions took place on the methods of eliminating interference with broadcasting by tramcars, lifts, and other electrical apparatus, and on the latest experiments in short-wave transmission. The technical conditions indispensable to the relaying of programmes over long distances by means of telephone lines and cables were also examined. The sittings concluded with the annual general assembly of the Union, when the members of the Council were re-elected, and the latter body afterwards re-elected as its president Admiral C. D. Carpendale (Great Britain) and as its two vice-presidents Herr H. Giesecke (Germany) and M. R. Tabouis (France); M. M. Rambert (Switzerland) was re-elected Council delegate. A new Commission to deal with problems affecting international relays by wire and wireless was appointed under the presidency of M. S. Chamiec (Poland).

U.S.A.—Reuter's Trade Service announces from New York that three radio beacons on Long Island Sound were put into operation in May last by the Lighthouse Service of the U.S. Department of Commerce to guide ships having the necessary equipment in foggy weather. The beacons are at Execution Rock lighthouse, east of Hell Gate Bridge at the western entrance to the Sound; at Stratford Shoals light, off Bridgeport, Conn., and at Little Gull Island light, southwest of New London, Conn. The automatic transmitting sets broadcast dots and dashes which navigators utilise to locate their exact positions; each beacon has its identifying series of code characters which ships' radio operators intercept on direction finders.

The two next following paragraphs should be read in connexion with paragraphs 4 to 8, inclusive, under "U.S.A." in the June issue.

The American Telephone & Telegraph Co. and the International Telephone & Telegraph Co., says the *Financial News*, are planning a radio-telephone link, to open in the spring or summer of 1929, between New York and Buenos Aires.

The Federal Radio Commission, according to the *Electrical Review*, has allocated 20 short wavelengths to the American Publishers Committee for the special use of the Press when transmitting news transoceanically. The Commission granted the Mackay Co. fifteen wavelengths, instead of the 19 requested, and also granted the Radio Corporation 15 channels, instead of 55.

The same authority also states that the Federal Trade Commission has issued a complaint against the Radio Corporation of America, charging it with creating a monopoly in radio valve grades and with unfair competition in entering into certain licence agreements with other radio manufacturers.

Wireless, and trains a mile in length!—Promising results are being secured by the use of radio intercommunication on long freight trains in America, as shown by tests now in progress on the Chesapeake and Ohio Railways, according to the Westinghouse Electric and Manufacturing Co. The system is in service on the James River subdivision, where it is being tried because ordinary signalling is very difficult under the conditions that obtain in that mountainous region. The line has many curves and several bridges and tunnels, and is so tortuous that engine and "caboose" are rarely in sight of each other and often on opposite sides of a mountain, so that signalling by hand or lantern is generally out of the question. Trainmen usually have to walk within signalling distance in order to enable trains to make the proper movements, and since the trains are upwards of a mile long, much time is lost by this process. Radio signalling between engine and "caboose" saves so much time in various ways that a considerable fuel saving per trip is made, not only by the train equipped with radio, but by all trains whose movements are dependent on the radio-equipped train. A transmitter and receiver, with a loudspeaker, are mounted on both the engine and the "caboose," and complete vocal intercommunication is maintained on the entire trip: clear loudspeaker volume is normally maintained, though there is a little, but not serious, fading when passing under trussed steel bridges. In tunnels, between high bridges, beside high cliffs, and in deep cuttings, fading is more pronounced, though communication is always maintained by means of headphones; it is, however, not difficult to correct this trouble at the points where it is serious. The range of the system is several miles, so that even the parting of the train does not sever communication.

According to *Science*, the Bell Telephone Laboratories, New York, have devised certain accurate electrical instruments which with psychological aids, determine a person's exact degree of hearing, and the fact is recorded here in case such apparatus should prove useful to my friends on the Telephone side in testing the hearing powers of recalcitrant complainants! A push-button measures the tone emitted for the test, which can be instantaneously applied to one or other ear or both. Should the person under test maintain that he hears nothing, and should this statement be inaccurate he would quickly be detected because the eye nearest to the ear involved would involuntarily blink slightly at each push of the button and thus unmask the deceiver!

WEST INDIES.—The receipts for the past year of the West India & Panama Telegraph Co., Ltd., totalled £56,522, and the working expenses £54,277, leaving a credit balance of £2,245. After meeting debenture interest, depreciation and renewals there is a deficit of £6,196, which, added to that brought forward, makes a total debit of £127,534.

(See also under CUBA.)

Personal and General.—The annual summer meeting of the Students' Section of the I.E.E. will be held in Holland and Western Germany. The party will leave London on July 28 for Rotterdam. Visits have been arranged to works at Rotterdam, Eindhoven and Utrecht, and a pleasure trip to the Hague. In Germany visits have been arranged to works of engineering interest at Essen, Dusseldorf and Cologne. The party will return from Cologne on Aug. 6, arriving in London on Aug. 7. If possible, a visit will be arranged to Cologne broadcasting station.

The following gentlemen have been nominated by the Wireless Section Committee of the I.E.E. to serve on the Committee from October, 1928: *Chairman*—Commander J. A. Slee; *Ordinary Members*—Mr. F. W. Davey, Lieut.-Col. A. G. Lee, Mr. E. B. Moulin, and Mr. P. K. Turner. The following gentlemen will continue to serve as members of the Committee: The President, I.E.E.; the Chairman of the Papers Committee, a nominee of the Council, a nominee of the General Purposes Committee, Major B. Binyon, Capt. P. P. Eckersley, Dr. R. V. Hansford, Mr. J. Hollingworth, Mr. S. R. Mullard, Mr. G. H. Nash, Mr. C. E. Rickard, Mr. G. Shearing, together with one representative each to be nominated by the Admiralty, Air Ministry, General Post Office and the War Office.

The I.E.E. premiums for wireless papers during the session 1926-27 were awarded to the following: Prof. E. V. Appleton, Lt.-Col. A. G. Lee, G. W. N. Cobbold and A. E. Underdown.

One most deeply regrets to note the enforced retirement of Mr. H. A. Bolton, Superintendent, Inland C.T.O., on the 4th ult., and who had only received that well-deserved promotion less than twelve months ago. His sturdy character will be missed by a host of colleagues who have known him for years as one without reproach. It is sincerely hoped that rest and freedom from official stress and strain will go far to alleviate the physical drawback which has occasioned so unfortunate a premature disappearance from G.P.O. West.

By the time these lines see print Messrs. J. A. May and Mr. G. E. Day, Asst. Supts., and Mr. F. W. T. Sillence, Overseer, will also have signed on for the last time. To all, the best of wishes for a good time.

Yet again one has to strike the regretful note, for Mr. J. L. Harris and Mr. R. J. Matthews, both old members of the Foreign Telegraphs, who have also been compelled to retire from the service owing to ill-health. The kindliest of kind wishes follow them and the sincerest hopes that at least a very sensible alleviation will be the result of this enforced rest.

Interesting Items to Read.—Report of First General Meeting of the Television Society, *Television*, June number.

First Annual Report of the British Broadcasting Corporation. H.M. Stationery Office, price 3*d*.

Carrier-Current Telephony over Power Transmission Lines. *Electrical Review*. May 18.

The Broad View.—No one can have a firm grasp of any science by *confining* himself to it. He may, no doubt, work at the details of his subject; he may be useful in adding to its facts; he will never be able to enlarge its philosophy. The philosophy of every department of science depends on its connexion with other departments and must therefore be sought at their points of contact.—*Buckle.* J. J. T.

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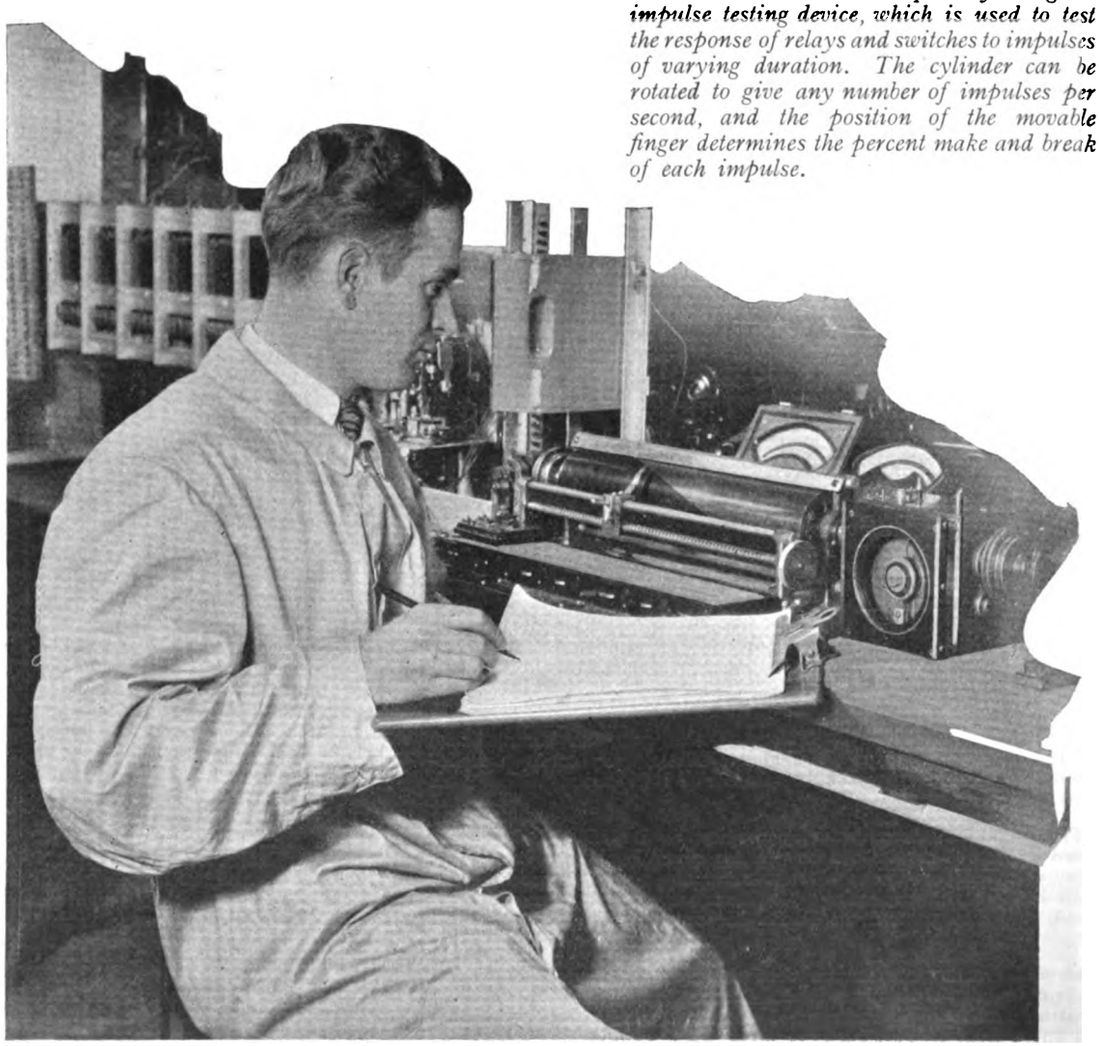
Thirty-five Y

The illustration shows a specially designed impulse testing device, which is used to test the response of relays and switches to impulses of varying duration. The cylinder can be rotated to give any number of impulses per second, and the position of the movable finger determines the percent make and break of each impulse.



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Experience.

THE Research and Development Department of Automatic Electric Inc. has been a continuous and important factor in the growth and success of the company since the very first days of its inception. Its function at first was to make practicable and workable what was then but a vague and nebulous idea; its function since that time has been to constantly improve and perfect the automatic idea, always having for its aim a more convenient, more rapid and accurate telephone service at the lowest possible cost.

As a consequence, Automatic Electric Inc. has an asset to which few other manufacturers can lay claim. This is, thirty-five years of experience in meeting and solving the problems which have faced the progress of the art of automatic telephony. Its Technical Staff, whose record of accomplishment bears convincing testimony to its ability, can be confidently relied upon to cope successfully with the problems of the future with the same ingenuity and resourcefulness that they have with those of the past.

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The
Telegraph and Telephone Journal.

PUBLISHED MONTHLY IN THE INTERESTS OF THE TELEGRAPH AND TELEPHONE SERVICE. UNDER THE PATRONAGE OF THE POSTMASTER-GENERAL.

Editing and Organising Committee - - - J. STUART JONES. W. D. SHARP. J. F. STIRLING. W. A. VALENTINE. J. W. WISSENDEN.

Managing Editor - - - W. H. GUNSTON.

NOTICES.

As the object of the JOURNAL *is the interchange of information on all subjects affecting the Telegraph and Telephone Service, the Managing Editor will be glad to consider contributions, and all communications together with photographs, diagrams, or other illustrations, should be addressed to him at the G.P.O. North, London, E.C.*1. *The Managing Editor will not be responsible for any manuscripts which he finds himself unable to use, but he will take the utmost care to return such manuscripts as promptly as possible. Photographs illustrating accepted articles will be returned if desired.*

VOL. XIV. JULY, 1928. No. 160.

DOXOLOGY.

IN the interesting account of the series of lectures and demonstrations dealing with the telephone service with which he entertained and instructed Glasgow business men in the teeth of the rigours and caprices of a Scottish winter, Mr. Coombs relates that at the conclusion of one of the meetings the Chairman remarked : "Now that the Post Office people have finished, let us all sing the doxology." He observes that this expression might have been misunderstood, although the good intention of the speaker was evident. We hardly think, however, that there was any occasion for misunderstanding. When the creature is moved by piety or gratitude to his Creator to sing : "Praise God from whom all blessings flow," he usually intends to render solemn thanks for blessings received ; his doxology certainly does not express : "Thank Heaven, that's over !"

We shall not, we hope, be accused of complacency if we suggest that telephone subscribers in these days have good reason to sing doxologies, and this not for benefits peculiar to the Post Office system—although the Post Office may well claim to be in the forefront in adopting all the succeeding improvements in the telephone art—but because of the enormous strides which have been made in technique, and the manifold developments of the usefulness of the telephone which have been achieved even in comparatively recent years. Consider the subscriber of only 20 years ago, a date at which many business men of to-day, not yet old, had had many years' experience of the telephone. In 1908 the local systems of many important towns were still carried on overhead routes : common battery exchanges were the exception and not the rule : the limits of trunk speech were circumscribed and uncertain, and, in consequence, the range of telephonic communication was limited compared with that enjoyed by the subscriber of to-day. The subscriber of 1908 could speak to some 500,000 people in Great Britain, to some tens of thousands more in Paris, Lille, Brussels, Antwerp and a few other places in France and Belgium. The discovery of the thermionic valve and the employment of radio telephony in conjunction with the physical systems of countries on both sides of the Atlantic has changed all that. The subscriber of 1928 has a telephone at his elbow which will not only place him in rapid communication with a million and a half of his fellow countrymen, but also with upwards of 19 millions in North America and 5½ millions on the continent of Europe—an ever-extending field. And this communication is not precarious or uncertain. The main trunk routes to-day in this country and on the Continent are carried in underground cables and furnished with powerful repeater stations at regular intervals ; and the transatlantic service, despite the vagaries of atmospherics, is in general marvellously clear and reliable. Setting aside the more dramatic occasions when it is used to summon a doctor, a policeman or a fire brigade, the telephone is, even in the prosaic moments of life, an unfailing servant, a repairer of omissions, an aid in petty distresses, an indispensable point of contact with the near and distant world. That subscribers who, besides enjoying its benefits, have been initiated into the mystery of its working, and enabled to appreciate the intricacies of the daily and hourly care and study expended on it, should feel inclined to intone a doxology is, we think, no matter for wonder.

To revert to our original text, we may say that a course of lectures or demonstrations, such as those inaugurated by Mr. Coombs, must be of incalculable benefit to the subscribers and to the Service ; for with knowledge grows sympathy and understanding, and the resultant better operating at the subscriber's end conduces greatly to the improvement of the Service as a whole. We are convinced that the attitude of the majority of subscribers to the Service is friendly ; further developments on the lines indicated by Mr. Coombs would tend to make the unfriendly minority become infinitesimal.

HIC ET UBIQUE.

Among the Birthday Honours are noted the following with special interest and gratification : The C.B.E. to Mr. F. J. Adye, Secretary of the Pacific Cable Board, and to the Postmaster-Surveyor of Liverpool, Mr. Simpson ; the O.B.E. (Civil Division) to Commander F. G. Loring, R.N. (Ret.), Inspector of Wireless Telegraphy ; the M.B.E. (Civil Division) to Mr. J. D. Brown, Traffic Accountant to the P.C.B. Also the M.B.E. (Civil Division) to Mr. W. H. King, Asst. Engineer, Indian Post and Telegraph Service ; while the much-respected Mr. M. G. Simpson, Director-in-Chief of the Indo-European Telegraph Department receives the C.S.I. Mr. G. Slater, Controller, and Miss Marwood, both of the Money Order Department, receive the I.S.O. and O.B.E. respectively.

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We have received a considerable number of papers from our readers on the subject of the "*Elimination of Waste.*" These papers are engaging the attention of the Editing Committee and it is hoped to announce the names of the prizewinners in the August issue.

THE telephonic development of the six largest telephone-using countries in the world at Jan. 1 last (with the exception of Japan, statistics of which are not yet to hand) was :—

	Telephones.
United States	18,523,500
Germany	2,814,996
Great Britain	1,633,802
Canada	1,265,869
France	883,406
Sweden	466,787

Japan would come between France and Sweden with upwards of 650,000 telephones.

As anticipated in our June issue, a telephone service between this country and Portugal, via Madrid, was opened last month. It is available from all parts of Great Britain, but will be restricted initially in Portugal to calls to or from Lisbon.

The charges for a 3-minute day call from London to Lisbon is 17*s.* 6*d.*

On Friday, June 8, telephone service was opened between all parts of this country and Gibraltar, via Madrid.

The charges for a 3-minute call between London and Gibraltar is 17*s.* 9*d.* (day) and 10*s.* 9*d.* night.

The Anglo-Czecho-Slovakian service, hitherto in operation between all places in this country and Prague and Aussig (Usti nad Labem) only, was extended on June 7 to the whole of Bohemia, Moravia, Silesia and the western part of Slovakia. The service will be further extended to Eastern Slovakia as soon as technical conditions permit.

As from June 4, the Transatlantic Telephone Service was open from 11.30 a.m. to 3 a.m. (British summer time)—an extension of one hour daily in the hours of service.

Telephonic communication with the Sarre District was opened on June 28. The charge for a day call between London and Saarbrücken is 7*s.* 9*d.*

International trunk communication is extending rapidly in South America. Circuits connecting Monte Video (Uruguay), Buenos Aires (Argentine) and Santiago (Chile) arranged by the International Telephone & Telegraph Corporation in co-operation with Argentine, Chile, & Monte Video Telephone Companies were opened last month.

PROGRESS OF THE TELEPHONE SYSTEM.

The total number of telephone stations working at April 30, 1928, was 1,638,567, representing an increase of 7,376 on the total at the end of the previous month.

The growth for the month is summarised below :—

	London.	Provinces.
Telephone Stations—		
Total at April 30	581,172	1,057,395
Net increase for month	2,850	4,526
Residence Rate Subscribers—		
Total	134,450	213,417
Net increase	1,230	1,511
Call Office Stations (including Kiosks)—		
Total	5,245	18,959
Net increase	21	129
Kiosks—		
Total	927	3,913
Net increase	40	113
Rural Party Line Stations—		
Total	—	10,193
Rural Railway Stations connected with Exchange System—		
Total	—	909
Net increase	—	19

Further progress was made during the month of May with the development of the local exchange system. New exchanges opened included the following :—

LONDON—Fairfield (Croydon), Temple Bar,

and among the more important exchanges extended were :—

LONDON—Ealing, Erith, Wembley.

PROVINCES—Bury St. Edmunds, Burton-on-Trent, Cheadle Hulme, Chorlton-cum-Hardy, Gerrards Cross, Margate, Middleton, Shirley, Stafford, Stoke Bishop, Southend-on-Sea, South Shields, Staines, Widnes.

During the month the following additions to the main underground system were completed and brought into use :—

Bathford—Box,
Portcawl—Junction Portcawl,
Belfast—Ligoniel,
Manchester—Macclesfield,
Maidenhead—Henley,
Leeds—Bradford,

while 73 new overhead trunk circuits were completed, and 77 additional circuits were provided by means of spare wires in underground cables.

PUBLICITY.

EVERYWHERE one goes one can see the rapid strides which are being made by tradesmen generally to give better accommodation to display their goods in an attractive manner to passers by. New forms of window dressing are being adopted, made necessary by the larger window space that is being provided. Shops are lit up until late in the evening for the display of goods to be sold. Illuminated signs decorate all our large towns advertising somebody's wares, yet with it all we in the Telephone Service are still content to obtain our business by sending out Contract Officers. Why should not we have, in the larger towns anyway, window displays showing what wares we have to sell? Publicity pays not only in regard to the actual number of new orders obtained from it, but by obtaining the good will of existing subscribers and letting them know that they are not making the best use of the telephones they rent.

It is the writer's experience from doing his little bit to dress the windows of the Telephone Service, in addressing Chambers of Commerce, Chambers of Trade, Rotary Clubs, &c., that very few of our subscribers realise the many uses to which the telephone can be put, and the questions raised after such addresses demonstrate that the persons addressed make a potential body of advertisers of the Service.

I can fully recommend any District Manager to adopt similar methods of advertising.

The good fellowship engendered by such talks, the frank explanations which can be given to questions asked, the meeting with large numbers of subscribers throughout the district all help in letting the general public know that we are not dead but very much alive to the interest of the Telephone Service.

I find that, notwithstanding all the literature that is distributed, very few people realise what the possibilities of the Continental Telephone Service are, and how cheaply this service can be obtained. If the newspapers can be induced to report on such meetings so much the better.

B. WAITE.

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PERMALLOY: THE LATEST STEP IN THE EVOLUTION OF THE LOADING COIL.

[ABRIDGED FROM THE "BELL TELEPHONE QUARTERLY."]

FOR some time prior to the year 1900, it had been known to those skilled in the art of telephony that the transmission efficiency of long telephone circuits could be improved by increasing their electrical property known as the "uniformly distributed inductance." This knowledge did not, however, lead to practically beneficial results, because no one was able to suggest any feasible method of increasing this property of a telephone circuit without bringing in, at the same time, difficulties of one kind or another which were fatal. Numerous investigators sought unsuccessfully to simulate the beneficial effect of increasing the uniformly distributed inductance by introducing, into the circuit, inductance concentrated or lumped in the form of coils with cores of iron.

Professor M. I. Pupin, of Columbia University, in the City of New York, and Dr. G. A. Campbell, of the Staff of the American Telephone & Telegraph Company, independently and nearly together in point of time, proved that if inductance coils were spaced along the telephone circuit in accordance with certain rules, the lumped inductance so added would act very nearly the same as though it were spread out uniformly along the circuit. But, to attain this desirable result, it was imperative that the proper relation should exist between the number of lumped inductances (loading coils) in a given circuit and the length of the electrical waves. In other words, the proper spacing of the coils along the telephone circuit was the key to the solution and it was from failure to establish this fact that the earlier workers had failed. Priority in this mathematical-physical discovery was adjudged to Professor Pupin, and the American Company purchased his patent rights. But it was not then known how to make practical loading coils that the Associated Companies of the Bell System could employ successfully in improving the efficiency of their circuits. The problem of crystallizing the intellectual concept of loading into practical loading coils that could be used by the regular construction and maintenance forces in the operating field, was undertaken by a group of some of the most highly-trained experts of the American company's staff. A large amount of work was required to overcome electrical losses in the actual coils that otherwise would largely, if not wholly, have neutralised the expected benefits from loading. These electrical losses had to be overcome, a step at a time, by patient, exhaustive, scientific research. To make the invention practically useful it was necessary to develop coils of an efficiency much greater than any ever before made. To do this, dough-nut shaped cores were constructed, using iron of a special kind. This iron was drawn into a wire so fine that ten miles or more of it were needed to wind to a single core. And it became necessary to insulate all of this wire with a lacquer coating to prevent wasteful eddy-current losses. Fig. 2 shows the types of cores and completed coils that came into use in 1904. On each half of one of these doughnut-shaped iron wire cores there were wound many turns of insulated copper wire. One of these latter windings was connected into one wire of the telephone circuit and the winding on the other half of the core was connected into the other wire of the telephone circuit.

While many important advances were made in the period from 1904 to 1916, one of the most noteworthy steps in loading coil improvement was consummated in the latter year. It did away with the use of fine iron wire in the core, substituting for it a core built up of a pile of quoit-shaped rings of a new material, and fortunate it was that this development was completed at this time, for the dies, consisting of diamonds in which tiny holes were drilled, through which the fine iron wire had been drawn, were produced within the war zone in Europe, and as the supply of these essential tools for drawing the wire had been cut off by military operations, the further production of loading coils was threatened with serious interruption. Fig. 3 shows one of these cores built up of a series of rings.

These rings were made by compressing insulated fine grains of iron. To obtain iron having suitable properties, it was deposited electrolytically on cathode plates suspended in tanks. After being deposited on these plates, the pure iron was stripped off, broken up into pieces about an inch square and ground to a fine dust in a mill. The individual grains of iron were insulated with an oxide coating and shellac and then pressed into rings at a pressure of one hundred tons on each square inch of their surface. So fine were the particles of iron that a core of seven rings contained no less than thirty-five billion of them. This development was undertaken primarily to produce loading coils of greater magnetic stability and more uniform impedance than the wire core coils, and while it saved the day so far as the continuous supply of coils was concerned, it also resulted in better coils and enabled a considerable saving to be made in their cost.

By the year 1924, improvements having been made in the structure of fine wire cables which rendered them suitable for loading, a type of loading coil making use of a single thick ring (later two rings) for its core was developed principally for loading interoffice trunk circuits in fine wire cables. This led to substantial savings in plant costs, not only by extending the field of use of fine-wire cables, but also by further savings in the cost of the coils themselves. At the same time, the general intelligibility of talks over the loaded trunk circuits was appreciably improved, due to the fact that the new loading system permitted the transmission of a wider frequency band, thus reducing line distortion effects.

As a result of refinements in design and economies in manufacturing methods through the employment of higher speed processes, a further saving in certain types of loading coils was realised at the beginning of the year 1926. This development was accomplished without any sacrifice in efficiency and, as it permitted a substantial reduction in the size of the coils, it assisted in overcoming a difficulty which was beginning to cause some apprehension. Loading coils are hermetically sealed in large iron cases, in order to exclude the moisture which would be fatal to their operation. (Fig. 1, illustrating some of these cases of coils placed in an underground manhole and showing the "stub" or connecting cables, by means of which the connexions are established between the loading coils in the cases and the main cable which is to be loaded, is not reproduced here.) With the growth in the telephone

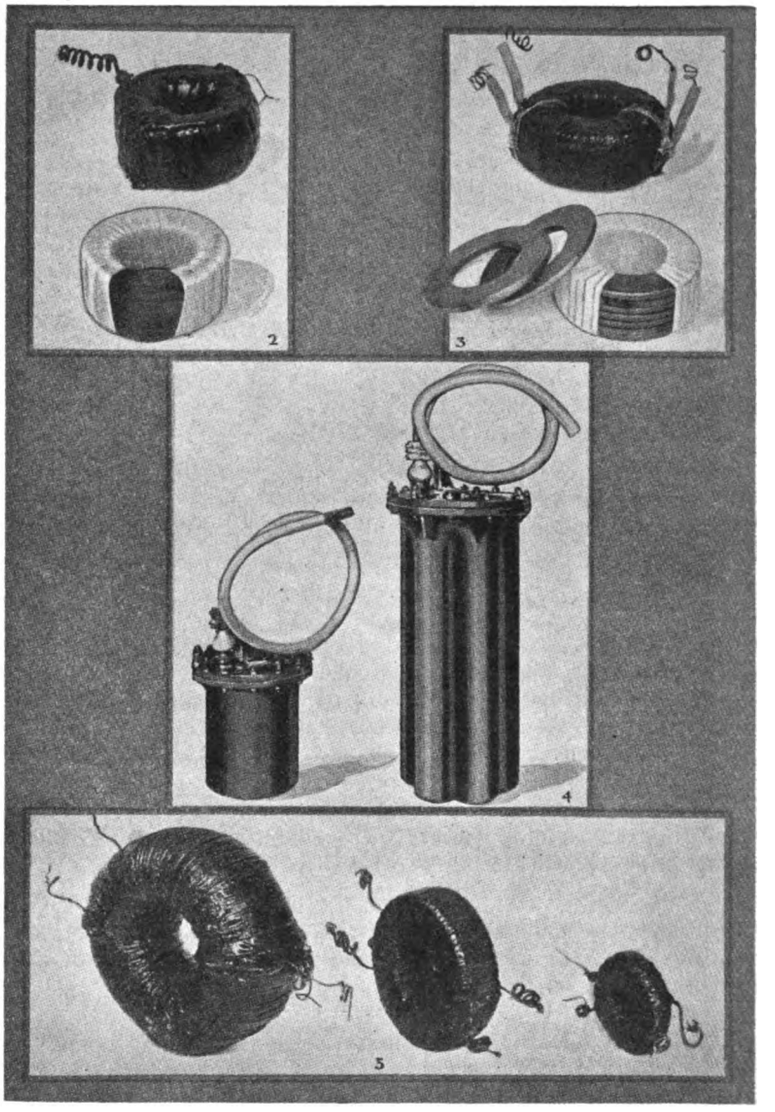

Fig. 2—Cable loading coil of type used in 1904; complete coil above; wire core below.
Fig. 3.—Cable loading coil first used in 1916. Complete coil above; iron dust core and two core rings below.
Fig. 4.—Comparison to show reduction in size of case for 200 coils due to use of permalloy core.
Fig. 5.—Left, coil with iron wire core. Centre, coil with iron dust core. Right, coil with permalloy core; diameter 2¼ in.

plant in the larger cities, it was becoming increasingly difficult to find space in the manholes for the cases of loading coils, so that this improvement, which, by decreasing the size of the coils, permitted more of them to be placed in each case, was especially welcome, particularly in congested metropolitan areas.

The next and latest step in the design and construction of loading coils has come about as the direct result of one of those fundamental scientific discoveries emanating from the Bell Telephone Laboratories to which reference was made in the early part of this article.

"Permalloy" is the name which has been given to a new material which has magnetic properties many times greater than those of the best irons and steels hitherto available. It is an alloy of about 80% of nickel and

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20% of iron, specially heat treated. Permalloy was discovered by G. W. Elmen, in the Bell Telephone Laboratories. One of its first important applications was to the continuous loading of transoceanic telegraph cables, where the high magnetic permeability which this substance affords was a prime requisite. By winding a wire or ribbon of permalloy spirally over the telegraph wire in the submarine cable, the speed of signalling has been increased so that the traffic-carrying capacity of a permalloy cable is many times greater than that of submarine telegraph cables constructed in accordance with the previously existing art. Although permalloy in the form used for telegraph cables was wholly unsuited for use in making the cores of loading coils, the intrinsically low hysteresis (that is, the lagging of magnetisation relative to the magnetising force) of this material encouraged the Staff of the Bell Telephone Laboratories to seek for some means of utilising it in loading coil construction. The technical skill of the metallurgical experts in the laboratories was focussed upon the problem of adapting permalloy so that its advantageous properties could be usefully employed in loading coils. The problem of developing the new alloy so that it would be suitable for use as a loading coil material, was a difficult one, but the solution was found after continuous experimental work extending over several years and calling for the co-ordinated efforts of groups of specialists in the fields of chemical, electrical and metallurgical science. Keeping pace with the developments in the laboratories, was the work of the manufacturing engineers of the Western Electric Company who were responsible for initiating plans for producing the new coils in large quantities as soon as the progress of the development work warranted this step. As the result of the fine co-operation of the Laboratories and the Western Electric organisations it has been possible to realise the advantages from this latest step in the evolution of the loading coil at the earliest possible date.

Fig. 5 shows, on the same scale, at the left a type of loading coil that represents the state of the art from 1904 to 1916; in the middle the type of iron-dust core coil that immediately preceded the permalloy coil; and at the right, the latest coil, having the powdered permalloy core, for use on inter-office trunk lines. The great reduction in size is apparent and the very substantial saving in cost can be appreciated when it is realised that loading coils are being manufactured and installed on local and inter-city cables in the plant of the Bell System at the rate of about 700,000 a year.

Fig. 4 shows, on the same scale, cases equipped with 200 loading coils; that on the right being a case containing 200 coils of the type immediately preceding the permalloy dust coil and that on the left containing 200 of the coils with permalloy cores. The saving in the space occupied in the underground manholes where the cases are customarily installed is extremely important, particularly in metropolitan areas. These new coils are coming into use on new construction, but they will not displace the older coils already installed or render them obsolete.

While the use of permalloy is the latest step in loading coil development, there is no reason to believe that it will be the last. It is, of course, impossible to state what the next step will be, but judging from past experience, one may look forward confidently to the time when further progress in fundamental research will bring about the production of still better coils. It is an outstanding characteristic of this loading coil development, in common with so many subjects to which the research specialists of the Bell System devote their efforts, that in reducing an original idea to practice, a vast amount or work must be done, extending into every detail and constantly pushing forward. At the present time, 27 years after the discovery of the loading coil principle, development work to improve the coils is going on as actively as at any time in the past.

The realisation that the threshold of technical development in the telephonic art was crossed within the memory of men now living, serves as an inspiration to the younger research workers in the Bell System. As they solve problem after problem they find, unfolding at their feet and challenging their best efforts, an ever-widening vista of new conquests waiting to be made. As in biology, the evolution of the telephone plant leads constantly from the simple to the complex. The Telephone Pioneers have blazed the trail; those who are following in their footsteps inherit the responsibility and the joy of extending and expanding it into myriads of avenues of commercial and social communication, ready at all times and adequate in every respect to serve the growing needs of the Nation.

FREDERICK L. RHODES.

PRESENTATION TO MR. S. F. McFADDEN, M.A.

A PLEASANT little ceremony took place at Nottingham on April 30, on the occasion of the retirement of Mr. S. F. McFadden, M.A., Traffic Superintendent, on reaching the age limit.

Mr. C. N. Carter, Traffic Superintendent, in a happy speech, referred to the esteem which Mr. McFadden had inspired during his stay in the North Midland District, and asked Mr. McFadden to accept from the Traffic Staff a wireless loudspeaker and a fruit stand, which represented sincere wishes for a happy time of retirement. Mr. McFadden, in reply, thanked his colleagues and referred to his association with both the National Telephone Company and the Post Office. Anything he had done at the rather difficult times preceding the transfer, and at any other time, to help the Staff he had been most glad to do.

Mr. McFadden will be greatly missed. With an extremely ready grasp of a subject he combined sympathy, helpfulness and patience and these qualities endeared him to all. He carries with him the hearty good wishes of the Staff.

BRIGHTON AUTOMATIC SYSTEM.

BY A. C. FRANCE.

THE opening of an Automatic Exchange has ceased to be a novelty; requests for a few notes respecting the Brighton Multi-Exchange area indicate, however, that such matters are still of interest. In response to those requests—if not too late—the following notes have been written.

The transfer to automatic was satisfactorily effected at midnight on Nov. 12 last. It is of interest to note that the actual "cut over" of some 7,350 lines occupied 7 minutes, which must be regarded as a very creditable performance.

A brief history of the development of telephones in the Brighton area may be of interest. The first exchange, which was situated in West Street, was opened in 1882 with ten subscribers. In 1891 this exchange was acquired by the late National Telephone Company, who, in 1896, transferred it to Ship Street in order to provide for development. A Magneto Multiple switchboard was installed. In 1903 the Brighton Corporation opened a competing exchange at Palace Place; its life as such was short and it was taken over by the Post Office in 1906. By this time exchanges were also operating at Hove, Preston, Kemp Town, Portslade, Southwick and Rottingdean, the magneto system or variations of it providing the needs of the area. The year 1905 saw the conversion of the Ship Street equipment to Common Battery working, Hove Exchange being similarly converted shortly afterwards. At the time of the transfer to the State in 1912 there were 4,578 working lines in the area.

Prior to the transfer to automatic the Brighton area was served by eight exchanges, at the transfer two of these (Post Brighton and Kemp Town) were abolished, leaving six. There was a considerable amount of regrouping of subscribers' lines; much of this was rendered necessary owing to the fact that the old Corporation exchange served the whole of the Brighton, Hove, Kemp Town and Preston districts during the period of competition.

The automatic system installed at Brighton is Siemens 16, and with the exception of the dial there are no novel features. The following equipment has been installed:—

Exchange.	*Pre-Selectors.*	*Final Selector Multiple.*	*Total Working Lines.*
Brighton ...	4,400	4,700	3,337
Hove	3,980	4,200	2,916
Preston ...	960	1,000	729
Portslade ...	380	400	274
Southwick ...	130	200	98
Rottingdean ...	130	200	98

From the accompanying illustration the novelty of the dial will be observed. The first digit of the numbering scheme is occupied by the name of the exchange, e.g., 2 = BR, 3 = HV, &c. It will thus be seen that in the case of a Brighton number being required instead of dialling, say, "21234" the subscriber is taught to dial "BR 1234"; or in the case of a Hove number, instead of, say, "31234," he dials "HV 1234."

One manual exchange, situated in Brighton, has been provided for the area, and the following positions have been equipped:—

1 key ended order wire carrying lines from London Toll Exchange.
1 service Private Branch Exchange.
2 jack-ended "B" positions for "dialling-in" to exchanges.
18 "A" positions for subscribers and coin box "O" levels.
6 Monitorial.

There are 27 exchanges which "dial-in" to Brighton.

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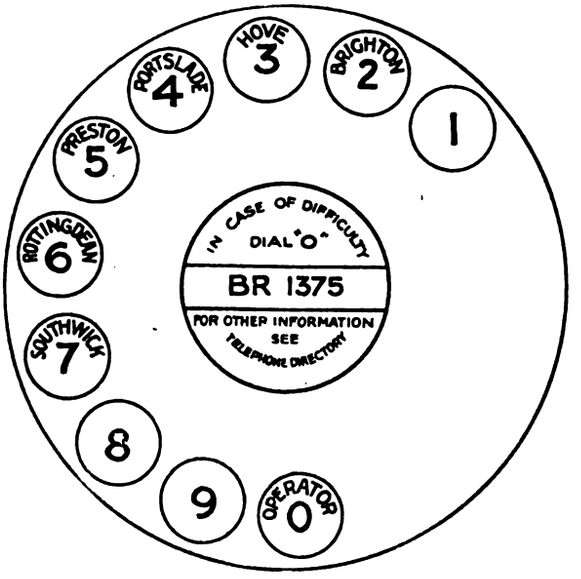
The official opening ceremony took place on Nov. 23. A large and representative gathering of prominent townspeople were present, including the mayors of Brighton and Hove, also Lady Rawson, the wife of one of the M.P.'s for the Borough.

Col. Kelly, Surveyor of the District, on behalf of the Postmaster-General extended a welcome to the company to the new exchange, where they had had an opportunity of seeing the new hand-maiden which had been provided for the benefit of Brighton. Col. Kelly added that Brighton had now a very good telephone service, and one that would compare favourably with any in the world.

Mr. Tansley, Head-Postmaster, Brighton, added his welcome on behalf of the members of the staff, and expressed appreciation for the sympathetic co-operation of the public, which had helped greatly in effecting the satisfactory transfer.

The Mayor of Brighton expressed, on behalf of himself and the Council, their pride in the new system and congratulated the staffs on the triumph achieved.

Mr. Tandy, Superintending Engineer of the District, said those who had seen the delicate equipment at the exchange would realise that where the human element was displaced extraordinary



complications were introduced. Mr. Tandy pointed out that the success of the new system would depend a great deal upon the user. Dr. Wright, Managing Director of Siemen Bros., acknowledged the splendid co-operation that had existed between the Post Office engineers and the contractors' engineers.

The Mayor of Hove referred to the grumbling which took place in the old days of the National Telephone Company, and which was continued when the system was taken over by the Post Office. He did not suppose grumbling would stop, even now, for it was an Englishman's privilege to grumble, and he would claim that privilege in any circumstances. He congratulated the Post Office on the provision of the new system.

Mr. McCormack, Executive Engineer, Brighton (South) said that the Staff were intensely pleased with the wave of appreciation shown by the Public. He paid tribute to the devotion of all who had been engaged in carrying out the successful transfer, the chief reason for that success being the close co-operation between Messrs. Siemens Bros'. Staff, the District Manager and his staff, and the Post Office Engineering staff.

Lady Rawson paid a warm tribute to the work of the Supervising and Operating staff.

Mr. Taylor, District Manager, pointed out that whereas under the manual system a subscriber was served by one operator, under the new system he had the choice of mechanical operators. Mr. Taylor added that there had been comparatively few faults, and he looked forward to the new system providing full satisfaction.

INFORMAL MEETINGS OF LONDON TRAFFIC OFFICERS.

WITH the advent of the automatic system and in view of the opening of automatic exchanges in the London telephone area, the Traffic Officers of the London Telephone Service inaugurated a series of informal meetings to discuss features of interest in automatic working.

The first of these meetings was held on Feb. 1, when Mr. W. F. Newland introduced the subject "Traffic Distribution." The discussion was very keen and the many points raised showed that Traffic Officers generally realised the importance of a close acquaintance with distribution of traffic throughout the automatic plant.

On March 7 Mr. C. W. Gerrard opened a discussion on "Coder Call Indicator Working." The difficulties experienced as a result of the opening of the Tandem and Holborn Exchanges were explained, together with the methods used to detect and obviate them. The ensuing discussion was illuminating and the opinions expressed were very varied.

At the third meeting, on April 4, Mr. R. J. Niles chose as his opening subject "Automatic Equipment Provision." The discussion dealt with the traffic aspect of exchange equipment provision and was of sustained interest throughout.

The last meeting of the Session was held on May 2, when Mr. F. W. B. Thwaites contributed a paper on the "Opening of New Automatic Exchanges." The subject was dealt with very thoroughly, and the discussion showed that the new aspects that were involved in the automatic system had received a considerable amount of thought from Traffic Officers generally, and that many theories were awaiting the result of practical experience.

The large attendances and the freedom of discussion at the meetings indicates the keen interest taken in them as well as the popularity of the subjects. Indeed, regrets were generally heard that time did not permit the subject to be dealt with more fully.

The meetings will be resumed during the coming autumn, when matters of at least equal or perhaps even greater interest will be discussed.

LIVERPOOL TELEPHONE SERVICE NOTES.

I THINK that local correspondents to the *Journal* will agree with me that the furnishing of notes of interest is a most difficult matter.

The recognition of promotions, marriages, retirements, socials, sports, &c., appears to form a sort of standby and occasionally something unusual happens in the district to provide us with a little copy, but immediately we pounce upon an item of real interest which looks like good material for half a column or more, we find that the subject has been dealt with in detail by one who has that detail at his finger-tips.

Readers will have realised by now that I have a bee in my bonnet. Well, I had quite a nice little paragraph ready for publication in this issue regarding certain winter activities which take place in the Liverpool district, but upon opening my June copy of the *Journal* I found the subject dealt with at length by the gentleman who initiated those activities. I refer to the article headed "Staff Meetings and their Bearing on the Service," by A. E. Coombs, Glasgow.

Further comment would be superfluous, and I can only add that the meetings here have lost none of their interest since the departure of Mr. Coombs from Liverpool.

In view of my very recent association with the telephone side of the house, and the fact that I have only subscribed to the *Journal* since that date, the above-mentioned coincidence has caused me to ponder, and ask myself the question: "Do any activities of the telephone interest take place in the Liverpool district which have not already been handled publicly by such able exponents as the present District Manager of Glasgow?"

Exhaustive enquiry into this question revealed the narrowness of my scope, and I would be glad to know from other local correspondents whether this condition of affairs exists throughout the country, and whether we can only hope to use the standby material.

I could, of course, ask our Editor to kindly send me a batch of back numbers, but somehow I don't think I will. However, having brought the Editor into the narrative, like Milton Hayes, I must find something for him to do, and, believing that I have actually stumbled across something interesting, telephonically interesting, of course, I have a faint hope that he will find space for its publication.

Naturally I have made careful enquiry in order to find out whether the subject has received publicity previously, and have been assured that such is not the case. I must ask the Editor to suppress any article other than mine that he may receive dealing with the Isle of Man T.T. Races. We look upon this as a peculiarly Liverpool matter.

Turning to the unofficial domestic side of our notes, the retirement of Miss S. Williams, Clerical Officer, Traffic, and Miss E. March, Typist, District Office, must be recorded. Both have left the Service to take up the more onerous duties associated with marriage, and we wish them every happiness. We quite enjoyed the informal receptions and admired the numerous gifts.

A real welcome is also offered to Mr. W. Moseley, Assistant Traffic Superintendent, who has returned to us from Leeds. C. H.

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GLASGOW TELEPHONE NOTES.

"Bonnie Charlie's Noo Awa."

HAVING witnessed the retiral of many old colleagues during post-war years his own farewell arrived on the expiry of his "notice to cease" on May 31. By continuing beyond the "last quarter date" his last month in the Service was a heavy one. We write concerning Mr. Charles Ferguson, the popular Class I Contract Officer.

Charlie was a favourite. Charlie always smiled. Charlie was a bachelor! At the presentation ceremony the District Manager (Mr. A. E. Coombs), who occupied the Chair, dispelled much of the sadness of the "parting" by his humorous remarks. His references to Mr. Ferguson as the "Kiosk King" were greatly enjoyed by all. Mr. Ferguson was chiefly responsible for the rapid development (when the City Fathers permitted) of the public kiosks throughout the district. Mr. D. Reid spoke on behalf of the younger C.O.'s, making special reference to the cordiality with which Mr. Ferguson welcomed the many new recruits who have entered the Service as Contract Officers during recent years, and Mr. R. G. Forsyth supported by referring to the help and encouragement all new entrants had received at the hands of Mr. Ferguson.

Mr. Ferguson's days in the old N.T.C. were recalled by Mr. Arch. Chambers. In those days the Metaphone provided an outlet for Mr. Ferguson's energies. Other speakers preceded the Contract Manager (Mr. F. Lucas), who made the presentation, and, incidentally, the speech of the evening. With witty words and happy humour, with simple sentiment and appropriate sincerity, Mr. Lucas handed to Mr. Ferguson a Gold Waltham Watch from the staff with these good wishes:—

On this your retiring year
We wish you happiness, good cheer;
In years to come we hope you may
All debts and bills be able to pay;
May your future paths be sweet as honey,
Peaceful, happy, placid, and sunny.

Through the liberality of the contributors a pretty hand-bag accompanied the presentation for Miss Ferguson.

Charlie replied, or, at least, he tried to. But the social favourite, the successful bowling skip, the "life of" the Whist Club, was so touched by the appreciative remarks of the officials and the affectionate references of the staff that he could say little. His usual confidence deserted him and he said little more than "Thanks." But we know it was his heart that spoke.

Mr. J. Martin, Contract Officer, Class I, transferred from Scotland Western District, succeeds Mr. Ferguson, retired.

To Mr. Martin we extend a hearty welcome.

Our congratulations to Misses A. Wilson and J. E. Banks on their promotion to the Allowance post at the Queen's Park Exchange.

The Glasgow Telephonists are specialists in more ways than the manipulation of telephone calls. At the Scottish Civil Service Sports Meeting on May 19 a team of 4 ladies from our Exchanges won, for the third year in succession, the 440 yards Inter-Departmental Relay Race. The names of the successful competitors are Misses J. Cusick, J. W. Cunningham, D. Elener and B. Patterson.

Our thanks and congratulations to our representatives, and none the less also to Miss L. Mortimer, the Officer in Charge of the Douglas Exchange, whose masseuse work had not a little to do with the matter.

Miss Margaret Bell, telephonist, Douglas Exchange, resigned the Service on May 19 in order to take up residence in the United States of America. Before leaving the staff presented Miss Bell with a handsome travelling rug and a leathern valise as a token of their esteem and good wishes. Miss Bell preferred to "slip away quietly," and at her request a staff Social which it was proposed to hold did not take place. Miss Bell was a most capable and conscientious officer and her departure is regretted by the whole staff.

J. L.

"THE ROAD TO THE—OFFICE."

Did you feel it to-day when you started out? The "thing" in the air—the freshness, the shimmer, the excitement of just being alive and in the sunshine. Did you revel in the greenery of the gardens as you passed, and as you walked on and came nearer town did you feel the "throb"—the bustle and stir of the trams and buses, the motor-cars and lorries, and the policemen with their clean white gloves directing the ever-increasing traffic? Did you feel the heat-haze as you hurried on? The very pavements answered with a "click" to your step. Everyone and everything were full of haste; and the anticipation of what the day would bring forth was high. You could work wonders this morning! The sun was out early and the *joie de vivre* was coursing through you. You wanted to laugh aloud with somebody. "What a day for a tramp in the country!" Did you think that? And then did you have to put the thought away and think it was better to work on a fine day than a dull one? And then were you glad you had a job and that you could walk to it? Oh! it's a great life, "The Road to the—Office."

M. L. TULLOCH.

ABERDEEN NOTES.

THE staff of the Aberdeen Telephone House, to the number of nearly 60, met in the Imperial Hotel, Aberdeen, on April 27, to take leave of Mr. Alfred C. Scott, who has been promoted from the office of overseer in the District Manager's office, Aberdeen, to that of a higher clerical officer in the District Manager's office, Edinburgh.

Mr. Archibald Clow occupied the chair, and referred to Mr. Scott's long services in Aberdeen and to the esteem in which he was held by all sections of the telephone staff.

Mr. P. Edmund, district manager, in name of the staff, presented Mr. Scott with a handsome oak clock with Westminster chimes, and in doing so paid tribute to the highly efficient manner in which Mr. Scott had discharged the whole of his official duties.

On May 30, 1928, on the eve of his departure for Glasgow, Mr. D. J. Melville, of the Contract Department, Telephone House, Aberdeen, was met by his colleagues and presented with a dessert service, silver-mounted casserole and fountain pen as a mark of esteem and appreciation.

Mr. Melville, who has been nine years at Telephone House, has left to take up the duties of Development Officer in the Contract Department of Scotland (West) Telephone District, Glasgow.

KEW AGAIN!

ONCE more the mixed battalion of C.T.O. retired officers of all ranks, and both sexes—on the 13th of last month, to wit—met by the West Side of the Palm House, Kew Gardens, where the proposal that "a short ramble in gardens . . . shall take place," was more popularly rejected than accepted, until some of the keepers of the Royal demesne began to look rather suspiciously upon the gathering crowd. However, nothing happened except a partial block of the gravelled pathway, and a few resentful looks from one or two passers-by, as who would say, "Have you bought the place with your penny?"

Hunger, and the clever shepherding of the ubiquitous Charlie Keen and his second in command, 'Arry Adams, soon led the crowd into the Imperial Restaurant, where a really liberal table and good service was provided.

The open air is not a good place for all but the most "leather-lunged" of speakers, and few could be heard beyond the immediate vicinity of their "soap box," except C. S. K. and friend Bailey. Everyone, however, did their best to make up for the lack of good accoustic properties of a huge riverside garden, but there was much regret at the continued absence from these gatherings of the ex-Controller, Mr. John Lee, whose doctor still vetoes his attendance at meetings of this and a similar nature. The Belgian traveller could not get to the festal board, but another of the clan was back in something like his old form. The presence of Miss M. A. Watts was the pleasant surprise of the party, and she has probably made a record for an ex-C.T.O.-ite of the weaker (?) sex at 86 years. A list of those present follows:—

Mrs. J. Abrahams, Mr. W. W. Abrey, Mr. and Mrs. H. E. Adams, Mr. and Mrs. T. J. Allison, Mrs. W. H. Ampleford, Mr. and Mrs. S. R. Ashby, Mr. J. Bailey, I.S.O., Miss H. E. Bartlett, Mrs. H. E. Bath, Mr. and Mrs. F. J. Bathe, Mr. and Mrs. A. Bathurst, Mr. O. Bathurst, Mr. W. A. Batten, Mrs. L. Beadle, Mr. A. F. Bell, Mr. H. E. P. Bell, Mr. G. T. Bennett, Mr. G. E. Birch, Mr. E. Bird, Mrs. M. Boddington, Miss A. E. Booth, Mr. C. J. Boulton, Miss S. E. Briault, Mr. and Mrs. F. W. Butler, Miss M. Camp, Mr. and Mrs. T. W. Charter, Miss E. J. Clarke, Mr. H. Clarke, Miss E. Coldwell, Miss P. L. Cooper, Mr and Mrs. H. J. Dicks, Mr. and Mrs. R. Donaldson, Mr. E. Donne, Mr. C. Elphick, Mr. H. W. Evans, Mr. E. Fulcher, Mr. F. J. Furby, Mr. and Mrs. R. A. Furness, Mr. J. N. Geary, Mr. A. Gordon, Miss M. Grealy, Miss A. Grimmette, Mr. T. W. Gunter, Miss A. Hale, Mr. F. W. Harrison, Mr. E. L. Hilton, Miss M. E. Hitchings, Mr. R. Hewle, Miss A. M. Hutt, Miss E. M. Ireson, Mr. A. T. Jacobs, Mr. A. E. Johnson, Mr. D. W. Jones, Mr. J. J. Jones, Mr. W. E. Jones, Mr. and Mrs. C. S. Keen, Mr. R. E. Kemp, Mr. A. E. Kings, Miss A. A. Kitts, Mr. G. F. A. Lange, Mrs. A. J. Lawrie, Mrs. H. J. Lawrence, Miss A. E. Lee, Miss F. A. Le Pla, Mr. C. R. Lowe, Mr. A. W. F. Ludlow, Mrs. A. C. McEwan, Mrs. J. J. Mansell, Miss E. C. Mayersbach, Misses B. and E. Miles, Mr. F. W. Miles, Mr. C. J. Miners, Miss E. Moore, Mr. F. J. Muller, Mr. R. H. Mulock, Messrs. H. and S. F. Pace, Miss B. St. C. Page, Mr. S. Pearce, Mr. W. Plumer, Mr. H. Pond, Mr. and Mrs. B. W. and Miss Powell, Miss H. A. Read, Mr. T. Sadler, Mrs. A. Samuels, Mr. and Mrs. H. W. Senhenn, Miss E. J. Sleeman, Mr. and Mrs. S. J. Smith, Miss L. Strachan, Mr. and Mrs. E. Tibbles, Mr. W. J. Town, Mr. and Mrs. S. J. Treby, Mr. H. Trollope, Mrs. A. Turner, Mr. C. J. Turner, Mr. W. Turner, Mr. and Mrs. W. J. Twyman, Mr. J. J. Tyrrell, Miss F. Underwood, Mr. E. Walton, Mr. E. A. Ward, Miss F. J. Watts, Miss M. A. Watts, Mr. A. E. Wheeler, Mr. F. White, Mr. F. J. White, Mrs. F. W. G. White, Miss J. Wiltshire, and Mr. and Mrs. H. B. Winder.

J. J. T.

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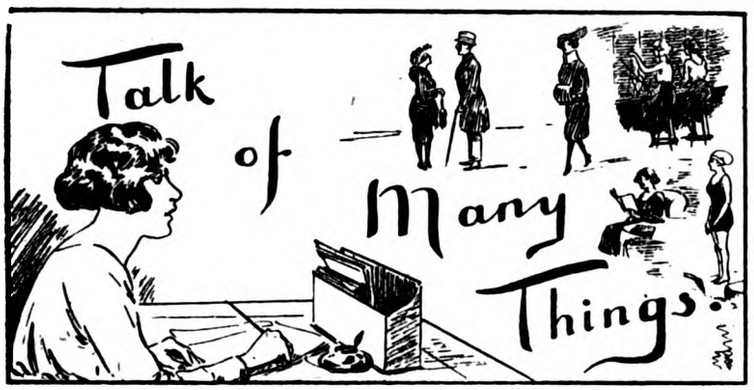
WE TELEPHONISTS.



"Hey, ho, the Wind and the Rain."

JUST now it's raining. It seems as though it has been raining for ever and that it will continue to rain for ever. I cannot see a break in the clouds because there is no break to see. There is no horizon because a mist is enveloping the world. The tops of the hills are shrouded and I doubt whether the tops of the mountains are high enough to pierce the soft coverlet of cloud. Columns of fleecy whiteness rise ever and anon from the trees in the valley. Last night I slept in a hut on the hillside and I listened to the steady patter of rain on the roof. It soothed me and brought a feeling of contentment and peace. I wanted to keep awake to hear it but its insistent monotone gradually lulled me to sleep. Sometimes the wind urged it to a higher note and hurried its pace or said to it with a wicked grin, "Go on, he's in there, soak him. What a joke!" But the rain wouldn't or couldn't—anyhow, it didn't. It sounded so gentle that possibly it wouldn't. I don't think that it was really bothering about me just then. It had previously met me in a wild shelterless region and had there thoroughly introduced itself and had kept company with me for many a mile. Nearby a rivulet gurgled appreciatively and trickled musically and in the distance a waterfall roared like a giant whose strength was renewed, sounding like thunder reverberating among the hills. I fancied I could see the trees swaying gently and laughing as the water danced through their foliage. I knew that on the morrow the sweet air would be sweeter, the green grass greener and that the way would be softer to the tread. The wild flowers would be lifting their faces daintily to be kissed by the sun and wind and the moss would turn to velvet. The rivers would brawl boastfully and would glisten the dry rocks, and the song of the birds would have added music. The stern frown of the mountains would soften and the weeping valleys would smile again. Thus I thought ere I drifted into sleep—but how different my thoughts would have been if the roof of that hut had leaked last night.

PERCY FLAGE.

A Reply to Mr. Flage.

Dear Editress,—A little help is worth a deal of pity—that Mr. Flage you allow to occupy so much of *our* column says he feels sorry for Nelson because the latter is so much out of the public mind. Why doesn't he, then, help to bring Nelson to mind—he could do this by giving everyone he met two half-nelsons; they would almost certainly pay attention, and give proof that they were so doing. He could wash away the results to his eye in one of the fountains under Nelson's eye and thus feel absolutely at one with Nelson.

The reason I have intervened is that I happen to be the model who sat for the girl at the desk. Mr. Flage is wrong in all his suppositions except when he refers to your beauty and mine. Mr. Flage has obviously never been to school, but has he never heard of the Operators' School at Clerkenwell? It was, of course, there that this studio study of me was made—a fact which explains the desk and the coiffure, because new entrants only learn the latest devices in the art of the hair dresser towards the end of their school course, and it is some time later before they learn the precise length of material which traffic tradition has standardised as appropriate for the dress of a first year's telephonist. The reason I have that "far-away" look in my eyes is not what Mr. Flage thinks at all, but because I am filling in a form for a second time and it is difficult to remember just what I said previously.

The smaller figures represent the images conjured up by my thoughts——so Mr. Flage is wrong again. The gentleman is a headquarters' official speaking to a supervisor who has unwisely made some slighting remark about automatics and he is telling her (look at the tilt of his nose), "Automatics have come to *stop*; and she is saying, "Oh yes—stop what?" The heavily clothed figure walking by herself is not, as you might suppose, dressed simply to cope with an ordinary June day, but as she lived near the exchange has hurriedly slipped home and put on two of everything in order to meet the needs of the swimmer who has been so intent on winning the Founder's Cup that she has found herself at the office without changing, having, thanks to our modern fashions, passed quite unnoticed through the streets. The girl who is reading is not in an exchange at all, she is my mother (doesn't she look young—it runs in our family—father's the same). That armchair was bought in one of fifty ways and was delivered in a plain van—you won't find an armchair like that in any exchange, not even in the night staff room.

Well, good-bye dear, I'm sorry to have taken up so much of your time and space, but I really could not allow Mr. Flage to go unanswered when he was so perceptibly and flagrantly wrong.

YOUR DEVOTED MODEL.

The Daily Joy Ride.

From the moment one leaves the precincts of home the fun begins! An hour ago we were peacefully sleeping; now—what a contrast!

To start with, the road is in chaos, half of it being roped off, while dozens of industrious workmen make as much noise as possible; buses there are, but you are lucky if you attract the attention of the driver, and the trams, well, the *trams*, 'nuf said.' Still, the train must be caught, and with our thoughts centred on this one fact we valiantly endeavour to board one or other of these vehicles. If we happen to be a little bit late, how it crawls, the only thing which acts as a spur being if a tram and bus are running a race with the two drivers intent on getting there first, though where the winning post is nobody apparently knows—however, they do move when the spirit of rivalry catches them.

Now for the train. Gentlemen first; if there are any seats to spare the girls can have them. Another stage over.

Now for the buses once more. Here they are all lined up, waiting. How considerate; but wait a moment, first one, "192," that won't do; second one, "349." Who wants a "349"? and so on, until we come to a likely number; apparently everyone else wants the same, and the people who have any corns on their feet had better look out. Here is where that little motto comes in that we all know so well, "If at first you don't succeed, try again." Patience, here comes another one. No luck; five more precious minutes wasted; we begin to see our names under the red line—this won't do. Cheers, here come two more vehicles both going in the right direction, and a minute later we have gained the coveted seat. A quarter of an hour later we enter the office. What a game!

L. R.

An After-thought.

Lest any of my friends should fear,
I've neither part nor lot in 'em,
Perhaps I ought to make it clear—
Anent my ode to Tottenham;

That whilst my visit I enjoyed,
I've no real wish to rusticate—
I find my time quite well employed
Where Hebrew Subs. do congregate.

Though round our premises do cleave,
Both warehouse and distillery,
I simply could not bear to leave
My dear old friend, Ann Cillary!

Of loyal workers we've no lack
And I have not forgotten 'em;
Although I pat upon the back
Our little sister, Tottenham.

The well-known proverb re self-praise
Restrains my pen from comment vain—
But gladly do I spend my days
With all my friends at Creechurch Lane!

C. A. S.

Competition.

Competitors are reminded that the closing date for sending in sketches for the column heading is July 9 next. Envelopes should be marked "Designs" and addressed as below:—

THE EDITRESS, "Talk of Many Things," *Telegraph and Telephone Journal*, Secretary's Office, G.P.O. (North), E.C.1.

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THE TELEPHONE IN THE WEST OF SCOTLAND.

MANY interesting things about the telephone service in the West of Scotland were related at a recent meeting of the Rotary Club of Kilmarnock by Mr. J. K. Murray, the District Manager of the Scotland Western District—a district which includes the area (excluding Glasgow) between Fort Augustus and Gretna.

It is essential, he said, that the Telephone Authority should provide equality of treatment to its subscribers and a speedy service of high quality. The desire is to progress and improve wherever possible, and no stone is left unturned in this direction. Telephone transactions now run into millions daily, and in such circumstances every second counts. The service is seldom without its critics, and each item brought to notice is carefully investigated, and if the fault is ours we try to find a cure.

We are sometimes accused of being very smart in pressing for payment of our accounts. When it is realised that a capital outlay representing many years' subscriptions is spent before the telephone service can be given to new subscribers it will be agreed that it is only reasonable that an immediate return on this capital should be forthcoming as soon as it is available for service. It should be specially borne in mind (1) that the service is installed free of all charge, and (2) that no charge is made for renewal of the plant from time to time, and (3) that reconstruction expenses consequent upon storm damage are borne by the Post Office without extra levy upon the subscriber whose plant is involved. Like the postal and telegraph service, the telephone service is essentially a pre-payable one, and the present rates have been fixed on the basis that accounts will be paid when rendered. The total number of items detailed on the actual accounts each quarter (in this district) is 884,490. The total number of originated calls made during 1927 was 15½ millions; roughly 12 million local calls and 3½ million trunk calls, an increase of 700,000 local calls and 160,000 trunk calls over the previous financial year. The total revenue collected for the district was £307,857, an increase of nearly £16,000. The operator at the Exchange is the servant most directly in touch with telephone users, and her attitude towards the public may make or mar its good name. The operators are trained how to speak to the subscribers and to effect their requirements with accuracy and dispatch, and perhaps I might take the liberty of hinting that occasional lapses from ideal standards of patience, courtesy and accuracy are not confined to the exchange end of the wire. The results of the test calls made by subscribers in the presence of the Service Inspectors in the course of their visits to offices, &c., for this district are as follows: Average speed of answer, 6.9 seconds; percentage of subscribers satisfied, 99.4. The written complaints totalled 585 for the district in the last year, or one for every 26,552 originated calls. The telephone instrument on the table represents to the subscriber the complete telephone equipment, although under the heading of plant must not be forgotten the intricate mechanism and miles of wire installed and available for connexion to that instrument, which is merely the last link in the chain, and which, contrary to popular belief, is less subjected to strain than portions of the plant not so readily visible to the public but equally essential. When anything goes wrong with this delicate electrical network there is a tendency to blame the operator at the exchange who is nearest to hand, without due regard to all the factors of the case. After giving some figures of the development of the district, Mr. Murray referred to various facilities available to telephone subscribers, which were not taken advantage of as they should be. On learning of these for the first time many people were surprised and even chagrined to find that such services were in existence and that they had not known of them before. Yet particulars regarding them were contained in the preface to the Telephone Directory, the study of which subscribers would find profitable to them. Thus it was possible for a telephone subscriber to 'phone a letter to an exchange and have that letter delivered by express messenger to any address—not necessarily that of a telephone subscriber, of course. A charge of 3*d*. was made for transmitting a letter of 30 words, and 1*d*. for every additional ten words, in addition to the 6*d*. for express delivery. Again, telegrams could be telephoned, and a subscriber could at any time get Greenwich Mean Time by ringing up the exchange, and it could be arranged that the exchange should ring up a subscriber—and ring violently, if necessary—at any hour of the morning, thus functioning as a particularly efficient alarum clock. Household users, continued Mr. Murray, are advised not to relegate the telephone to a position in a cold hall or a cloakroom, but rather to select a table instrument and have it in a suitable position in their most frequently-used sitting-room. The bell can be placed separately from the instrument at a central point within range of maid or mistress. In this way anyone sitting beside the instrument is not startled when the bell rings. Conversation is maintained in comfort, and if additional privacy is required for a special message plugs and sockets can be provided at one or more points at the cost of a few extra shillings. The instrument can then be carried through to another room—perhaps a bedroom—where it is also useful in cases of indisposition. In the domestic sphere a telephone can prove an economy, saving fatigue in visits to shops, and in making appointments. Disappointments at social gatherings can similarly be eliminated. Friction is avoided in hundreds of the emergencies which occur in every household, however well regulated. The business man can intimate his being detained to be late for a meal. He can take a longer luncheon interval in the confidence that by telephone he can be got for anything urgent. Indigestion is thereby avoided and long life secured. Surely all this is not dear at 2*s*. 6*d*. a week!

PRESENTATION TO MR. ROWLAND HILL.

AT the District Manager's Office, Scotland West, Glasgow, on April 3, 1928, an interesting function took place in the Contract Department Room, when Mr. Rowland Hill, Traffic Superintendent, Cl. I, was welcomed by a representative gathering of the staff and made the recipient of a handsome gold watch and casserole pyrex dish in silver stand, on the occasion of his retirement from the Service.

In making the presentation Mr. J. K. Murray, the District Manager, referred to Mr. Hill's sterling qualities, also detailing the various positions held by Mr. Hill since he entered the Service. Words of appreciation were added by Mr. Marshall, the Chief Clerk, Mr. Brodie, Contract Manager, Mr. Finlay, Traffic Superintendent, Cl. II, Mr. Buchanan, Assistant Traffic Superintendent, and by Mr. Dalziel, as representing the members of the staff associated with Mr. Hill since his coming to the Scotland West District in 1913.

Mr. Hill, in accepting the gifts, spoke feelingly of the reception given to him and offered his warm thanks for the good wishes expressed.

CORRESPONDENCE.

ADVERTISING THE TELEPHONE SERVICE.

TO THE EDITOR OF THE "TELEGRAPH AND TELEPHONE JOURNAL."

Sir,—Referring to Mr. Hood's letter in the May number of the *Journal*, it is agreed, of course, that the Telephone Service should be adequately advertised, but one hopes that desiccators and jointers' tents will not be used for the purpose. Trouble has already been caused by such methods and the practice was abandoned. When streets are disturbed by the Department and the public inconvenienced, the less the matter is advertised the better. Shopkeepers and others will grumble, but as often as not do not trouble to find out the party responsible for having the road up.

With regard to publicity generally, the Post Office possess excellent sites but, in my opinion, make inadequate use of them to advertise the various services provided.

The following are a few instances of inadequate publicity:—

1. A new building that is an architectural improvement to the town displays a cinema advertisement at the front entrance, but there is little to indicate that it is a Telephone Exchange and Post Office, except a few more or less insignificant notices in the windows and a stamp-vending machine hidden away in a by-street.
2. Almost all the larger Post Offices and many of the smaller ones display advertisements for other people's commodities. Many of these advertisements do not harmonise with the design and furnishings and often spoil what might otherwise be an imposing office.
3. Public kiosks and call offices are frequently difficult to find owing to the inadequacy of the notices.
4. Why should not the front door panel of the kiosk be used to advertise the telephone, making the notice fit in with the design of the kiosk?

Probably my critics will tell me that it is quite unnecessary to label a post office—everyone knows where it is and if they don't they can ask, and as regards advertising other people's wares, the Post Office draw a good income from this source. Again, am I not aware that canvassers are continually pushing the telephone? and so on. My reply is to look around and see what other concerns are doing, e.g., the railways, particularly the Underground Railways of London. This Company selects the best sites for its own advertisements, designs them artistically and as regards directing the public to the stations and booking offices leave little to be desired.

If, however, the Department does not set about utilising the sites at its disposal one does hope that the advertising matter will be presented to the public in a striking and artistic manner. A great public Department should set an example of high-class publicity: to adopt the methods of the roadside garage would be unpardonable.

The advertisements might give the public brief information on the following services, viz.:—

Telephones (including transoceanic telephony).
Telegraphs (including transoceanic telegraphy).
Savings banks.
C.O.D. system.
Express letters, night telegraph letters, &c.

Finally, the publicity should obviously be in the hands of an expert and the advertisements in certain cases should be varied at intervals. It will be of little use to print a lot of dull notices and send them out with instructions that they should be displayed in accordance with circular XYZ and leave it at that.

J. M. SHACKLETON.

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LONDON TELEPHONE SERVICE NOTES.

Contract Branch.

THE results obtained by the Contract Branch during the month of May were a net gain of 4,461 stations as compared with a net gain of 4,093 stations for the corresponding month of last year.

* * * *

During the week-end of June 9/11 the Headquarters of the Contract Branch moved from 32 St. Bride Street, which had been their home for about eight years, to Cornwall House, Waterloo Road, which has been for some time the home of the Headquarters of the London Telephone Service and the Accounts Branch.

This move may be described as a return to the "fold" after eight troubled years spent in the "desert," but the removal was not hailed with the appropriate joy or enthusiasm by the staff who had become attached to the St. Bride Street premises and its position in the City. The new quarters are a distinct improvement on the old, but the fact that the branch only occupies an infinitesimal fraction of a floor gives it the impression that it has moved into a wilderness where it is surrounded by the philistines of other Government Departments.

Although human nature is intensely conservative and hates change, it is also very quick to adapt itself to new surroundings, and in a very short time the Branch will appreciate its new home and its neighbours, and would view any suggested change with as much or more misgiving than the removal to Cornwall House.

* * * *

At a recent meeting of the London County Council, one of the members suggested that telephones should be provided at all elementary schools in order to reduce the danger of delay in case of fire or accident and also to increase the efficiency of the service and bring it into line with modern practices.

On receiving an unfavourable answer the originator of the suggestion retorted with the following question: "May I ask whether the Chairman is aware that London is the only great City in Europe with the exception of Stamboul where the schools are not connected with the telephone system.

The Chairman contented himself by saying that he must have notice of the question but, as telephone people, we hope that he will reconsider his attitude to the suggestion.

* * * *

Sports Notes.

A team selected from the L.T.S. played the Brighton Engineering District at Brighton the first of two matches arranged this season.

A party of about 40, under the guidance of Mr. Adams, travelled by train and, favoured by fine weather, thoroughly enjoyed the outing. After the match the party were entertained to tea by the Brighton staff and later several of the party who still regard Automatics as something new and novel were conducted over the telephone exchange.

The mention of Automatics evidently stampeded many of the Traffic and Contract visitors, and with a cry of anguish accompanied by many strange and peculiar noises, interspersed with words which sounded like Holborn and Bishopsgate, they disappeared towards the sea, where many of them were found later taking advantage of the cooling waters so abundantly provided at Brighton.

Scores:—

Brighton	L.T.S.
111	63 for 8.

For the L.T.S. Adams knocked up a quick 24 and Shepherd the captain played very steadily for 17 not out. Smith also contributed a useful 13. Cowdray and Shepherd took the majority of the wickets.

The outstanding man for Brighton was Wood who scored 45 before being run out.

The return match should take place on July 14 and it is hoped to obtain a ground within easy reach of the city. Teas and refreshments will be provided if possible on the ground, and it is hoped that a good number of the L.T.S. staff will support the game. A further announcement will be made later.

The Contracts section team are making satisfactory progress in the Shield competition games and defeated a representative Accounts Branch team at Chiswick on June 5 by 101 runs to 80 runs.

Hodgkiss 20, Pearkes 29, and Wilson and Griffiths 13 each were the leading scorers for Contracts, and Pearkes bowled well throughout the innings, taking 3 wickets for 34 runs. Dickinson who was brought on late in the game took the last 3 wickets for 5 runs.

Bowls.—Two victories have been registered in the Bunbury Cup Competition. On May 31 the A.G.D. were beaten 77 shots to 60, and on June 20 the P.O. Engineers were beaten 59 shots to 53. The latest victory is particularly meritorious as the P.O. Engineers are the cup-holders.

It will be remembered that last year also, in their first season, the L.T.S. bowlers beat the holders.

Lawn Tennis.—A start has been made in the competition for the "Agnes Cox" Cup between teams representing various Sections of the Controller's Office and Exchanges.

The following first round results are to hand:—

Clerkenwell (holders) beat Hop.
Avenue beat Park.
A.R. 4 beat A.R. 1.
Wimbledon beat Operating School.
A.N. beat Ealing.
Willesden beat Kensington.
A.R.2. beat Ravensbourne.
Central beat Holborn.
Victoria beat Croydon.
Chiswick beat Putney.

* * * *

Retirement.

A respected colleague in the person of Mr. H. Scott of the Controller's Office retired recently. He had been in the service of the Post Office since 1904 and was regarded with esteem and respect by all those who came into contact with him. His retiring disposition eminently fitted him for staff work with which he was associated during the greater part of his official career. We wish him the best of health and good fortune in his retirement.

Mr. Scott was presented with a cheque by his colleagues as a token of the regard in which he was held.

* * * *

Night Staff Musicians.

The Night Staff have formed an Orchestra and Concert Party under the title of "Night Optimists." A successful first performance was given on May 15 at the Surrey Masonic Hall.

* * * *

Promotions to Assistant Supervisors, Class II:—

Miss E. M. AYRES, of Ealing Exchange.
Miss E .M. COOPER, of London Wall Exchange.
Miss R. WELLBY, of City Exchange.
Miss B. M. SAUNBY, of Hampstead Exchange.
Miss E. G. CURTIS, of City Exchange.
Miss W. F. AUSTING, of Clissold Exchange.
Miss E. T. AMOS, of Mayfair Exchange.
Miss C. A. GIBBS, of Rodney Exchange.
Miss H. E. DUNT, of Chancery Exchange.
Miss A. M. STORRAR, of North Exchange.
Miss M. ELIZABETH GARDNER, of Gerrard Exchange.

PRESENTATION TO MR. J. F. MURRAY (TRAFFIC SUPERINTENDENT, LEEDS).

ON May 5, 1928, at the Headquarters Telegraph and Telephone Traffic Section, Mr. J. F. Murray was presented, by his colleagues in the Section, with a wireless set, on the occasion of his promotion to the position of Traffic Superintendent, Class I, at Leeds.

When making the presentation, the Chief Inspector (Mr. J. F. Edmonds) recalled the fact that Mr. Murray had completed a quarter of a century in various branches of telephone service and referred to his direct association with important committees at Headquarters. In wishing Mr. Murray good luck and happiness in his new sphere, Mr. Edmonds remarked that among Mr. Murray's many characteristics his extreme stability and good judgment had gained for him the high esteem in which he was held by his colleagues at Headquarters.

The Deputy Chief Inspector (Mr. H. F. Deane) also gave testimony regarding Mr. Murray and his good qualities. Mr. A. Wakely paid his tribute to the good wishes for a departing colleague and took the opportunity of thanking Mr. Murray for the silver cup he had so kindly presented for annual competition amongst the golfing aspirants in the Traffic Section.

In a happy speech, which included some reminiscences, Mr. Murray referred to the enjoyable period of eight years which he had spent in the Headquarters Traffic Section and expressed his keen appreciation of such a handsome and useful gift, together with the good wishes which accompanied it.

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SOME AMATEUR THEATRICALS.

DURING a recent visit to the West Country I had the pleasure of travelling on a local railway in a carriage with two prosperous business men returning home from B——, one of whom was slightly deaf and the other was hotly enthusiastic over his local dramatic society. It was impossible to avoid hearing all the conversation. Indeed, one cynical might have thought that much of it was intended to impress the stranger with the importance of his fellow passengers, as it dealt in figures with business and Stock Exchange deals and the cost of their present and proposed residences.

But the patron of the Thespian art could not remain long divorced from his hobby. He began to describe the various activities of his Society, its triumphs and its trials, and repeated time after time that many of their supporters attended the same piece at several successive performances. Perhaps the following description of the caste of one piece may account for the second visits! Who knows!

He waxed very wroth with the criticism of a visitor from London, who on one occasion declared that the caste was all wrong. "What did that critic know about amateur dramatic productions anyhow? It was not a professional show for which you could choose your artists from throughout the length and breadth of the country. A dramatic society had to make the best of the material which it had to hand, and to fit in those members who had a right to a part. [Oh! how true!] The caste in that particular case was, undoubtedly, a good one," he asserted, "though, of course, it had a few drawbacks. We chose Phyllis —— for the heroine. She was supposed to be about eighteen and slim, but as you know, Phyllis will not see thirty again, and she is certainly not thin. She has, however, a very nice voice though it is contralto and the part was written for a soprano, but what did that matter! The hero's part was that of a naval officer of imposing appearance and considerable strength. We caste —— for that part as he had a beautiful baritone voice, but, unfortunately, he is slight and rather frail. In one part he was supposed to swing the heroine off her feet, but we cut that out after a rehearsal at which there was nearly an accident.

"For another leading lady we chose Flora —— who is a splendid actress and, if you grant that she cannot sing a bit, well, you have said all there is to say against her."

And so on and so forth until the train drew up at their seaside station and I was left alone to wonder at the folly of two old gentlemen who babbled about their friends in loud voices, not even suppressing their surnames. Had I been a friend of Phyllis and Flora, the fur might have flown in real earnest and one more dramatic society have come to an untimely end.

But ye gods and little fishes, what a performance! No wonder the audience returned again and again to witness the Russian dances of the fat contralto and the thin baritone.

J.W.W.

RETIRED POSTAL WORKERS' ASSOCIATION.

PROVISIONAL COMMITTEE ELECTED.

THE meeting at Essex Hall on May 24 of all grades of retired pensioned Post Office officials to consider the possibility of organising a Retired Postal Workers' Association for social and recreation purposes was a success. In the unavoidable absence of Mr. J. W. Bowen, who was attending an important conference at Berlin, Mr. H. E. R. Alefounder, editor of *Supervising*, was unanimously voted to the chair. Mr. Middleton read letters of regret at inability to attend from Sir Robert Bruce, Sir Charles Sanderson, Messrs. C. G. Ammon, M.P., and W. B. Cheesman. Bath and Bristol Retired Colleagues' Association sent fraternal greetings. Mr. Middleton said that the object of the meeting was to see if arrangements could be made for retired colleagues to keep in touch with each other. Difficulty, doubtless, would be experienced in tracing those who had retired, as they were so scattered, but he hoped that by means of the Service journals their existence as a society would be made known. In London the postal superintending officers had a flourishing society, also the C.C. and T.'s and the C.T.O., and there was also the L.P.S. Retired Colleagues' Association, composed in the main of all grades from F.S. There were societies at Bath and Bristol, but so far no real effort appeared to have been made to organise the rank and file in general. One or two principles needed to be stressed.

After leaving office there should be no class distinction. A real All-Grades Association should be set up, as each grade in its way had served the State equally well. Careful thought should be given to the aims and objects. There should be social intercourse, and it should also be educational, and economics might be studied. In the evening of one's life there are splendid opportunities for improving one's knowledge and outlook, as well as to recapture some of the spirit of the old comradeship. Sometimes in retirement there is a loneliness, and there is an aching for old companionship. They wanted to add a little to the fullness of life by helping to provide the means for cementing old friendships and to make happier times for those now living in retirement.

Mr. Alefounder paid a glowing tribute to the existing London veterans' societies. Some his most valued friendships, he said, were formed in the Post Office. It was an excellent idea to form an All-Grade Society. It ought to be welcomed with open arms.

Mr. John Bailey (late W.D.O.) brought forward a personal grievance, which he thought the new Association might consider. He warmly supported the suggestion for an All-Grade Society, and would help in every way.

Mr. H. Walter (late N.D.O.) said that no one appreciated more than he the organisation of retired postmen. He thought the U.P.W. could protect the interests of retired men. To organise means money, and those retired were on half pay.

Mr. H. E. Gardiner (late I.S.), in an interesting speech, spoke of his many activities, and gave a retrospect of his past Post Office life. He warmly approved the proposed organisation.

Mr. A. J. Mosedale, in a sympathetic speech, wished the new society all possible success.

Mr. A. Seaton said that at first we must not be too ambitious, but should concentrate on a simple beginning. In time and as the organisation developed we should be better able to examine and estimate cost, but there would be no lack of sympathy on behalf of the U.P.W. At all times a retired colleague could always receive advice and guidance from the Union.

Messrs. A. R. Wilkin and A. E. Mowling also addressed the meeting.

A motion that a provisional committee be elected to hammer out a scheme was carried unanimously. The following were elected: Messrs. A. E. Mowling, R. Seaton, H. Walter, J. J. Fillmore, J. Bailey, and A. R. Wilkin. This committee would meet a week hence, and report progress at another all-grades meeting.

A hearty vote of thanks to Messrs. Alefounder and Middleton closed the meeting.

This is a promising beginning. It was obvious from the demeanour of those present that a Retired Colleagues' Society is badly needed, and would be well supported. Pensioners present came from Chatham, Gravesend, St. Neots, &c. There was a good sprinkling of retired supervisors, testifying to their deep sympathy in the proposed Association.

SHEFFIELD TELEPHONE DISTRICT.

A REPRESENTATIVE gathering assembled in the Contract Manager's room on June 1, to present Mr. G. H. Hamer, Contract Officer, Cl. I, with a handsome travelling bag, tray and pipe on the occasion of his transfer to the Western District, for family reasons, at his own request.

Mr. Edgar, Contract Manager, presided, and spoke in high terms of Mr. Hamer's qualities.

Mr. Hann, Chief Clerk, Mr. Wilson, Contract Officer, Cl. II and Mr. Ede, Engineering Dept., also paid tribute to Mr. Hamer, and at Mr. Edgar's request Mr. Ferguson, Traffic Supt., made the presentation.

Mr. H. W. Mitchell, Assistant Traffic Superintendent, has been appointed Superintendent of Posts and Telegraphs, Malay States. He left the District on the 6th inst., carrying with him the good wishes of the whole of the staff for Mrs. Mitchell (formerly a Sheffield telephonist) and himself.

Prior to his departure, the District Manager, on behalf of all sections of the Commercial and Engineering Staffs, presented him with a Gold Wrist Watch as a token of appreciation and goodwill. Mr. Mitchell was the guest of honour at a dinner and dance held on June 5.

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A BRIEF CHRONOLOGY FOR STUDENTS OF TELEGRAPHS, TELEPHONES AND POSTS.

BY HARRY G. SELLARS.

(*Continued from page* 216.)

1853, Aug. ... Switzerland and Baden reached agreement on telegraph rates.

1853 ... ... Telegraphic Congress at which delegates from France, Belgium, Austria, Prussia, and minor German States were present. Sept.

Dr. Gintl, of Vienna, succeeded in obtaining duplex telegraph transmission.

Edward .Orange Wildman Whitehouse, of Brighton, patented a recording telegraph system, with keyboards of five keys, using five-line wires. He used Bacon's five-unit code for signalling, with a method of locking the keys to ensure contact.

Moses G. Farmer, of U.S.A., patented a system of multiplex telegraph working and adapted rotary distributors to House's printers.

1853, Oct. ... Digney invented a single-key telegraph tape perforator.

1853 ... ... Fuller suggested the use of a solution of zinc sulphate for batteries if required for immediate use. He also invented the mercury-bichromate battery.

First effective cable laid to Ireland between Donaghadee and Portpatrick. Retardation and induction observed in underground circuits.

Cables laid across the rivers Ohio, Merrimac, Mississippi and St. Lawrence.

First cable to Belgium laid between Dumpton Gap and Middelkerke.

At a telegraph conference in Turin the views of the Austro-German Union were adopted.

1,000 miles of telegraph line in Canada.

Over 11 millions of telegrams transmitted in U.S.A.

Subsidies to steamship companies for carrying mails reached £853,140. Committee appointed to inquire into the working of Packet Services.

Commission appointed to revise Post Office salaries (Lord Elcho, Sir Stafford Northcote, Sir Charles Trevelyan, and Mr. Hoffay).

Decided that a post less frequent than once a day could be increased in frequency if the estimated revenue (calculating letters at ½*d.* each) covered the cost.

1854 ... ... 41,392 miles of telegraph wire in use in U.S.A. Systems worked—Morse, House, and Bain. March.

1854 ... ... Principle adopted that all Post Office revenue should be paid into the Exchequer and all expenditure met by votes in Parliament. April 1.

It was proposed to connect Orfordness (Suffolk) with the Hague by seven separate cables, each with one core, and to twist them together near the shore. Three were laid and twisted about 3½ miles from the shore.

Lt. O. H. Berryman, on the *U.S.S. Arctic*, took soundings in the Atlantic with Lt. J. M. Brooke's apparatus. Lt. M. F. Maury, Chief of the U.S. Observatory, spoke favourably of the projected cable.

Admiral Fitzroy planned meteorological report system, and reports, in code, were telegraphed to newly formed Meteorological Office.

Frischen, of Berlin, obtained duplex telegraph transmission.

Charles Bourseul, of France, published a treatise on the electric transmission of speech and described experiments he had made. Speaking prophetically of the electrical transmission of sounds, he said, "What is spoken in Vienna may be heard in Paris. Imagine that one speaks near a mobile plate flexible enough not to lose any of the vibrations produced by the voice; that this plate establishes and interrupts successively the communication with a battery. You may be able to have at a distance another plate, which would execute at the same time the same vibrations."

J. B. Lindsay patented his method of conveying messages without the use of wires.

Siemens improved the perforator used by Bain and introduced an automatic transmitter.

Varley invented a double current telegraph key and a relay.

Whitehouse improved his recording telegraph apparatus and used only one wire.

Bombay-Calcutta telegraph line—1,500 miles—in operation. (The longest span of overhead wire used for telegraphic purposes is nearly 1¼ miles in length and spans the river Kistnah (India) at a height of 1,200 feet.)

1854 ... ... Georg Simon Ohm died. July 7.

Digney invented a double-key telegraph tape perforator.

Feddersen, Vernon Boys, and others, photographed the oscillatory discharge of a Leyden jar.

Thomas John, of Austria, devised a Morse inkwriter in which the signals were recorded on paper tape by a small metallic disc revolving in ink.

Lord Kelvin examined the effect of the electrostatic capacity and the ohmic resistance of telegraph circuits on the transmission of signals. He solved the mathematical problem of the propagation of currents in telegraph cables and devised a method of measuring the internal resistance of a battery.

(Edlund thought that elongation could be observed in strained wires when a current was passed through them.

Augustus Matthiessen, after experimenting, drew up a list of conductors of electricity in the order of their conducting powers.

Fizeau, Gonelle, Mitchell (U.S.A.) and Walker (U.S.A.) investigated the speed of electric currents.

Single needle telegraph replaced to a great extent by Bright's "Bell" telegraph, which produced two sharp different sounds representing dots and dashes.

1854, Aug. ... Bright, testing his "Bell" apparatus between London and Liverpool with messages containing plain language, cipher, names of foreign towns, &c., recorded greatest speed 37⅛ words a minute, average 27½ words a minute.

Foudrinier, Secretary of the Electric Telegraph Company, made tests of speed of double needle telegraph apparatus and recorded greatest speed 24½ words a minute, average 21¼ words a minute. Bain's printing telegraph recorded an average of 19½ words a minute.

Chartered Submarine Telegraph Company, which worked the Dover Ostend Cable, combined with the Submarine Telegraph Company, which worked the Dover-Calais cable.

European and American Electric Telegraph Company extended their lines from London to Birmingham, Wolverhampton, Stafford, Macclesfield, Manchester, and Liverpool.

40,000 miles of telegraph wire in United Kingdom—Electric Telegraph Company, 24,000 miles; English and Irish Magnetic Company, 13,000 miles; other companies, 3,000 miles. Electric Telegraph Company handled 520,890 telegrams.

1854, Sept. 4 ... Cable laid between Holyhead and Balscadden Bay, Ireland.

First Portpatrick-Donaghdee cable recovered.

1854, Oct. 14 ... Soren Hjorth patented an electrical machine.

Cables laid from Jersey to France, England to Ireland, Spezia to Corsica.

Cable laid across River Hudson.

1854, Nov. ... France and Spain reached agreement on telegraph rates.

Double needle working between England and France.

Telegraphic Company of New York, Newfoundland and London obtained the sole right of carrying cables to Newfoundland for fifty years.

6,000 miles of telegraph lines in France connecting 105 stations.

Practice of perforating sheets of postage stamps introduced.

1855, Jan. 1 ... First Irish Travelling Post Office established between Dublin and Cork.

Bright's "Bell" telegraph apparatus adopted by the Magnetic Company.

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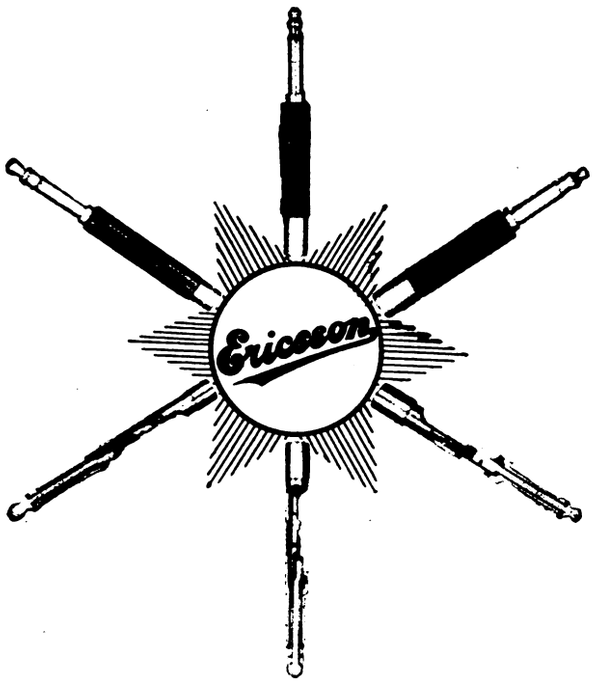

BETTER PLUGS

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THIS ENSURES:—

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Ericsson Ericsson Ericsson Ericsson Ericsson

1855, Feb. 23 ... Johann Karl Friedrich Gauss, of Brunswick, died.

David, E. Hughes produced a direct working printing telegraph apparatus on which the signals were sent by means of 28 keys arranged like those of a piano and letters, or figures, were printed by a typewheel on paper tape.

(Froment modified and improved the construction of Hughes' printing telegraph apparatus.

Exchange Telegraph Company of London uses typeprinter for dissemination of news, with a keyboard similar to that of the Hughes.)

1855, March ... First street letter box erected at corner of Fleet Street and Farringdon Street, London.

Journal entitled *Les Annales Télégraphiques* founded by a committee of French telegraphists.

Duboscq constructed a clockwork regulator to adjust the carbons of electric arc lamps automatically.

1855, May ... William Thomson showed that the apparent velocity of an electrical signal depends upon the resistance and capacity of the circuit.

Jacob Brett made an unsuccessful attempt to connect Sardinia with Algeria by cable.

J. P. Humaston, of U.S.A., patented a keyboard tape perforator, punching Morse characters, in which the operator used foot pedals to provide the necessary power.

1855, June 1 ... Ten francs for 25 words charged in England for telegrams between England and France. France added 2 francs for the message plus 12 centimes for every 10 kilometres traversed by the telegram.

Electric Telegraph Company purchased all patents of Cooke and Wheatstone and some of Bain's.

British Association doubted possibility of establishing cable across the Atlantic.

1855, Sept. ... Bright patented a method of duplex telegraph working which was adopted by the Magnetic Telegraph Company.

Cable laid between Cape Breton and Newfoundland.

Stark, of Vienna, and Bosscha, of Leyden, invented diplex telegraph transmission and suggested quadruplex telegraph working.

1855, Oct. ... Representatives of Belgium, France and Prussia met in Berlin and agreed upon 41 Articles covering various phases of international telegraphy.

Telegraph system composed of engraved dials and movable pointers installed in St. George's Hospital, London.

1855, Dec. 29 ... Belgium, France, Spain, Sardinia and Switzerland, in Paris, agreed that the Spanish and Italian languages should be added to the three (French, German and English) authorised in the agreement of October, 1855, and that Spain could exercise choice as regards acceptance of German. The agreement also dealt with rates and urgent, ordinary and government telegrams.

882,360 telegrams dealt with in the United Kingdom.

Admiralty entered into a contract for the conveyance of mails between England and Australia, via Suez. Limited time for conveyance 54 days—Southampton to Melbourne.

Stamp duty on newspapers abolished.

456,000,000 letters delivered by Post Office.

Rates for "Book Post" reduced to 1*d.* for 4 oz. up to 1 lb.

Indian Mail sent from Alexandria to the Nile by rail.

1856, April ... Digney devised a three-key telegraph tape perforator.

Ernst Siemens invented an iron tubular telegraph post.

Smee devised a battery of platinised silver and zinc. He prevented the deposition of hydrogen on the negative plate of a battery by mechanical means.

1856, Oct. 9 ... Bright and Whitehouse showed Morse, who was visiting London, that 270 signals a minute could be transmitted over a circuit of 2,000 miles made up of underground wires joined in series.

1856, Oct. 20 ... Atlantic Telegraph Company registered. Bright advised the Company to construct the Atlantic Cable with a seven-wire strand. This was adopted in the Newfoundland-Cape Breton cable.

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1856 ... ... Whitehouse, experimenting in connexion with the rate of signalling over submarine cables, discovered that the speed could be increased by sending currents in opposite directions, alternately.

On Magnetic Company's underground lines the gutta-percha insulation began to decay and an overhead system was considered. This led to the absorption of the British Telegraph Company, which had already combined with the European and American Telegraph Company. The amalgamation was entitled the "British and Irish Magnetic Telegraph Company," and the new organisation entered into a working arrangement with the Submarine Telegraph Company which handled the traffic for the Continent.

Ernst Siemens produced a magneto-electric machine in which coils of wire were wound lengthwise on a spindle which rotated between the poles of several steel magnets.

Pension of £4,700 per annum granted in 1686 to Duchess of Cleveland, and her successors, out of Post Office revenue, commuted for £91,000.

London divided into postal districts. Postal Guide appeared for the first time.

Holland and Portugal signed the telegraph agreement of December, 1855.

Ernst Siemens invented a system of telegraph signalling in which the length of a dot or dash is determined by the intervals between the holes on perforated tape.

1857, Feb. 22 ... Heinrich Rudolf Hertz born, in Hamburg.

1857, April ... Bright patented a cable dynamometer.

1857, May ... Bright and Charles de Bergue patented some improvements in the machine used for paying out cable.

Cable with four conductors laid between Sardinia and Bona.

William Thomson invented his mirror galvanometer.

D'Arsonval, Melloni and Wiedemann also devised galvanometers.

Gaugain introduced a galvanometer consisting of two parallel rings with a magnetic needle placed midway between them.)

1857, Aug. 5 ... Shore end of Atlantic cable fixed at Valentia.

1857, Aug. 6 ... Shore end of Atlantic cable laid from Valentia, Ireland. H.M.S. *Agamemnon* and U.S.S. *Niagara* standing by with Atlantic cable on board.

1857, Aug. 7 ... Shore end of Atlantic cable joined to portion on board U.S.S. *Niagara* and paying out commenced.

1857, Aug. 11 ... Atlantic cable broke in 2,000 fathoms of water after 334 nautical miles had been laid. *Agamemnon* and *Niagara* returned to Plymouth and the cable was stored in dry tanks, defective portions being replaced by new ones.

1857, Sept. ... Austro-Germanic Union, meeting at Stuttgart, agreed to come to an understanding with l'Union des Pays Occidentaux.

1858, Jan. 1 ... Metropolitan Postal Districts established.

Registration of letters to and from the Colonies came into force at a fee of 6*d*. Various fees were charged on letters to foreign countries.

Longridge and Brooks, in a paper to the Institution of Civil Engineers, recommended the lightest possible form of cable for deep sea conditions.

Latimer Clark devised a conductor built up of segmental copper wire. Wilkes suggested an outer tube.

Latimer Clark, Frederick Braithwaite and William Preece patented a covering for cables.

Company formed to lay cables between Suez, Aden and Karachi.

First cable to Holland laid between Lowestoft and Zandvoort.

1858, June 26 ... H.M.S. *Agamemnon* and U.S.S. *Niagara* commenced laying Atlantic cable but the cable broke and both vessels returned to Queenstown.

1858, June 30 ... Two Telegraph Unions met in Brussels.

Jacob Brett failed to lay a cable between Candia and Alexandria.

1858, July ... H.M.S. *Agamemnon* proceeding towards Valentia, and the U.S.S. *Niagara* towards Newfoundland, commenced laying the Atlantic cable from mid-ocean.

1858, Aug. 1 ... Telegraph Conference at Berne "to simplify the telegraph service and to introduce uniformity of principles between the various administrations. Countries supporting the findings of this Conference were Belgium, France, Holland, Portugal, Sardinia, Switzerland and Spain."

1858, Aug. 5 ... H.M.S. *Agamemnon* and U.S.S. *Niagara* succeeded in laying Atlantic Cable.

1858, Aug. 5 ... Communication established by means of Atlantic Cable, which had broken several times during the laying, 640 miles being lost.

William Thomson's mirror galvanometer used on Atlantic cable.

1858, Aug. 16 ... Queen Victoria and President Buchanan, of the United States, exchanged complimentary messages over Atlantic Cable.

Culley stated that when a current was sent by cable from Ireland to Newfoundland no effect was observed at the receiving end until two-tenths of a second had elapsed.

1858, Sept. 1 ... Communication with America by the Atlantic cable ceased.

A ten-cell Smee battery was not considered sufficient to work the Atlantic Cable so a large Transformer, weighing about a ton, was constructed so that a voltage of about 2,000 was available. While the cable lasted, 366 messages, containing 3,842 words, were exchanged.

Edward Bright patented a curb telegraph key expressly designed for working the Atlantic Cable. The key was taken to Valentia but arrived after the cable had broken.

1858, Oct. ... Another Telegraph Conference held at Friedrichshafen.

Rouvier proposed fixing at each end of a circuit two pendulums provided with contact brushes which would brush over segments arranged in an arc and so transmit the letter signals. Siemens and Halske pursued this idea and produced the "Pendel" telegraph system.

C. F. Varley introduced telegraph repeaters at Amsterdam to transform the English double current system into the Continental single current system, devised the "loop" test for locating faults on telegraph lines, constructed the "reel" lightning protector for telegraph circuits and used condensers in cable working to overcome earth currents.

Michael Idvorsky Pupin born, in Hungary.

Sir Charles Wheatstone and John Matthias Augustus Stroh patented an automatic telegraph system.

Wheatstone patented a perforator for preparing telegraph transmission tape, using Steinhil's alphabet.

J. H. Johnson patented a dynamo-electric machine.

Muirhead introduced the "Chamber" form of Daniell cells which could be more easily handled than the troughs then in use.

United Kingdom Telegraph Company formed and used Allan's needle apparatus on overhead lines. This Company originated the system of universal shilling messages—20 words with addresses free.

Indian Mail sent from Alexandria to Suez by rail.

Delivery of letters at every house contemplated and system tried in districts round a few towns.

Colonial Money Orders suggested by Canadian Government.

1859, Feb. 1 ... "Limited Mail" trains introduced for the Scotch Night Mail Service—number of passengers and parcels limited.

Clausius, supporting the hypothesis of Grotthuss, postulated the idea that under the influence of an electromotive force the direction of constituent atoms of liquid is controlled.

Marqfoy and Garnier introduced an automatic telegraph tape perforator.

1859, May 28 ... Cable between Suez and Aden completed.

1859, June 1 ... Money Order system with Canada commenced, with limit of £5 and commission at four times the inland rate. Malta and Gibraltar issued orders payable in Canada.

(*To be continued.*)

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THE

Telegraph and Telephone Journal.

VOL. XIV. AUGUST, 1928. No. 161.

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TELEGRAPH AND TELEPHONE MEN AND WOMEN.

LV.

MR. A. J. WALDEGRAVE, M.B.E.

MR. A. J. WALDEGRAVE, who became Deputy Accountant General last April, entered the Civil Service in November 1891, and has spent the whole of his service in the Accountant General's Department of the Post Office.

Judging from his name, Mr. Waldegrave's ancestors must have come over with the Conqueror, and such an ancestry would account for his possession of a keen wit and a logical penetration of mind, but there must also be a strong Saxon strain in him, for he has solid qualities of a kind which are not usually associated with the Gallic character.

Mr. Waldegrave is a mine of information on all matters affecting Post Office financial practices and policy, and he is a refuge to distressed officers of other departments who get involved in these difficult matters. His blood is on his own head, however, if he finds these enquirers troublesome, for he invariably receives them so nicely that they return to him in further times of distress as to a Father Confessor.

He has been abroad on several occasions on international missions, and he was decorated for valuable services during the War. He has always been deeply interested in social problems, and his knowledge of the literature dealing with such subjects is both extensive and profound.

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THE POSSIBILITIES OF A TRANS-CONTINENTAL LONG-DISTANCE TELEPHONE SERVICE BETWEEN EUROPE AND ASIA.

ABOUT a year ago Oberpostdirektor LITZINGER of Berlin published an interesting article on this subject in the Journal *Europäischer Fernsprechdienst*, of which an abridged translation is subjoined. Towards the end of his paper Herr Litzinger says that the radio engineer will have a word to say on the matter, and we confess that there seems to be every probability that wireless telephone service with the East and India is likely to be established before the stupendous task of providing physical communication between this country and India could be accomplished. There is, however, no reason why the next few years should not see telephone lines connecting Western Europe with Constantinople and even Angora.

Europe possesses a reliable telephone cable system (of which 7,400 km. with 720,000 km. of double wire are in Germany alone). For international telephone service a fixed basis has been established both in technical and administrative respects, upon which several countries have worked with success. Even in 1922 an expansion of the European telephone system could be spoken of which a decade earlier would have appeared fantastic. And now, six years later, it can be said that not only are the cable systems of the chief telephone-using European States to be found in full development but the interconnexion of these networks for a European trunk service has become a fact. The question of inter-European telephone service is thus solved.

How will development proceed further, according to the general laws of traffic ? Just as in the case of other kinds of traffic, whether by telegraph, by railway, by ship or by aircraft, first the networks of the periphery of the existing network will be united to the latter, and then, to extend their effective range of communication, will seek connexion with other interstate networks. On all sides countries hitherto little developed are bestirring themselves. They surpass the decade-long periods of development of States with dense networks and avail themselves of the newest devices.

Critical periods arise in stages of regular development, during which further progress stands still either for a short or long time. Sometimes this dead period is turned to favourable account by men of action. A great impetus was given to all kinds of communications by the war, otherwise so hostile to progress, e.g., uneconomic railways were built for strategic purposes. The railway built across the Suez Canal from Cairo to El Kantara and Palestine achieved a connexion with the Hedjaz Railway and forms an uninterrupted line of rail via Aleppo, Mosul and Baghdad to the Persian Gulf by using the Baghdad-Basra line, also completed during the war.

Moreover, the Syrian junction point, Aleppo, affords connexions with the Anatolian Railway line to Smyrna, Angora and Constantinople. Further plans for the extension of the railway from Baghdad to Teheran and thence to Peshawar and British India are only projected. . . . The necessities of communication gave a like impulse to telephone connexions. One of the longest trunk lines must have been that from Germany to Constantinople. Thus the experiences gained in telephony in war became useful to mankind in peace.

The technique of trunk line traffic is sufficiently far advanced that constructional difficulties do not appear invincible in comparison with those of long-distance railways, and measures for organisation of the European long-distance telephone traffic possess already a reliable foundation. Let us consider the question of a transcontinental trunk in the case of a given example, e.g., that between England and India.

We in Germany are in the happy position of being not only the pathfinders, but we also actually completed the work. It was Werner Siemens who, in 1869, created a complete Indo-European overhead telegraph which bridged with certainty a distance of 10,000 km. and still to-day fulfils the purpose for which its master created it. . . .

The Indo-European telegraph line is principally for traffic between British India and the Motherland, but the properties of a transcontinental telephone line would require that it also served internal and interstate traffic of the countries it crossed. If we consider the course of the Indo-European line, which runs from London via Emden, Berlin, Thorn, Warsaw, Rovno, Zhitomir, Odessa, Kertch, Tiflis, Julfa, Teheran, Ispahan to Bushir, thence to Jask, Gwadir and Karachi, using the cable of the British Indian telegraph system, we shall see that there are long sections on which the joint use of this line as a transcontinental telephone line for the traffic of intermediate States cannot be made forthwith. One must therefore look for other routes which run more favourably for telephone service.

* * * *

What route suggests itself for an Indian line, leaving out of account the Siemens line referred to ? From England to Budapest, in the nature of things, only the existing trunk cable system comes into consideration. Budapest can, therefore, be considered as the point of departure for the new route. The continuation of the trunk cable from Buda Pest to Belgrade is already being earnestly considered. There are considerable advantages in following the railway, which affords facilities for transport of workmen and material, is traversible in winter, and the route can be placed under the supervision of railway staff. The telephone line will thus follow in general the Orient Railway via Belgrade, Sofia, Philippopolis, Adrianople and Constantinople. The connexion of the more important Balkan lines with the route as contributory channels can be considered later.

The construction of a transcontinental telephone line through the rugged defiles of the Balkans will require great technical skill . . . The transit of the Bosphorus is another hindrance to the extension of the line. The terminus of the Orient line is at the Sirkeji Station, about 500 metres from Galata Bridge, in which direction a cable could be laid. The bridge is 468 metres long, but is useless for carrying the cable, as it is partly a swing bridge. The water about the bridge is 40 metres deep, under which lies a stratum of 20 metres of mud. The landing of the cable at the north side of the Golden Horn at Galata would present no difficulties, nor would the extension of a land cable through the European quarter of Pera. Some of the Turkish cables cross the same part of the Golden Horn. The Turkish lines run in a northerly direction to Rumeli Hissat, a mightly castle of old Turkish times on the Bosphorus. This is here at its narrowest (660 m.); and this is where Darius on his Scythian march, threw a bridge over the Bosphorus. Although the Turkish cable is laid at this point to the Asiatic coast at Anadolu Hissar, its depth of about 120 m., with a tearing current, is unsuitable for a telephone cable. The Sheitan Akintisi (Satan's Stream), as this part of the Bosphorus is called, on account of its strong current, must be avoided even at the cost of greater length of cable. The simplest way would therefore be to cross the southern outlet of the Bosphorus immediately near the terminus of the Orient Railway, about the Serai Point, in the direction of the starting point of the Anatolian Railway, Haidar Pasha. The Bosphorus has here a breadth of about 3 km. and a depth of 50-70 metres. The current is not so strong as further north. This route has the advantage of greater shortness, since it avoids a circuitous way round Scutari. The economic importance of further development of the telephone for Constantinople can be considered later.

It would be well to land the Bosphorus cable in the neighbourhood of the modern Haidar Pasha station, from which it would immediately continue its further route on Asiatic soil. The railway, a single line of normal gauge, is of great importance for the

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development of the trade and agriculture of this region. After a journey of 157 km. Geve is reached, a place of some interest, as, south of the station the old caravan route for Persia via Angora (over which the telegraph line from Constantinople to Diabekir, Bagdad, Fao, and Bushire is carried) branches off. The railway now climbs the Anatolian plateau, and reaches a height of 810 metres above the sea level at Eskishehir. Here a line branches off to Angora, from which a continuation to Sivas is being constructed. In May last a railway line 400 km. long from Angora to Kaissarieh (the ancient Caesarea) was opened.

The Anatolian railway continues southwards to Alayund, Afiun Karahissar and Konieh, where it terminates and the Baghdad railway begins. This also is a single line of normal gauge. It crosses the Cilician Taurus, reaching 1,467 metres at its highest point, boring the range with numerous tunnels and crossing the wilderness by means of bold viaducts. In its conquest of the Taurus, the Baghdad railway is one of the most magnificent mountain railways of the world. A transcontinental telephone line would strike some historic memorials in these regions, where the traveller may recall with reverence events associated with the names of Xerxes, Darius, Cyrus, Alexander the Great, Harun al Rashid and Godfrey of Bouillon. Proceeding from Adana, the railway overcomes the Amanus range by means of further numerous tunnels and viaducts, and crosses to Islahia plain to Aleppo.

Aleppo is the junction for the Anatolian, Hedjaz, Syrian, and Baghdad lines. It would play an important rôle in the telephone system.

The Baghdad line proceeds via Jerablus, Ras-al-Ain, Tell Helif, and Nisibin to Mosul (near Ancient Nineveh). At Jerablus it reaches the Euphrates, which it crosses by a bridge 800 miles long, and along its route the telegraph wires are carried on iron poles. From Mosul to Baghdad it follows the right bank of the river.

The railway continues from Baghdad to Basra (570 km. distant) and about 100 km. from the Persian Gulf. Here the railway system ends and up to this point affords an assured route and a regular plan for a transcontinental trunk line about 4,574 km. long (2,840 miles). About 100 km. of land line would have to be constructed to Fao on the Persian Gulf.

The concluding section up to its route over the Inland land lines from Karachi must be laid as a sea cable in the Persian Gulf, about 50 metres deep, via Menama, Shuam, and Jask. For the remaining section from Jask to Karachi along the Gulf of Oman there is the possibility of either a land line or coast cable. The connecting link between Fao and Jask, of about 1,480 km., consist of single lengths of 620 + 520 + 340 km. altogether, the laying of which in favourable depths is not difficult.

The question whether this line is to be constructed as a land-cable, aerial cable or open wire requires special investigation and has not been gone into.

The various separate distances of the route already considered are set out in the following tables :—

TABLE I.

		Kilometres.
	A.—EUROPE.	
(*a*)	Existing cable route— London, Frankfurt, Vienna, Budapest	1,956
(*b*)	Beyond cable system— Budapest—Belgrade—Sofia—Constantinople	1,491
(*c*)	Bosphorus cable— Constantinople—Haidar Pasha	5
	B.—ASIA.	
(*a*)	Anatolia Railway— Haidar Pasha—Konieh	747
(*b*)	Baghdad Railway— Konich—Aleppo—Mosul—Baghdad	1,766
(*c*)	Baghdad—Shatt-al-Arab— Baghdad—Basra	570
(*d*)	Basra—Persian Gulf— Basra—Fao	100
(*e*)	Sea-cable Fao—Jask	1,480
(*f*)	Landline—Jask—Karachi	1,100
(*g*)	Land line British Indies (Railway)— Karachi—Delhi—Cawnpore—Benares—Calcutta	2,695

TABLE II.

		Existing Cable. Km.	*New Sea Cable. Km.*	*Lines on Railways. Km.*	*Lines on Roads. Km.*
Aa	London—Budapest	1956*	—	—	—
Ab	Budapest—Constantinople ...	—	—	1,491	—
Ac	Constantinople—Haidar Pasha	—	5	—	—
Ba	Haidar Pasha—Konieh ...	—	—	747	—
Bb	Konieh—Baghdad	—	—	1,766	90
Bc	Baghdad—Basra	—	—	570	—
Bd	Basra—Fao	—	—	—	100
Be	Fao—Jask	—	1,480	—	—
Bf	Jask—Karachi	—	—	—	1,100
Bg	Karachi—Calcutta	—	—	2,695	—
	Total ...	1,956	1,485	7,269	1,290

Grand Total 12,000 km. (7,450 miles).

* It may be observed that the route now taken between London and Vienna is that via Belgium instead of Holland, some 140 km. nearer. Vienna is 1,563 km. and Budapest 1,818 km. distant from London via Brussels.

From the computed total of 12,000 km. there must be deducted in the first place 1,956 of trunk cable, so that roughly 10,000 km. of line will have to be erected. Towards this there is 7,269 km. of railway line, so that roughly 73% can be led over an assured route, on which not only all the conceivable conveniences for the building of the line can be obtained by the use of railway trains, but also the care of the workmen, the service staff and the repeater stations is assured. The 1,485 km. of sea cable comprised in the scheme is certainly unsatisfactory. But as the route of the Indo-European telegraph line shows, which also uses a cable in the Persian Gulf and Gulf of Oman, this difficulty is not invincible. This sea-length could only be dispensed with if a land route through Persia could be selected. The question whether on this 1,100 km. length of coast or land cable, an overland construction would perhaps have to be chosen, can only be decided after special investigation. The first thing to be considered is only the possibility of providing the line. From the tables it will be seen that of the total 12,000 km. length of line 16.3% is existing trunk cable, 12.4% is on new sea cable, 60.6% on lines on railways and 10.7% on lines on roads. The existing trunk cable and the railway sections to be used make up roughly 77% of the whole route, from which it is apparent that more than three-quarters of the total route could be decided on straightway.

The foregoing topographical study is intended to discover on broad lines whether and in what way the idea of a trans-continental trunk line can be realised.

The figures of the table of distances will actually be somewhat varied. Exact measurements can only be obtained by the co-operation of the countries concerned. A study of the map shows that other routes come into consideration. It is therefore necessary to deal with the routes already occasionally indicated in the foregoing, such as the route via Eskishehir-Angora (or Geve-Angora), Sivas-Diabekir-Baghdad-Fao-Bushire, or via Erzerum-Teheran to India. Also there is the line from Baghdad via Teheran to Lahore to be considered.

Besides suchlike topographical studies, those of an economic kind are necessary in order to test whether the commercial, political or other economic affairs are of such sort that they will be able to feed a telephone line in sufficient measure and within a reasonable time, so that it will remain "alive" and yield the necessary receipts for its existence.

The ever more distant goals of World Air routes are not forgotten. These considerations lead further to the tariff question, on which again that of the organisation depends. Above all, the technical man will have to be heard, for the suggested plan contains a host of problems. Finally, also, the radio engineer will have a word to say, whose goal lies in the same direction as the foregoing. It will be an important question to elucidate whether in telephony the two services will develop together as in telegraphy, i.e., whether both can exist together and complement each other.

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If we compare the present state of telephone technique with its beginnings in 1877, especially with reference to the question under examination, we can decide with satisfaction that a co-operative fixed objective of knowledge and practice has placed at the disposal of mankind a means of communication in the telephone without which present economic life is as little thinkable as without, for example, railways. On the other hand, it will be agreed that the way up to the present grades of perfection was far more difficult than will be the extension of the telephone to the farthest distances as treated of in the foregoing. In the first case a completely new technique had to be developed and in the present only the application of already proven methods to a special case. Looked at from this point of view the transcontinental telephone extension is no longer a bold project but rather a normal step in the development of a highly developed technique.

W. H. G.

REVIEW.

"Telephone and Power Transmission." By R. Bradfield and W. J. John. (Published by Chapman and Hall.) pp. xi + 238. Price 21s. net.

Transmission Theory has in recent years become one of the most important items in the mental equipment of communication engineers, and of engineers who are concerned with lengthy power circuits.

Unfortunately, the mathematical methods which have to be employed, involving as they do the use of vectorial algebra and hyperbolic functions, are outside the ground usually covered by the ordinary technical student, and consequently, the standard books on the subject are, for him, written in a more or less incomprehensible language.

The difficulties of these mathematical methods are, however, far more imaginary than real, and, once the meaning of the notation employed has been grasped, vectorial and hyperbolic expressions become as easy to handle as those more usually met with. At the same time the student finds himself in possession of a tool by means of which he can solve easily problems which, without the aid of these methods, would be extremely difficult.

The present book has been written for those who need to use transmission theory in the course of their work, but who have not necessarily any advanced mathematical knowledge. It is divided into two parts. Part I deals with telephone transmission and Part II with the transmission of power.

The general mathematical theory involved is the same in each case, and is explained very clearly and from first principles in the first two chapters.

The next chapter deals with the application of the theory to telephone transmission, and the fourth chapter is devoted to the various line constants which have to be taken into account in transmission problems, together with the methods by which they can be measured. This concludes Part I.

The first chapter in Part II deals with the general questions of power transmission, and the next with the effects of the introduction of transformers into the circuit. The seventh chapter deals with travelling waves and "switch-in" phenomena.

The consideration of these transient phenomena, which are of extreme importance in power transmission, is continued in the next two chapters, where the elementary mathematical theory involved is developed.

In an appendix a series of useful tables is given to facilitate the numerical calculations involved in the application of the theory to practical problems.

The book is well got up, and is a valuable addition to electrical engineering literature.

THE POSTMASTER-GENERAL ON THE TELEGRAPHS AND THE HARDMAN-LEVER COMMITTEE.

WE reprint in full for the information of our readers those passages of the Postmaster-General's speech in the debate on the Post Office Estimates which dealt with the position of the telegraphs :—

Coming now to the telegraph service, there was in the year 1927-28, as compared with 1926-27, a slight increase of £40,000 in the deficit, but this is more than accounted for by a change in the method of dealing with the receipts from wireless receiving licences, on the recommendation of the Public Accounts Committee. In previous years these receipts, after payment of the cost of collection and the proportion due to the British Broadcasting Corporation, were treated as telegraph net revenue. However, it is now agreed that it really had nothing to do with the operation of the telegraph service proper, and that it only obscured the accounts. Accordingly, in 1927-28, we are bringing into account on the telegraph side only the 12½% which the Post Office receives as the sum due to cover the cost of collection and enforcement. As far as I am able to ascertain, that 12½% was an extremely good calculation, and almost exactly balances what we estimated for the cost of collection and management of the service.

The decline in the inland telegraph revenue continued in the year, but the position with regard to foreign services was of course much improved. Owing to the inception of the beam wireless service, a new form and a substantial amount of revenue began to come in. Apart from the reduction of the credit for wireless receiving licences, the telegraph revenue, on the whole, improved by about £57,000, while operating expenses, including depreciation, increased by about £32,000. There was, therefore, on the telegraphs a small net improvement of about £25,000. That, however, still leaves a substantial deficit of £1,389,000. About that I shall have something more to say later. On the telephone side, the telephone service working shows a small surplus. Both revenue and operating expenses continue to grow, but the revenue from the trunk service did not show quite the resiliency that I had expected and hoped. No doubt the continuing depression in the heavy industries had something to do with the matter, but there was a period during last year when the trunk revenue did not come up to expectations. However, I am glad to say that there were indications of a distinct improvement in the trunk traffic during recent months.

I ought, however, to point out that some of the comparisons and comments sometimes made by alleged experts, that the result of the combined working of telegraph and telephones shows a loss of something like £1,270,000 a year and that this shows how bad the management is—that sort of comment really does less than justice to the service, and less than justice to the unfortunate Postmaster-General, because such a criticism and such comparisons with great enterprises like the Western Union and the American Telephone and Telegraph Company really distort the facts in at least two very important directions. In the first place it ought to be remembered that it has been the deliberate policy of Governments in this country for many years past, as regards the telegraph service, to run it at rates which do not and cannot pay the community generally, and as far as the telephone service is concerned, it has been the policy to run it by giving back a large proportion of the profits in the form of rate concessions to the users and also of carrying a considerable unremunerative fringe of business in rural areas. Both those facts ought to be taken into account.

That is one of the directions in which I say that comparisons of this sort are really distortions of fact. But there is an even more important way in which that sort of comparison lends itself to misrepresentation. It is really incorrect to compare the results of the services I have given with what you might call the profits remaining available for dividend in the case of a private enterprise. In order to give a true comparison when you are dealing with these accounts, you ought to ascertain what is the figure of the profit or loss which is available to meet interest charges; that is to say you ought to ascertain what the profit or loss is after providing for the sums required for operating, for maintenance, and for depreciation, and see what the resultant figure left is then. That is the figure that is available, subject to the qualifications about the policy of reducing charges and the qualification that while figures in the case of a Government service bear a charge for rates they do not bear a charge for taxes, that resultant figure, the sum that is left after providing for operating, maintenance, and depreciation, to meet interest charges, is the proper comparison with the profits remaining available for dividend in a private enterprise. If you do that, the position takes quite a different shape. You can then see the very real progress which has been made in the last seven years. On that basis the results of 1921-22 working were, that the telegraphs showed, before provision for interest was taken off, a loss of £2,668,771, the telephone showed a profit of £1,095,656, or a combined loss on the joint undertaking of £1,573,115. In 1927-28 the telegraphs showed an estimated loss of £1,023,000, the telephones an estimated profit of £4,201,000, or a combined profit of £3,178,000.

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I must hasten on to say a word about the Inland Telegraph Service. I have already given the general financial results, and the Committee will have seen that there is little change in the general trend of these results. Indeed, there has been very little change in regard to the Inland Telegraph Service ever since 1885, when the 6*d*. telegram was introduced, on a private Member's Motion in this House. There has been since then a continuing deficit, which has varied in the last decade from something like £3,000,000 down to the figure of between £1,500,000 and £1,250,000 at which it stands now. I mention this because, possibly largely owing to the way in which, no doubt from considerations of space, the Report of the Hardman-Lever

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Committee has been recorded in the Press, it is undoubtedly a fact that the impression has been produced on the public mind that an entirely new and unsuspected state of financial decrepitude has been revealed by an inquiry which someone has forced on a reluctant Postmaster-General.

The facts are, of course, entirely contrary. I found that for two generations every Government in turn, Liberal, Conservative, Coalition, and Socialist, had always accepted this substantial loss on the working of the Inland Telegraph Service as something inevitable; and, apart from the very simple expedient resorted to by the Administration of the right hon. Member for Carnarvon Boroughs (Mr. Lloyd George) of doubling the charges, they had accepted this position. I ought to except Mr. Hobhouse when he was Postmaster-General, because Mr. Hobhouse did appoint a committee of very much the same sort as I recently appointed, but the war intervened, their work was cut short, and nothing further was done in that direction. Having regard to this fact and to the views which I held on the subject, I started in the Department two years ago a review of the administrative position with a view to securing further economies. We reached certain conclusions and began the necessary revisions, but it was clear that even with those revisions, which were obvious, there was still going to be a very large gap.

All sorts of suggestions were made, from all sorts of quarters, as to how that gap should be filled—from Members of Parliament, from the Press, from private individuals, and from commercial organisations—and they all had different methods. Some were in favour of increasing charges, some were in favour of reducing charges, some were in favour of zone charges, some were in favour of a system of inverted zone charges; and so I decided that I would invoke the aid of three of the best business brains that I could command and ask them to advise whether anything, and, if so, what, could be done to fill up this gap. I deliberately asked three gentlemen from the outside world, not, as has been suggested, because I was anxious to use their Report as ammunition for an attack on a Government Service, but because, having lived, as I have done, in both worlds, I knew the difficulties which inhere in Civil Service administration, and I wished to see how far they regarded the problem as soluble as a matter of administration, and, if so, how far any of their plans could be dovetailed into the system.

The answer is frankly disappointing, because the Committee found that, even given the most favourable conditions of management by private enterprise, on ordinary commercial lines, the gap could not be filled, and their only suggestion for effecting a substantial reduction in the gap lies in an increase of rates to the public. I am not altogether surprised, because I had reached practically the same conclusion from the inquiry which I made myself, but I am most grateful to the Committee for their examination of this very difficult problem, and although I do not agree altogether with all their conclusions, I think the only matter that calls for criticism and regret is that the most vital paragraph in their Report is so worded that inferences have been drawn from it by critics which are really quite unfair and quite unwarranted by the facts. This matter is really so important that, at the risk of detaining the Committee for a few moments longer, I must explain exactly what has happened. The Committee say, in paragraph 24 of their Report:—

> "It is difficult for the Committee to express in figures what savings might be effected with an efficient staff and management; but in the course of the inquiry evidence was given by practical telegraph men that on the assumption of a free hand as in a commercial enterprise, and with a wider use of machine printing telegraphs, savings varying from 20% to 33⅓% of the present operating staff costs could probably be made, and the Committee see no reason to disagree with this view."

This paragraph has been widely quoted by critics as amounting to a statement that the present conditions are so inefficient that, if properly revised and with a free hand, operating costs can be cut down by from 20% to 33⅓%; and I am not saying that operating costs cannot be cut down. That is precisely what I have been trying to set out to achieve, but I confess that when I read that statement it staggered me, because I thought it was most remarkable that, after I had been groping after savings for months, it should be suggested that the operating heads of my own Department should all the time have had these savings lying right to their hands; and I may tell the Committee at once that I demanded to know what were the savings which had been suggested, and why they had not been suggested to me. When I went into the facts, I found, as no doubt some Members of the Committee have already guessed—those, at least, who have had experience of control of largish undertakings and who know what the methods of the operating side are—that what they said was something quite different. The evidence, so far from supporting such a conclusion, simply negatived it.

What the operating heads said was exactly what the operating side always does say under these circumstances, namely, that their estimated savings in costs from 20% to 33⅓% were not absolute; they were hypothetical. They depended upon the creation of a set of conditions ideally perfect from the point of view of operating costs of production, but which had and could have no relation whatever to actual practice. What did they postulate? Their postulate was, in the first place, an entirely new Central Telegraph Office, with the transfer of all the mass of cables to the new situation, at a capital cost which I have not begun to attempt to measure; in the second place, a large expenditure on new apparatus; in the third place, the ruthless scrapping of all operators except those of fullest vigour; in the fourth place, a system of piecework; and, in the fifth place, a slowing down of the speed of service. Shortly, they said what the operating side always does say under these circumstances, namely, "We can give you such-and-such a reduction in operating costs if we are given absolutely new machinery, piecework rates, and the maximum of efficiency output."

I am not for a moment suggesting that these gentlemen who expressed these views to the Committee either recommended such progress as financially wise or as being just to the staff, but they did answer, to the best of their ability, the question, "If you had a free hand, how far could you cut costs?" It is a little difficult, however, to read this from the wording of the Report, and still more from some of the glosses placed on the Report by the critics. I am very sorry still to detain the Committee, but there is so much ground to cover. I will bring my observations to a close at this point if it is desired, but I think it is a little unfair that I should be asked to do so, because there has been a certain amount of comment with regard to the observations of the Hardman-Lever Committee on the work of the Inland Telegraph Service, and this is the first opportunity I have had of saying anything at all about it, in Parliament or outside. I will try to be as short as I can, but there are one or two things I ought to say, because the position has been left rather obscure, and I think I ought to do what I can to clear up the points.

I have cleared up already one of the points which was most obscure in the Report, and I should like to say this further, that the existence of a deficit on this portion of the Post Office work is not a phenomenon which is singular to Great Britain. On the contrary, it is the common experience of practically every Government in Europe. They take the view that an efficient telegraph service confers such advantage on the citizens in general, and in the amelioration of conditions of life in general, that it is worth running, even if it be run at a loss. There is much to be said for that, and it ought to be borne in mind by some of those who are always rushing off to America for comparisons with regard to telegraph work in order to draw conclusions derogatory to State management. It is not my business to indulge in any party polemics to-day, and as I have said before, I am not enamoured of State trading. Although it has fallen to me during the last 12 years to have had more association with the conduct of State trading than any other man in this country and, I think, probably than any other man in the world, except Mr. Hoover, I am still not enamoured of it. This is not the occasion for discussing that question, but I do recognise that the case against State trading is only weakened by fallacious comparisons.

I read one scribe who contrasted the deficit on the Inland Telegraph Service here, according to the Hardman-Lever Report, with the enormous surplus gained by the American Telephone and Telegraph Company. He founded on that an argument against State management, but when I read that sort of thing I am inclined as an anti-Socialist to say "Heaven save me from my friends," because the American Telegraph and Telephone Company have nothing telegraphic about it except its name. It does not operate one single mile of telegraphs. The real truth is that the conditions of physical geography in America and the large distances between centres materially contribute to help telegraphic developments.

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I should like just to make this point, that distance in America is *pro tanto* an advantage to the development of a telegraphic system, because they do not get the same competition with mails as is the case in this country. For instance, take the distance from New York to Chicago and from Glasgow to London. If a man in New York makes up his mind at six o'clock on a Monday afternoon to post a letter, and he wants to communicate with Chicago and posts the letter, it reaches Chicago the first delivery on Wednesday morning. A man in London, however, has the first delivery on Tuesday morning of a letter posted at the same time for Glasgow. If the American wants to telephone, it costs him 3.25 dollars or 13*s*. 4*d*. It costs the Englishman 5*s*. 9*d*. For a telegram of 20 words, it costs the American 95 cents or 3*s*. 11*d*., and in England it costs 1*s*. 8*d*. Therefore, from the geographical point of view alone, there are considerable natural advantages which a telegraph service enjoys in a large country like America, which is not enjoyed by the telegraph service in a comparatively small country like ours.

I might say of the Report of the Hardman-Lever Committee that, although it is very helpful in many respects, it seems to me to lack definiteness, because they failed to distinguish between, on the one hand, a less costly telegraphic service, and on the other hand, one getting greater speed. It is possible to achieve either of these alternatives, but you can only gain acceleration in speed by an increased operating cost, and that cost increases in geometrical ratio to the increasing speed. The Committee will appreciate this if they realise how large are the variations in peak load, which occur not only in the course of the day, but between one month and another. The peak load in the Central Telegraph Office varies from a minimum rate of 2,000 telegrams an hour between 8 a.m. and 9 a.m. up to a peak load of 12,000 an hour between 11 o'clock and noon. Its variations from month to month can be seen by the fact that there were 2,000,000 telegrams in February, and 2,700,000 in July. It will therefore be seen that, if you are trying to get anything like a normal rate of speed, you have to try and have your system so adjusted as to deal with the normal rate of traffic. If you get extra acceleration, you can only do it at the expense of having too many staff. To get an acceleration at the peak hour, you will find yourself with a surplus of staff when the peak is at the lowest. It is fair to say in this country that our average normal speed challenges comparison with any other country. In the United States there are two great systems, the Western Union and the Mackay, and where there is competition you get an excellent service. In the towns of America the telegraphic service is very much worse than our own, and in the rural parts of America it ceases really to have any pretensions to be a telegraphic service at all. In Germany the ordinary telegraphic service is much slower. They have a system of urgent telegrams at triple the ordinary rate, and a lightning service at 30 times the ordinary rate.

Our best service in this country compares favourably with the best American practice, and with the German lightning service. Our average normal speed of telegraphic operations is certainly up to that of any other country in the world, and is I think a great deal better than most of them. Indeed, I believe it is true to say that it is better than any other.

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TELEGRAPHIC MEMORABILIA.

AUSTRALIA.—The Sydney correspondent of the London *Daily Telegraph* under date June 29, telegraphed the following regarding Australia's first year results of Beam and Cable working :—

"The figures for the cable and wireless traffic from April, 1927, to March, 1928, covering the first year of the beam service, show that the latter obtained slightly over one half of the total of the United Kingdom traffic. The total figures for all classes are 14,136,000 words, of which the beam secured 7,131,000, the Pacific Cable 3,050,000, and the Eastern 3,920,000, the combined cable services being 161,000 words behind the beam.

"The fact that cable services carried nearly 7,000,000 words of the United Kingdom traffic alone indicates that they are still an important factor in Australia's communication problem. The cable services retain the major portion of the commercial traffic, the beam proportion of the full-rate messages being only 30%, but the beam secured three-fourths of the week-end and daily letter traffic. The cables obtained the larger share of the deferred Government and Press messages and of the Christmas and New Year greetings."

Mr. Wm. Gibson, Postmaster-General, stated that the Government "had not been informed of the reported completion of the agreement of the Imperial Committee on cable and wireless interests. The Committee, he stated, was not authorised to complete an agreement, but must report the result of its deliberations to the various Governments concerned. It was essential that a plan should be evolved to bring all interests together, as the cable companies with their huge capital are unable to compete with the wireless on a commercial basis. Cables, however, must be preserved for defence and other purposes.

The Commonwealth has continued the policy of a toll on communications, charging a terminal rate for the new beam service to the United States of fourpence a word on ordinary messages, and one penny for Press telegrams."

The Australian Press announce the formation of two new broadcasting companies. One is the Dominions Broadcasting Pty., Ltd., registered in Melbourne with a capital of £200,000. It is to acquire the businesses carried on by the Broadcasting Co. of Australia Pty., Ltd., and the Associated Radio Co. of Australia, Ltd. The other is the New South Wales Broadcasting Co., Ltd. (Sydney), capital £100,000. This company will acquire the broadcasting licences of 2FC, Ltd., and 2BL, or Broadcasters (Sydney), Ltd.

On July 3 Reuter's Canberra agency stated that "the Postmaster-General states that experiments at present proceeding indicate that 'beam' telephony between Australia and England will soon be established on a commercial basis," to which the *Daily Telegraph* rejoined that enquiries in London and at Marconi House failed to elicit any confirmation of this statement.

The Electrical Review informs us of important developments in Commonwealth wireless communications in the proposal to establish a station at Canberra with a range of 5,000 miles, enabling the Government to have ready means of communication with the remainder of the Empire and ships at sea. The scheme is intended to supplement the short-wave "beam" radio and submarine cable services, and the *Financial News* says that Mr. Brown, Director of Postal Services, is at present in London consulting the authorities on the subject of the new station, which is to be the last link in the Empire chain, enabling rapid direct communication in all circumstances.

CANADA.—The two following paragraphs are supplementary to information which appeared on this matter in our last issue, and are respectively gathered from *The Electrical Review* and Reuter :—

"A further important development in the use of the Marconi short-wave 'beam' system for Imperial communication took place on June 16, when the 'beam' stations built for communication between Canada and Australia were officially opened for public service. Hitherto 'beam' messages from England could be transmitted over two routes direct to Australia, one eastward over Northern Europe, Russia, and China, and the other westward over the northern part of South America and the Pacific. With the opening of the Canada-Australia service a third route by which messages can be relayed through Canada was added to supplement the other two routes in case of need."

"The messages travelled by the Canadian Marconi Co.'s 'beam' circuit between Melbourne and Montreal, whence they were relayed by the short-wave system of the Radio Corporation of America to Washington ; the Corporation thus now has a direct service from New York to Australia."

The Vancouver correspondent of the *Daily News* recently published an interesting report of one of the latest practical uses to which radio has been applied in Canada, viz., that of "prospecting for ore."

"The scientific prospector is at work," says the informant, and the system is apparently in use in more than one mining area.

"The equipment consists of a transmitter—a big tripod loop with water levellers for working on uneven surfaces—and a receiver, operated by four men. The transmitter is set up on the property, and the receiver is taken from place to place. It is pointed at loop and the signals are checked to zero when received. The call 'line' is to tell the operator at the receiver where to focus on the loop. 'O.K.' and two whistles are a check report.

When these are received, the transmitter working on a wave of 3,000 metres, is turned on, and the signal is picked up from electric conductors underground, which are sulphide bearing ore deposits that re-radiate the signal to the receiver.

The angle of the signal is obtained, and the receiver is moved to another location, which should show another angle.

These angles constantly grow smaller and smaller, to zero, when the receiving operator checks his location by converging on it from the opposite direction. If zero is again proved, the location is over a sulphide bearing deposit. The depth is ascertained by signal intensity.

Should a number of zero spots be located at different places and no angles are disclosed, it is due to the fact that there is no electrical conductor underground to radiate the signal.

This method of prospecting is called the 'radiore' system. The apparatus does not give the nature of the ore body located ; whether or not this is commercially valuable must be proved by drilling."

Reuter's agency states that the Canadian Government has issued a licence to the Canadian Marconi Wireless Telegraph Company for the establishment of a service between Montreal and New York. A contract has been entered into with the Radio Corporation of America.

The Elimination of Interference in Canada.—There is something very thorough in the following measures taken in Canada to track down interference, according to *World Radio*. Throughout the Dominion in town and village practically all electric power is carried overhead on poles ; 80.7% of the interference with broadcast reception reported last year was traced to overhead electrical distributing systems or power lines. All the revenue, amounting this year to approximately £40,000, derived from receiving licences is devoted in Canada to the suppression of electrical interference. This service, undertaken by the Radio Department of the Ministry of Marine and Fisheries, Ottawa, now covers the whole country. Fifteen cars visit in the course of the year most of the principal towns in Canada, and are touring the prairie provinces now that the roads are open. The most important apparatus carried on the cars consists of a superheterodyne receiver with a direction-finding loop, by means of which the investigator is able to associate interference, reported to him by listeners or dealers, with certain particular lines. The cars also carry small portable receivers fitted with exploring coils for investigations in power houses. In case interference is not to be heard when the investigator visits the town from which it has been reported, he endeavours to produce artificially such conditions as will cause the interference to start. Having the permission of the public utility companies to do so, he strikes poles carrying transformers and other electrical apparatus and shakes the guy-wires, causing the power lines to swing and vibrate as they would in windy weather, or when heavy traffic passes along the road. At the same time his companion in the car listens with ear-phones for electrical interference set up in the system by the vibrating pole, causing a bad contact or poor insulation to become apparent, and when the source is found the public utility companies take steps to repair the fault ; if found to originate in some privately-owned electrical apparatus the owner is asked to take steps to eliminate the interference, and in this case the investigator assists the owner in testing his apparatus ; where it is caused by the normal operation of electrical apparatus, the investigator will try the effect of various types of preventive devices which are carried in the car. When it is possible to prevent the interference by such means, generally the owner will buy equipment which is supplied at cost from the Radio Department, to stop the nuisance. Frequently, radio interference indicates defects which may in time cause serious damage from fire, electric shock or damage to plant ; so in a number of cases the companies themselves employ electricians to detect and prevent radio interference. Local wireless clubs and wireless dealers co-operate with the investigators in this vital service to listeners. Feeling is so keen that there is a general drive to clear up the trouble in towns where interference is most persistent. The following summary of the sources of interference investigated during the year ended Mar. 31 last, and the results are eminently satisfactory :—

Sources investigated—		
Domestic electrical appliances	291	5.3%
Electrical power lines	4,383	80.7%
Commercial electrical apparatus	610	11.2%
Radio apparatus (amateur and commercial)	152	2.8%
Total sources investigated ...	5,436	100.0%
Action taken—		
Number of sources definitely reported cured	4,880	89.8%
Number of sources not yet reported cured	465	8.5%
Number of sources having no economic cure	91	1.7%

EAST AFRICA.—The British Postmaster-General announced on June 15 that a direct radio-telegraph service had been inaugurated that day between England and Kenya and Uganda.

The British East African Broadcasting Corporation owns and operates the service from the African end.

The first broadcasting station in East Africa was opened on June 14, states the Commissioner of H.M. Eastern African Dependencies Trade and Information Office. The new station is situated in Kenya, a few miles out of Nairobi, the capital of the colony, and the enterprise was locally promoted and financed. Lord Delamere is chairman of the British East African Broadcasting Co., which is under the management of Commander L. Mansfield-Robertson, a well-known naval airman. Kenya is the third British colony to possess a short-wave broadcasting station.

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From another source it is stated that "a series of experimental programmes would begin in the middle of last month." The two statements above are only apparently contradictory, and in any case the new station is now actually working, and that is all that really matters.

FRANCE.—It is reported that the Eiffel Tower station is undergoing complete transformation, says *The Electrical Review*. The power is to be increased to 100 kw., and the wavelength is to be reduced to 1,500 metres.

According to the *Wireless Trader*, the company which manages the Radio-Lyon station is increasing the power of its transmissions to 25 kw. The new station will be situated about eight miles outside the city, so that it will not interfere overmuch with its immediate neighbours. Accommodation for 100 performers is available in the studio, which will be in the centre of the city. It remains to be seen whether the necessary permit will be obtained.

Government Bill to Secure State Control.—Reuter's Parisian agency informs us that the Government, on June 29, tabled a Bill regulating wireless transmission in France; it is hoped to secure its adoption before Parliament rises. The Bill asserts the principle of State control of transmitting stations, which may either be worked by the State itself, or be leased for a period not exceeding ten years. A special Broadcasting Department will be created and placed under the control of the Minister of the Interior; its function will be to co-ordinate broadcasting from the various stations with particular reference to the preparation of programmes. An important provision of the Bill imposes taxes to meet the expenditure of the new Broadcasting Department. It is proposed, first, to enforce a small annual tax on receiving sets, varying from 10 to 20 francs per annum; secondly, to put a 4% tax on the retail price of valves; thirdly, to put a tax of not less than 20% on the revenue of transmitting stations from advertisements; and, lastly, to demand a share of the profit of private stations.

More Money for Telegraphs and Telephones.—The same agency reports that a loan was issued on June 25, the proceeds of which are to be used for bringing the telegraph and telephone services up to date. New long-distance telephone cables are to be laid down, the automatic telephone is to be installed in Paris and the big provincial towns, more rapid transmission by telegraph is to be provided, and automatic transmitters fitted, &c. Improvements are also planned for public wireless services, while a sum is to be set aside for larger and more convenient post offices. Five-hundred-franc bonds will be issued, which will be inscribed in a special column of the Public Debt; they will bear interest at 5%, and will be redeemable in a maximum of thirty years at par, bonds being redeemed by drawings every six months and also by purchases on the Bourse. The bonds will be exempt from any special taxation. The issue price has not yet been announced.

International Telegraph Users Committee.—A new international body has recently been formed for the purpose of representing the users of the telegraph—the Committee on International Telegraphy of the International Chamber of Commerce, whose activities will be directed to the improvement of telegraph services generally. Inquiries will be undertaken periodically with this aim in view. The Committee has already held its first meeting at the Paris headquarters of the International Chamber of Commerce. Among the questions under discussion was that of the reduction of code words to five letters, which is to form the object of the Congress of the International Telegraph Union which meets in Brussels in September of this year. Demands have been made that if this system is adopted it should no longer be required that code words be pronounceable, and that rates should be reduced by 50%, otherwise the reform would offer to the users but slight advantages over the present system. The Committee was unanimous that the proposed reform should not entail additional expense to the user. This recommendation will be embodied in the report which the International Chamber of Commerce proposes to lay before the forthcoming Congress.

GERMANY.—Arrangements are well in hand for the holding of the International Radio Exhibition in Berlin from Aug. 31 to Sept. 9 next. Intending British exhibitors can obtain particulars from the organisers at 22, Queen Elizabeth Strasse, Charlottenburg.

Radio "pirates" (Schwarzhörer) to the number of 551 were sentenced from January to March, 1928, says *World Radio*, compared with 558 during the same period in 1927 and with 618 in the last quarter of 1927.

GREAT BRITAIN.—*Parliamentary Questions.*—On June 28 Mr. Hore-Belisha asked the Postmaster-General whether the recommendations passed at the conference of radio experts at Washington last year on the matter of broadcasting, including the recommendation to prohibit the use of spark transmitters, had been considered by his department; and, if so, what action it was proposed to take.

Viscount Wolmer, who replied, said that the International Radio-telegraph Regulations drawn up at the Washington Conference last year provided for a gradual reduction in the use of the spark system. Under those regulations no *new* land station might be established on the spark system, and the use of spark transmitters by land stations was to be discontinued entirely by the end of 1934. The regulations permitted the use of spark transmitters on ships, although after the end of 1929 no *new* spark transmitter might be installed of higher power than 300 w., and after the end of 1939 no spark transmitter of higher power than 300 w. might be used on a ship. The new regulations would be applied in this country, and a start had already been made in the work of converting British coast stations from the spark system to a different system.

On July 3 Sir A. Sinclair asked the Postmaster-General whether, in view of the frequent interruptions to which users of wireless receiving sets were subjected in Wick and nearby stations by the Wick wireless transmitting station, he was yet in a position to state when continuous wave equipment would be installed in Wick in place of the present spark apparatus.

Sir W. Mitchell-Thomson said that extensive building operations would be necessary before the new equipment could be installed at the Wick station, and as the work of reconstruction must be carried out without interfering with the normal working of the station it would necessarily occupy a considerable time. The preparation of plans and specifications was at present in hand, and it was hoped to complete the work during next year.

On July 4 Lord Wolmer, the Assistant Postmaster-General, informed Major Carver that the number of wireless receiving licences in force was just over two and a half millions.

On July 5 Mr. Kelly asked whether the Post Office staff was engaged on work for Trinity House on electrical communication with lighthouses and light-vessels.

Lord Wolmer said that no Post Office staff was inclusively engaged on work for Trinity House. The communications with the Trinity House lighthouses were part of the public telephone system, and were worked and maintained by Post Office staff in the ordinary course. The wireless telephone installations on light-vessels were not provided or worked by the Post Office.

Private Companies' Reports.—The Eastern Telegraph Co., Ltd., has declared a dividend of 2½%, free of tax, on the ordinary stock for the quarter ended June 30.

The Eastern Extension, Australia and China Telegraph Co., Ltd., has declared a dividend of 5*s.* per share, free of tax, in respect of the quarter ended Mar. 31 last.

The Globe Telegraph and Trust Co., Ltd.—Sir John Denison-Pender, G.B.E., presiding at the annual meeting on June 26, said that the one item calling for comment was the disposal of the company's shares in the Great Northern Telegraph Co. That action, continued the Chairman, was taken in view of the disturbed conditions in China, where the Great Northern Co. was greatly interested; the high prices of the shares gave the directors a favourable opportunity of selling them and a profit of £9,770 was realised. The proceeds would be re-invested as suitable opportunities arose, but it was becoming very difficult to purchase telephone and telegraph securities, to which the company was limited. During the year they had been allotted 100 ordinary shares in the United River Plate Telephone Co. at par, and they were to receive 100 new shares of the American Telephone and Telegraph Co. at par. Negotiations were still proceeding with respect to the American Telegraph & Cable Co. A committee had been formed, on which the company was represented, to discuss the matter with the Western Union Telegraph Co., but up to the present no scheme had been put before the shareholders. Referring to the proposed cable-wireless merger, the Chairman said that further progress awaited the report of the Imperial Cable and Wireless Conference which had been examining the question for nearly six months. The Eastern and Associated Telegraph Companies continued to carry a larger volume of traffic than the "beam" services in spite of the lower rate of the latter. It was clear, therefore, that the cables still held a definite and important part in the communications of the world. At the same time they could not afford to lose the traffic which the wireless system at a lower rate took away from them.

The report for the year ended May 31 records a net profit of £343,288, to which is added £51,375 brought forward, making £394,663. A final dividend of 5*s.* per ordinary share was paid on June 30, making the usual total of 10%, free of tax, for the year. The general reserve receives £20,000, leaving a balance of £52,322 to be carried forward. The report contains a list of investments, the principal being the Eastern Telegraph Co., Ltd., ordinary (nominal value £1,258,915), Eastern Extension, &c. (£973,200), and the Western Telegraph Co., Ltd. (£679,000).

W. T. Henley's Telegraph Works Co., Ltd.—A final dividend on the ordinary shares of 2*s.* 6*d.* per share, making 4*s.* per share for the year, and in addition thereto a cash bonus of 1*s.* per share was paid on the 13th ult.

India Rubber, Gutta Percha & Telegraph Works Co., Ltd.—Though not at a meeting, the following communication in the form of a letter to the shareholders, was authorised by the directors, who state that conditions still remain very difficult. In nearly all sections of the business the actual turnover was less than in the corresponding period of last year, but, notwithstanding this, the loss on trading has been very materially reduced, due to a large extent to economies effected in many directions.

The Marconi's Wireless Telegraph Co., Ltd., duly declared the dividend on the 7% cumulative participating preference shares for the half-year ending June 30.

The directors have also announced their intention to redeem the whole of the outstanding 6½% convertible 10-year debenture stock on Oct. 1. The redemption will be made in cash with a 5% premium. The option to exchange these debentures for shares will expire on Sept. 9.

The Telegraph Construction & Maintenance Co., Ltd., have paid an interim dividend of 2½%, free of tax, as last year.

Considerable interference with the transatlantic submarine cable *and* radio-telegraph services was experienced owing to a magnetic storm which made itself felt at midnight on Saturday, July 7, the effects being pronounced. Nature was apparently endeavouring to mete out even-handed justice to both systems!

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The long-talked-of and long-expected new high-power broadcasting station of the British Broadcasting Corporation should soon be well on its way, as the most suitable site has been chosen and negotiations were actually completed on June 29 for the acquisition of an area of land of considerable dimensions near Potter's Bar. The land is on the Brookman's Park estate, which adjoins the Great North Road.

The new station will be the first to be erected under the regional scheme, and when completed it will be the most up-to-date station in Europe. A land line will be laid to it from Savoy Hill, and when broadcasting is started there the present transmitter in Oxford-Street will close down.

Statistics of British exports of radio apparatus during April are given by the *Wireless Trader*. The total value (excluding re-exports) was £96,164 (including valves £15,317). The leading customer was Australia, whose share was valued at £17,045 (valves £6,343). The next in order was France, which took goods to the value of £8,945 (valves £14). Other important markets were the Netherlands, £7,106 (valves £70); Spain, £5,616 (valves £134); Indian and Burma, £5,042 (valves £1,166); and Germany, £4,536 (valves £58).

The Bridgwater Experiments.—Experiments which are now being made at the Marconi "beam" station at Bridgwater indicate, says the *Electrical Review*, that wherever a short-wave "beam" telegraph service is conducted a telephone service may also be established, while the new "multiplex" apparatus that has been developed enables one set of apparatus and aerials to conduct simultaneous telephone and telegraph services. During the present tests at Bridgwater, a party listened to dance music which was being received from Montreal at the same time, and with the same apparatus and aerials, as two Morse telegraph services from Montreal. The demonstration was given to Mr. David Sarnoff, vice-president and general manager of the Radio Corporation of America, and Mr. W. A. Winterbottom, traffic manager of the Radio Corporation of America, by Senatore Marconi and Mr. G. A. Mathieu, the research engineer who has been working in close collaboration with him in the development of the Marconi-Mathieu multiplex system. The Bridgwater "beam" station is the receiving station for the commercial telegraph service between this country and Canada, and was built in 1926 by the Marconi Company for the General Post Office, which has allowed the use of it for the present experiments, which do not impede the commercial telegraph service, for another channel is used to carry on the present traffic between Canada and England. "With the multiplex system the wireless telephone channel can be run in connexion with the telegraph channel and might be regarded as a kind of 'bonus,' for instead of having only one channel of communication between each transmitter and receiver the multiplex system gives three or four at the same time."

The speech-amplifying equipment used at the Hendon aerodrome for the Royal Air Force Flying Display was, as on previous occasions, installed by the Marconiphone Company. This year yet another increase in the size and scope of the apparatus was evident, 40 powerful loudspeakers being used. Microphones were employed for announcements, descriptions of the events, and for relaying the band music. To provide adequate volume special amplifier panels were constructed, and over 120 super-power valves were used, 96 of them forming the last stage alone. Over one kilowatt of power was delivered to the loudspeaker circuits by the equipment, distributed through ten miles of wiring specially buried below the surface of the ground. The total weight of the equipment, excluding wiring, exceeded five tons.

The conditions at this stupendous gathering naturally demanded something special in the way of loudspeakers, as it was necessary to overcome the roar of dozens of engines and the noise of a crowd of over 100,000 people. Under normal conditions the speakers used could be heard two or three miles away.

Considerable publicity has been given regarding mains-operated equipment for radio purposes and the possible dangers to life and property of this type of apparatus when fitted by the inexperienced. It is therefore highly satisfactory to note that additional regulations "in respect of radio apparatus connected to electric supply mains" have been issued to the Ninth Edition of the I.E.E. Regulations for the Electrical Equipment of Buildings. *The Electrical Review*, which has drawn attention to this matter in company with other electrical journals, for some two or three years, says very truly: "This risk is a very real one, and we hope that users of radio apparatus, in their own interests, will take pains to guard against it. As we have previously suggested, the B.B.C. ought to broadcast a warning on the subject from time to time"; and re-urges that this risk is aggravated when battery eliminators are used.

The regulations have been prepared by a sub-committee on which the Radio Manufacturers' Association and other interested bodies were interested. Having read over the regulations, one is struck by the completeness and the range of the precautionary measures embodied in these protective regulations. From a mere layman's point of view they appear to have covered every possible contingency. The *Electrician* adds: "The Association has now approved the regulations, and will endeavour to arrange that all radio sets manufactured by its members comply with them. The fact that this question has been settled before the opening of the National Radio Exhibition should tend to make the exhibits at Olympia even more interesting, for whereas hitherto mains-operated apparatus complied only with the requirements of the manufacturer, both design and method of connecting have now been brought into line with other domestic and industrial appliances.

That the unobtrusive work resulting from the decisions made and the measures taken to control the frequencies of Europe is not in vain, the following paragraph is full witness: "In its June 15 issue, *World-Radio* published a useful chart of the measured frequencies of the majority of the European broadcasting stations using the medium (200 to 600 metres) waveband of from 1,500 to 500 kilohertz (1 kilohertz = 1 kilocycle per second) for the month of May. It is a reproduction of the official chart of the Brussels frequency-checking station of the Union Internationale de Radiophonie, and our contemporary hopes to publish during the third week of each month a similar record for the previous month. The apparatus used at Brussels permits of the actual measurement of frequency to one part in 10,000, whereas limitations of space in reproduction reduce the accuracy with which the chart may be read to one part in 1,000. It is a graphical record of the wave-repartition "Plan de Genève," which was put in operation on Nov. 14, 1926, and indicates how stations have varied during the month from the frequencies allotted to them. It is claimed that the chart shows the Geneva plan to have been successful in at least 80% of the cases."

IRELAND (Northern).—At a recent meeting of the Londonderry Chamber of Commerce, the Post and Telegraph Committee of the Chamber was re-appointed for the ensuing year. Councillor Magee availed himself of the occasion to inform the Chamber that he had learned that a new telephone cable was to be laid from Great Britain to Donaghadee. He considered that at the same time a telegraph cable should be included, which would restore the direct communication which Londonderry had with Great Britain in former years. As it was, there was very considerable delay in telegraph communication owing to the necessity for the retransmission of messages. The Chamber decided to appoint Councillor Magee on the Postal and Telegraph Committee with a view to seeing to this matter.

IRISH FREE STATE.—*The Telegraph Bill.*—In Dail Eireann, on June 27, the final stage of the Telegraph Bill, under which the minimum charge for a telegram is increased from 1*s.* to 1*s.* 6*d.*, was passed by 59 votes to 33. President Cosgrave said that this was one of the services which, by reason of the economic situation in the country, was rather more burdensome than it might otherwise be. He added that even this impost would not meet the entire demands of the service.

JAPAN.—It is stated that the North German Marine Cable Works Co., Nordenheim, has received an order from the Japanese Government for a marine cable 90 km. in length. This is the first time since the war that the Japanese Government has placed a contract of this extent in Germany.

KENYA COLONY.—(See East Africa).

POLAND.—It is *reported* from certain quarters, and more definitely stated in others, that the Polish Government is in negotiation with the International Telegraph and Telephone Corporation with regard to a credit of 300,000,000 zloty for the development of the telephone and telegraph system in Poland. The loan is intended to be chiefly applied to the substitution of underground cables for the present overhead network. The amount in sterling is between six and seven million pounds.

RUMANIA.—Mr. R. J. E. Humphreys, British Commercial Secretary at Bucharest, in the course of a report to the Department of Overseas Trade on economic conditions in Rumania, says that broadcasting rights have been conceded to a Rumanian company which is to construct two stations. Since the company began to operate, the importation of radio apparatus and parts has increased, and may be expected to increase still further. Rumania is a market which should not be neglected by British manufacturers of such apparatus. A programme of telephone and telegraph work to cost about £12,000,000 has been prepared; this includes the laying of cables from Bucharest to the western frontier through Ploesti and Brasov with branches to some of the larger towns. An automatic telephone system has been installed in part of the Bucharest area, and it is desired to completely convert the capital's system and to extend automatic working to other of the more important towns. An appendix to the report shows the various weights of electrical machinery imported in six months from eight European countries. Mr. Humphreys considers that British manufacturers would be advised to begin to introduce their goods in anticipation of the improved foreign trade which will follow the economical consolidation of the country. A certain amount of caution is necessary, and careful inquiries should be made, when credit is granted, as to the reputation and financial standing of prospective customers. It is not advisable to give open credits, but only against acceptances. Reliable agents are essential, and in this direction the Commercial Secretary offers his assistance to British firms. The report itself may be obtained from His Majesty's Stationery Office, price 2*s.*

SOUTH AFRICA.—An important Bill, introduced by the Minister of Posts and Telegraphs, to amend the South African Radio Act of 1926, has been introduced in the Union House of Assembly, says *World-Radio*. A section of the old Act is to be repealed and another substituted which provides that any person who erects, maintains, uses, or has in his possession any radio apparatus without an appropriate licence, or permit, as required by the Act, shall be liable to conviction with the penalty of a fine and/or confiscation of apparatus and cancellation of licence. Sub-section 2 of the Bill prohibits the sale, or gift, or supply, of any radio apparatus from one person to another unless he holds a licence to deal in, or permit to transfer, such radio apparatus, issued by the Postmaster-General. (Such licences, each of which shall expire on Dec. 31 next succeeding the date of its issue, and such permits may be granted free of charge by the Postmaster-General), and under sub-section 3 it is an offence for a person licensed under sub-section 2 to deal in radio apparatus, if he sell, give, or in any manner whatever supply, any radio apparatus (*a*) to any person who is not the holder of an experimenter licence, a broadcasting licence, or a listener's licence; and (*b*) unless he keeps a true record of such transaction by means of an invoice written by him or under

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his direction and signed by him at the time of the transaction, setting out the date of the transaction, his name and address and the name and address of the person supplied. The last clause of the amending Bill attempts a new definition of the words "radio apparatus." It says: "'Radio apparatus' means any radio aerial, radio crystal set, radio loudspeaker, or radio telephone receiver, and includes any other article used for radio which the Minister has from time to time declared to be radio apparatus, provided that the Minister may at any time cancel any such declaration."

SWEDEN.—Reuter's Trade Service, Stockholm, says that the annual report of Telegrafstyrelsen shows that Sweden's telephone system continues to make further steady progress. During 1927 the number of telephone subscribers in Sweden increased by 15,000 to 453,500. Telephone communication with foreign countries was extended in 1927 to Great Britain, France and Belgium, and foreign traffic increased considerably. The largest number of conversations was with Denmark (260,000). Inland telegrams during 1927 numbered 2,719,000, and foreign terminal telegrams 2,544,000. These figures represent a considerable increase in foreign telegrams and a slight decrease in inland telegrams. The income derived by Telegrafverket from telephones and telegraphs increased during 1927 by Kr.3,500,000 to Kr.86,500,000, while expenditure rose by Kr.2,400,000 to Kr.67,600,000. The net profit increased by Kr.1,100,000 to Kr.18,900,000, or 6½% on the invested capital.

From the same agency we also learn that the number of wireless receiving licences issued in Sweden showed a further increase in May, the number on the last day of the month being 363,863, as compared with 360,059 at the end of April.

U.S.A.—It was announced on June 25 that the Transmitter Section of the National Electrical Manufacturers' Association Radio Division had recommended that radio broadcasting stations be classified as to power thus: 0.5 kw., 5 kw., 50 kw., 500 kw. Mr. L. B. F. Raycroft, vice-president of the N.E.M.A. and head of its radio division, stated that this proposed rating means that, in the Association's opinion, the smallest power possible to give good service shall not be less than 0.5 kw., that stations designed for greater service shall then start in power at 5 kw., then 50, and then 500 kw. It is understood that the N.E.M.A. power recommendations advise the relative increase of power in all stations, whether small or large.

The electrical press announced at the end of last month that the merging of the Mackay Companies with the International Telephone and Telegraph Corporation as the "Postal Telegraph and Cable Corporation" has been completed. Mr. Clarence Mackay is chairman and Mr. Sosthenes Behn president, respectively, and it was expected that trading in the new corporation's $30,000,000 7% preferred stock and also the $52,000,000 5% gold bonds would begin last week.

During its annual meeting in Chicago in June the Radio Division of the National Electrical Manufacturers' Association favoured the increased use of higher power by broadcasting stations, and also recommended to the Secretary of Commerce that radio inspectors working under him be supplied with adequate apparatus for the accurate measurement of the carrier frequencies of broadcasting stations. During the last session of Congress, many voices were raised against the use of high power by broadcasting stations, the loudest of which was that of Mr. Ewin L. Davis, of Tennessee, who boldly announced that 10,000 watts was the largest power which should be permitted any broadcasting station, but the attitude of the Transmitter Section of the National Electrical Manufacturers' Association, expressed at its annual June meeting, is in direct opposition to that of Representative Davis and to all who sympathised with him.

On July 13, the Exchange Telegraph, New York, informed the London Press that technical experts comment favourably on a television experiment yesterday in which the movements of a tennis player in white flannels, on the top of a sky-scraper, were clearly visible on the screen several floors beneath

This is considered epoch-making, because it is the first time sunlight has been used instead of artificial illumination.

A camera-like televisor on the roof was connected with the screen of the receiving apparatus by wire, but it is claimed it would be just as successful if wireless were used. Doctors Herbert Ives and Frank Gray conducted the experiment.

Memo.—In the July issue of *Television*, published in London, Dr. J. A. Fleming, F.R.S., states very definitely that he has had the opportunity of seeing in practical operation in Mr. Baird's laboratory this same striking advance in television apparatus which makes daylight television something more than a possibility.

Mr. T. Thorne Baker, in *The Electrical Review* of July 20, gives a very clear, brief and unimpassioned "Review of the Present Stage of Development of Television" in this country and in the U.S.A.

Our telephone friends may be interested in a telephone attachment invented in the States which enables a number of regular calls to be made without passing through an exchange. The information regarding this device is somewhat meagre, but it is stated that the invention "is intended for the use of banks and other firms with branch offices." No further particulars are given, but one can imagine the possibilities of a selective dialling which, when calling a certain "extension" of a P.B.X., would pass any call thus dialled, direct through to the private room of a Manager, &c.

At the annual meeting of the Radio Division of the National Electrical Manufacturers' Association on June 6 at Chicago, it was announced that a sound plan for rating radio broadcasting stations on a merit basis would soon be released.

On the recommendation of its Technical Committee, the Council of the Union International de Radiophonie has adopted as the standard of expressing the power of broadcast radio-telephone transmitting plant that of the power, expressed in kilowatts, fed to the aerial when the carrier wave is unmodulated.

The wireless photogram service which has been conducted by the Marconi Company since May, 1926, for the transmission of photographs, drawings, signatures and facsimiles of all kinds by wireless between London and New York, has been extended so that photograms received in New York by wireless may be transmitted by wire on to other important commercial centres in the United States of America. A photogram sent from London by wireless addressed to these cities is transferred in New York to the telephone-wire picture service of the American Telegraph & Telephone Company. The cities included in the service are Boston, Cleveland, Atlanta, Chicago, St. Louis, Los Angeles, and San Francisco. It is thus now possible for an illustration of the day's happenings and facsimiles for business or engineering purposes to be received in the cities mentioned within a few hours of their being handed in at Marconi House, London.

It will be recalled that *The Electrical Review* recorded the opening of this service in its issue of June 4, 1926.

The following may be looked upon as correct up to about the end of January of the present year:—

"Outside the United States, the most powerful broadcasting stations are those at Motala (Sweden) and Moscow (Russia), having 40,000 watts each; Russia also has a 29,000-watt station at Moscow, and one of 10,000 watts at Leningrad. Daventry (England) operates on 16,000 watts. A station of power ranking above 40,000 watts is reported to be under construction in the Netherlands. The ownership of 34 broadcasting stations has not been reported; Governments own and operate 77 stations; associations and institutions, 87; commercial and industrial establishments, 69; broadcasting companies, 127; and private citizens, 33. Of the Government stations, two are municipal, 16 provincial, and 59 national, the latter being subdivided into 33 operated by ministries of communication, two by ministries of education, and four by ministries of war, the 20 stations in the United Kingdom being administered by an independent government broadcasting commission.

"Radio organisations operate 65 of the 87 stations in the organisation group; church organisations, 6; and educational institutions, 5. Aviation, political, military, radio merchants and theosophical societies operate the remainder. Merchants, mostly electrical and radio, have 35 stations, manufacturers maintaining 5. The stations operated by publishers number 15, most of them newspapers; by railways, 3; and grain dealers and farmers' co-operatives, 2 each; telephone companies, hotels, sales agents, theatres, and power companies are represented by a single station each.

"Radio amateurs account for the largest group, with 40 stations. Nation-wide chains include 29 stations, 21 of them being owned by companies holding national broadcasting monopolies. Local broadcasting companies each operating a single station number 31. Regional monopolies with exclusive broadcasting rights in only a limited part of the country own 27. Private citizens control 33; in a sense these are of the amateur class, though their stations are of the broadcasting classification. Fifteen broadcasters have part-time use of stations owned by other organisations. Four of these are church organisations, one a radio society, two are publishers, and one a railway, the latter having arrangements with eight stations in different cities.

"The fact that certain London papers have extended their news facilities by the adoption of means for telegraphing illustrations, &c., to and from the metropolis and some provincial centres, is indicative of the progress of photo-telegraphy, which may be achieved by wire and wireless means. Services are available to the public in America, between England and America, and on the Continent of Europe, the several systems in use being known as the Ranger-Marconi, Western Electric, Thorne-Baker, Belin, Bartlane, and Siemens-Karolus-Telefunken (Siemens-Schuckert (Great Britain), Ltd.). The two last-named are understood to be those used by the London Press.

"The most recent development of the system was demonstrated in the U.S.A. when the American Telephone & Telegraph Co. 'telephoned' a short kinematograph film from Chicago to New York, where it was developed and made completely ready for use in exactly one hour 35 minutes after the actress had posed for it in Chicago. The total length of the film was 10 ft.; it was cut into strips 6 in. long, three of which were transmitted at a time. The cost of transmission was $10 (£2) per foot." (The transmission of the film piece by piece is not to be confused with Television transmission.—Ed. *T. & T. Journal.*)

Personal and General.—As a result of the Associate Membership Examination of the I.E.E., held in May, 70 candidates passed or completed the whole examination; 18 passed Part I only and 7 Part II only.

The Council of the Institution made the following awards of Students' Premiums for papers read before the Students' Sections during the 1927-28 sessions: £10 each to Mr. J. T. Allan, B.Sc., for his paper on "The Education of the Engineer"; to Dr. R. C. Fox, for "The Three-electrode Carbon Arc"; to Mr. C. J. O. Garrard, on "Phase-Advancing"; to Mr. J. W. Gibson, B.Eng., for "Control Equipment for Direct-current Trains"; and to Mr. E. A. Loban, for "The Economical Transmission of Electric Power." £5 to Mr. L. Burdes, for "Electric Lifts," and to Mr. J. A. H. Lloyd, for "Carrier Telephone Systems."

The following is excerpted from the *C.T.O. Chronicle*, to which the writer would wish to add a personal tribute to the quiet heroism with which an old colleague struggled against the sad adversity of ill-health: "The many friends of the late Mr. C. A. Craighead will regret to learn of his passing away

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in April last at the age of 53. He was transferred from TS to the Controllers' Staff, C.T.O., in 1920. An illness in 1924 was followed by a further breakdown in 1926, and he was superannuated in 1927. He leaves a widow and two daughters, for whom much sympathy is felt."

While the pages of our last issue were issuing from the press, came also the sad sequel to my few lines of sympathy and hope on account of his retirement from the Cable Room owing to ill-health of Mr. R. H. Matthews, who only survived his pension date by a few weeks. They laid the tired body to rest in his "wee garden of remembrance," the peaceful little cemetery of old Amersham, and, as an esteemed colleague describes it, "the green corn waving round it, the lark singing overhead." A goodly company from the village followed, including Mr. Ratcliffe the community singer, and Messrs. S. R. Green, W. R. Jones, Lange and E. A. Ward representing the office. The floral tributes were numerous and beautiful, including one from the Cable Room.

The fable so persistently believed by many, including the captain of the *Homeric*, that "the increasing use of wireless communication is responsible for the increasing frequency of unusually violent storms on land and sea," should have received its *quietus* during the long spell of glorious sunshine in which our little island has basked—or gasped!

If not, then the article on the subject by the Royal Meteorological Society, which appeared in the *Radio Times*, must surely have buried that theory under the waves of oblivion.

The issue of the prospectus of "Baird International Television, Ltd Cap., £700,000. To test, exploit, exercise, develop, manufacture, improve, exhibit, work, let out on hire and generally turn to account and trade with inventions relating to a system of transmitting views, portraits and scenes by telegraphy or wireless telegraphy, and to adopt two agreements with Television, Ltd. Reg. office: 133, Long Acre, London, W.C.2" has not received an unqualified approval in all quarters. The financial side of these enterprises must naturally be calmly weighed and plain matter-of-fact reasoning and criticism applied to every scheme, however hopeful it may appear to the promoters. *The Electrical Review*, in its issue of June 29, however, went so far as to say: "In our opinion the art of television is not even in its infancy, but in the embryo stage, and not in a fit state to place before the public in its naked immaturity."

I have been asked "What do you think of the Merger?" Well, I think a good many things concerning it but, not being better informed than the ordinary public, there would be no justification for the expression of any personal opinion of so insignificant a person as the writer. All I can do is to place before readers one or two press cuttings which may show how the matter is being viewed from various points, thus:—

This from the *Melbourne Age*, and according to the Exchange agency: "It seems incredible that a valuable and indispensable monopoly should pass out of the Government control. It is imperative that cables and wireless should be combined, but it is much more imperative that they should be directly and absolutely controlled by the Government.

"If the Federal Government proposes a different answer it is guilty of the gross betrayal of the Australian people."

The Montreal correspondent of the *Daily News* cables: "It is feared that the union of British Marconi and Eastern Cables will cut out messages to and from Australasia now carried by the Pacific Cable, in which Canada is a partner.

"The view is expressed that the merger and the proposal to leave the Pacific Cable for ten years would result in leaving it without business or connections. It is considered doubtful that Canada will agree to any merger scheme."

Reuter's Ottawa agency states that: "The Government is seeking to preserve Canada's investment in the Transpacific Imperial Cable and to impose safeguarding conditions in respect of rates and other matters."

Then there is the special correspondent of the *Times Engineering Supplement*, who only a few weeks ago wrote, among other things, as follows: "No one at the present moment is going to object to mergers *per se*. Administrative and other economies are undoubtedly possible from combination in respect of international communications as in respect of other combinations. But there are peculiar features in connexion with international communications which may possibly counterbalance some of the good which a combination would achieve. For example, the wireless rate to South Africa at the present moment is 4*d*. per word lower than the cable rate, and we need not be surprised at the fact that the cable companies declare that they have lost a considerable amount of traffic. That this traffic is economic from the wireless point of view is proved by the fact that the South African Wireless Company has declared a dividend of 20%. The deduction which the plain man would make from this is that further research and development with wireless communications would probably lower the rate still further, to the great advantage of industry, so that if a merger is to take place the public will need to be guaranteed not only that the wireless rates will not be raised in order to protect the cables but that it may get the benefit of still further reductions as science may make them possible."

Then, during the sitting of the Imperial Wireless and Cable Conference, the Empire Press Union, in a memorandum to that body, stated that: "The Empire Press Union has no preference for any particular system of telegraphy, but it is evident that the improvements that have lately occurred in long-distance telegraphy are entirely due to wireless. Before the threat of wireless competition the cables showed practically no sign of development."

Again, there is the declaration by Sir Robert Donald, Chairman of the Imperial Wireless Telegraphy Committee, who, in writing to the *Daily Mail*, declared that: "The beam stations and the cables will remain the property of the State and no one will contend that they will not be more efficiently managed and that progress will be greater when they form part of one huge all-Empire organisation under the direction of first-class business men. The Dominions, especially Australia, have never taken to operation by the Post Office and will welcome the transfer. Under the proposed scheme no branch of Empire Communications will be under State operation."

To round off this symposium, let me terminate by quoting from the financial section of the *Daily Telegraph* of only but a few days before this journal goes to press, which lifted the warning finger thus: "That an agreement has already been come to, as was alleged in some quarters, is obviously incorrect, since it must await the report of the Imperial Conference, which is not expected to be received for several weeks. A satisfactory settlement eventually is more than probable, but there are many delicate matters to be adjusted which have nothing to do with the terms of the proposed merger published last March."

And there, as the popular novelist says, we will for the present leave them!

Writing.—It is the greatest invention man has ever made, this of marking-down the unseen thought that is in him by written characters. It is a kind of second speech almost as miraculous as the first.—*Carlyle.*

J. J. T.

THE POSTMASTER-GENERAL ON BROADCASTING.

IN his speech on the Post Office Estimates, Sir William Mitchell-Thomson said:—

Let me now deal with one or two rather more detailed matters. I come first of all to a form of activity for which the Post Office has only a vicarious responsibility—broadcasting. The first report of the British Broadcasting Corporation was presented to me a short time ago. I at once laid it on the Table of the House and it is now available to Members in the Vote Office. On the whole I think it can be said, and said fairly, that the institution of the British Broadcasting Corporation, which was an entirely new experiment—I confess that I recommended it to the House with a little trepidation—has justified itself. On the whole it can be said that we have established broadcasting in this country on a foundation which is not merely firm, but which is the envy of many other countries. I told the House of Commons when the Corporation was being set up, the general lines upon which it was proposed to proceed, and I have followed those lines very closely. That is to say that in the ordinary matters of detail and of day-to-day working, the governors are absolutely masters in their own house. I do not interfere and do not seek to interfere with their absolute freedom in those respects and I hasten to say that, because I observe a certain amount of controversy in sections of the Press about the character of the programmes that are being broadcast. If any hon. Member of the Committee, therefore, is desirous of making remarks on the character of the programmes, all I have to say is that I shall faithfully see that what he says is conveyed to the British Broadcasting Corporation and the governors thereof; but as I told the House of Commons at the time when the Corporation was set up I firmly refuse to have any responsibility whatever myself for these details.

As regards matters of general policy, for which I am prepared to take a certain measure of responsibility—because, of course, we must retain a measure of control over larger matters of general policy—the most important, probably, is the new regional scheme. After considerable experiments at Daventry, attended with a good many difficulties, but on the whole successful, the British Broadcasting Corporation made up their mind that they would like to embark upon a regional scheme of large twin stations. They applied accordingly last February for authority to begin this system by erecting a high-power station at Brookman's Park, near Potters Bar, in substitution for 2 LO. After going into the matter with them I have authorised them to proceed with the erection of the station, and it is expected that it will be completed some time next summer. In the first instance, single wave working only will be adopted from that station until it is seen by further experimental tests whether reception from a twin station is generally practicable. On June 14, the Corporation applied for general permission to proceed with the preliminary steps—that is to say, the search for sites and the consideration of technical details—for twin wave, high-power stations at Manchester, Glasgow and Cardiff, and for a single wave, high-power station at Belfast. That application is having consideration at present, and I anticipate I shall be in a position to give permission almost at once, and the search for the actual sites will then have to begin.

As regards Empire broadcasting, I authorised the British Broadcasting Corporation to conduct experiments in short wave broadcasting for the outlying parts of the British Empire, and these experiments are still in progress. The Committee may be interested to hear some of the figures about licences. The total number of wireless receiving licences in force on June 30 last was approximately as follows: Paid licences, 2,506,300; free licences for the blind, 12,722; total, 2,519,072. The number in force on the corresponding date of last year was 2,307,678, showing an increase during the 12 months of 211,394, or over 9%. It may further be of interest to note that the number of licences per 1,000 of the population is regionally distributed as follows: England and Wales, 59; Scotland, 37; and Northern Ireland, 21. The receipts from the licences were divided in the following proportion. The total receipts, as the Committee may be aware, were £1,253,150, and, of that, £898,804 goes to the British Broadcasting Corporation, while the 12½% to the Post Office for cost of collection is £156,644, and the balance retained by the Exchequer is £197,702.

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PROGRESS OF THE TELEPHONE SYSTEM.

THE total number of telephone stations working at May 31, 1928, was 1,651,240, representing an increase of 12,673 in the total at the end of the previous month.

The growth for the month is summarised below :—

	London.	*Provinces.*
Telephone Stations—		
Total at May 31	585,704	1,065,536
Net increase for month	4,532	8,141
Residence Rate Subscribers—		
Total	135,783	215,789
Net increase	1,333	2,372
Call Office Stations (including Kiosks)—		
Total	5,277	19,096
Net increase	32	137
Kiosks—		
Total	959	4,026
Net increase	32	113
Rural Party Line Stations—		
Total	—	10,231
Net increase	—	38
Rural Railway Stations connected with Exchange System—		
Total	—	918
Net increase	—	9

The total number of inland trunk calls dealt with during the year 1927-28 was 102,206,596, or roughly 7½ millions (8%) more than in the previous year.

A comparison of the inland trunk statistics for the years 1926-27 and 1927-28 is shown below :—

	1926-27.	1927-28.	*Increase.*	%
No. of Trunk Calls	94,661,136	102,206,596	7,545,460	8.0%
No. of Exchange Lines (mean for year)	920,207	1,000,940	80,733	8.8%
Average No. of Trunk Calls made per Exchange Line ...	103	102	—	—
No. of Trunk Circuits at end of year	13,955	14,867	912	6.5%
Average No. of Trunk Calls made per working day ...	306,347 (309 working days)	329,168 (310½ working days)	22,821	7.4%

During the year 1927-28 the Continental telephone service was extended to eight more European countries, and at March 31, 1928, telephonic communication was available between Great Britain and 13 European countries as compared with five a year previously. The transatlantic service, inaugurated on Jan. 6, 1927, for service between Great Britain and the U.S.A., and (later) Cuba, was extended to Canada in October 1927.

The total number of outgoing Continental calls made during the year 1927-28 was 338,377, and incoming Continental calls 360,946, representing increases of 55,256 (19.5%) and 46,753 (14.9%) respectively, over the totals for the previous year.

In the last three months of the year 1927-28 the transatlantic telephone service was extended to certain European countries, viz : in January to Holland and Belgium, in the following month to Germany and Sweden, and in March to France (Paris) ; all calls between America and the Continent of Europe pass over the radio-telephone link between New York and London, and are switched in the London Trunk Exchange on to the Anglo-Continental telephone cables.

Further progress was made during the month of June with the development of the local exchange system.

The more important exchanges extended included the following :—

LONDON—Sutton, Hatch End, Malden.

PROVINCES—Aylesbury, Bramhall, Cambridge, Cosham (automatic), Cowes, Fleet, Fort William, Hayling Island (automatic), Idle, Low Moor, Tipton, York (automatic).

During the month the following addition to the main underground system was completed and brought into use :—

Canterbury—Dover—Folkestone cable,

while 68 new overhead trunk circuits were completed, and 78 additional circuits were provided by means of spare wires in underground cables.

TELEPHONE DEVELOPMENT STUDIES.

BY E. ERRINGTON (*Field Officer*).

IT is of great interest to read the views expressed in the May issue by one who, to the great majority of Field Officers, is only known by the initials H. J. M. Mr. Maclure has covered the ground regarding development studies, pointing out some of the difficulties and problems which surround various schemes submitted to Headquarters.

It has occurred to me that there may be other little items of interest especially from the temperamental point of view of the man who has to go out and do the job, namely the Field Officer.

Visualise an officer, armed and equipped with the maps, C.M.1004, and classification schedule (not forgetting his personal luggage if a stay has to be made) landing at a strange station some cold foggy morning, with the idea of worming out all the secrets in the universe regarding the area bounded by the thick white line, plus a vital consideration, the effect on adjacent areas. His maps will show him that High Street runs up and down this way, the river winds in a certain direction, that certain railways run from point to point, but apart from this, it is left to the Officer's discretion and experience as to how he intends to tackle this probably roaring hive of industry in the best possible manner, to finish up with a complete and comprehensive scheme supported by chapter and verse, to give a conviction that the study has been done properly. It is all very well to say "I have done it—Go thou and do likewise," but one must be suited temperamentally to the work if he is to be successful in the collection of relevant data and information. It is he who has to issue forth and slay the "dragon in his lair," viz., the council authorities, the surveyors, the land agents, the employers of labour and other gentlemen quoted in the Instructions, who are (always) so obliging and willing to give a stranger the benefit of their ideas. What joy if he is successful in obtaining a copy of a building lay-out and emerge with it tucked away in the inside pocket for safety.

Well, I must say that it required certain gifts of tact, &c.

Then, the great question of what to believe and what not to believe. One authority states that the canal will be filled in and made into a main road. This would mean the development of various sites into huge business establishments, &c., and probably alter the outlook for some number of miles. What effect will this have on an area where only few telephones exist ?

Another authority states : "No, it will never happen in our time." Perhaps the speaker is about three score years and ten—you are about thirty. "Silence is golden," and to conform with the proverb would be the safest course, I presume.

The question of how far, and at what period, road traffic will successfully compete with the railroad, opening up for development portions of the country not yet touched ?

If a village is some miles from the exchange building, will it develop to any extent from a country residential point of view ? If so, at what period will a rural exchange mature ?

Then again, as the development of areas is one of finance, a good Field Officer must possess the brains and foresight of a "real estate agent" and financier rolled into one, optimistic and imaginative when necessary, to be able to visualise streets and streets of houses, factories and works, &c., where at present only grass "whispers in the wind." But it is these little difficulties that make the work of interest, and give zest to the game of "Approved or Not Approved."

The question of a school for Field Officers is of considerable interest, notwithstanding that the majority of districts have passed, or are passing through a "Correspondence course" with headquarters on development studies.

We know, of course, how some officers can be optimistic on a wet day, and others cannot be, even on a fine day.

A training centre would probably obviate difficulties now encountered, assist in co-ordinating ideas, and in the end justify the means.

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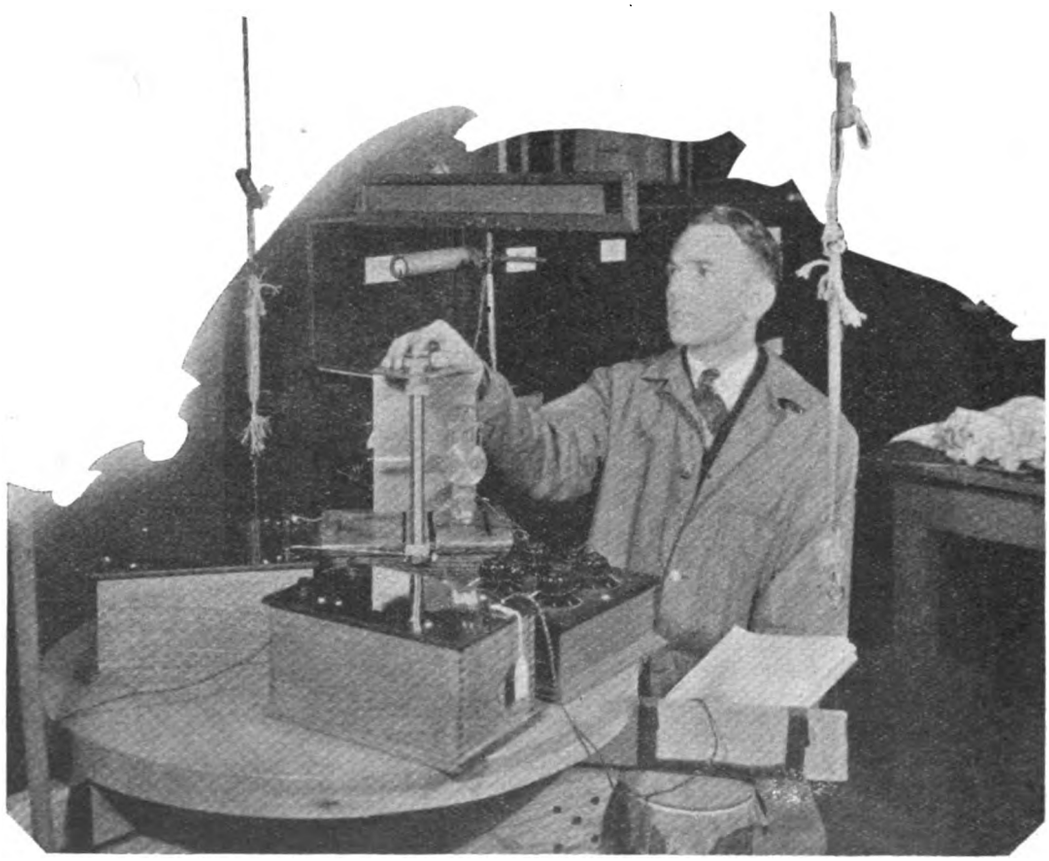

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The
Telegraph and Telephone Journal.

PUBLISHED MONTHLY IN THE INTERESTS OF THE TELEGRAPH AND TELEPHONE SERVICE, UNDER THE PATRONAGE OF THE POSTMASTER-GENERAL.

Editing and Organising Committee - - - J. STUART JONES. W. D. SHARP. J. F. STIRLING. W. A. VALENTINE. J. W. WISSENDEN.

Managing Editor - - - W. H. GUNSTON.

NOTICES.

As the object of the JOURNAL *is the interchange of information on all subjects affecting the Telegraph and Telephone Service, the Managing Editor will be glad to consider contributions, and all communications together with photographs, diagrams, or other illustrations, should be addressed to him at the G.P.O. North, London, E.C.*1. *The Managing Editor will not be responsible for any manuscripts which he finds himself unable to use, but he will take the utmost care to return such manuscripts as promptly as possible. Photographs illustrating accepted articles will be returned if desired.*

VOL. XIV. AUGUST, 1928. No. 161.

TELEGRAPH AND TELEPHONE WORKING AND ITS CRITICS.

THE annual statistics issued for 1926 by the Telegraphic Union, Berne, will afford a certain cold comfort to telegraph men in that they show that the annual shrinkage in the number of inland telegrams handled is not confined to Great Britain but is even more pronounced in other countries belonging to the Union. On the other hand, as in previous years, the volume of international telegraphic correspondence continues to increase. In Japan, the heaviest users of the telegraph, the inland telegrams declined from 67.7 million in 1925 to 65.9; in Great Britain from 49.8 million to 47.4; in France from 40.1 million to 34.4; in Germany from 32.8 to 28.9; in Russia from 29.3 to 28.5; whilst in the Argentine and Italy there were increases from 32.4 to 32.9 and 26.8 to 28.3 respectively. The international traffic rose in Great Britain, where it is highest, from 27.4 million to 27.8, in Germany from 17.4 to 18.3, in Japan from 2.4 to 2.5 million, whilst in France and Italy it suffered a small decline to 14.3 million and 7.2 million respectively. The ratio of international to internal telegraph traffic in this country increases every year, and it may be said that in this branch of the service at least, the yearly progress is solid and satisfactory. In 1922 the proportion of international and inland telegrams in this country was 23 to 55 millions—now it is 27 to 49. Germany also shows an increase from a proportion of 14 to 51 to a proportion 17 to 32.

Much warmer comfort will be obtained from the Postmaster-General's speech on the Post Office estimates, which we reprint elsewhere, where he states that our best service compares very favourably with the best American practice, and with the German "lightning" service, and that it is certainly up to that in any other country in the world as regards average normal speed of operations. He also has a good deal to say as to the fallacious deductions of critics with regard to the economic result of the combined working of telegraphs and telephones.

In fact the critic of Government services seems always to be in two minds. In the first he expects the Government, pursuing commercial ideals with ardour and enterprise, to make a handsome profit out of its undertaking; in the second, he expects the services to be placed, regardless of cost, within the reach of the most inaccessible and sparsely populated districts in order to safeguard the inhabitants from fire, flood, pestilence, or sudden death without medical aid. Sometimes he vaguely suggests that the vast profits which a commercially inspired Administration ought to earn should cover the loss on the compassionate services to be provided in the villages—in other words, that the townsman should be charged at a rate which is, in effect, bearing part of the cost of the villagers' service.

To a limited extent some loss is incurred in providing rural call offices, and to a greater extent in maintaining a telegraph service to all (including the remotest) parts of the country. As the Postmaster-General said in the speech referred to, the view of practically every Government in Europe is that an efficient telegraph service confers such benefits on the citizen in general that it is worth running even at a loss. This, it need hardly be said, is not and could not be the view of a commercial company. But there is no end to the confused thinking which exists upon this subject. The writer of an editorial in a recent issue of an East Anglian daily paper dealing with the telephone service is moved to scorn at the mere idea of asking for guarantees. Does a motor-bus company ask for a guarantee before it opens a new 'bus route? he asks. As if there were any comparison between the capital cost of running omnibuses over a route thoughtfully provided by the ratepayers for the omnibus company, and the cost of building 4 or 5 miles of pole route and of maintaining an exchange in operation! If a 'bus route does not pay it can be, and frequently is, discontinued, and the omnibuses are employed on another itinerary; but you cannot "scrap" an exchange and pole route without an enormous loss of capital. Again, we are asked if railway companies require a guarantee before they open a station. We believe that builders developing an estate have sometimes contributed to the cost of providing a railway station, but whether this be so or not, we do know that small villages of a few hundred inhabitants may be observed by the traveller nestling against any main line of railway—villages which have remained without a railway station since the 'fifties of last century, and whose inhabitants still walk or send their goods to the nearest station 4 miles distant. Many a fair-sized market town lies a mile and a half or 2 miles from the station named after it. No spur line is ever thrown out in its direction; but whether a guarantee is ever offered or refused in these cases, we do not know. We only know that a State undertaking has responsibilities which a commercial company has not, and that if it does good by stealth in the way of assisting the (commercially) unattractive hamlet, it has ultimately to blush to find itself famous for failing to make sufficient profit.

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OUR PRIZE COMPETITION.

A FAIRLY gratifying response from our male readers has been received to the offer of the Editing Committee in the April issue to award prizes to the writers of the best papers on the subject of "Eliminating the Waste." The contribution of our women colleagues to the competition, however, has been so scanty that the Editing Committee are unable to find a paper of such outstanding merit as to deserve the second prize.

The prize-winners are :—

1st (Men).—Mr. F. J. Lane, District Manager's Office, Reading.

1st (Women).—Miss M. J. Clement, "Royal" Exchange, London Telephone Service.

2nd (Men).—Mr. H. B. Carroll, Traffic Section, Telephones, Liverpool.

Cheques have accordingly been sent to them and their papers are published in this issue.

Some of the papers submitted were rather outside the scope of the subject or touched on administrative questions which are outside our province. Others contained useful suggestions more suitable for submission to the official Awards Committee. We shall print some of the more valuable unsuccessful papers in subsequent issues.

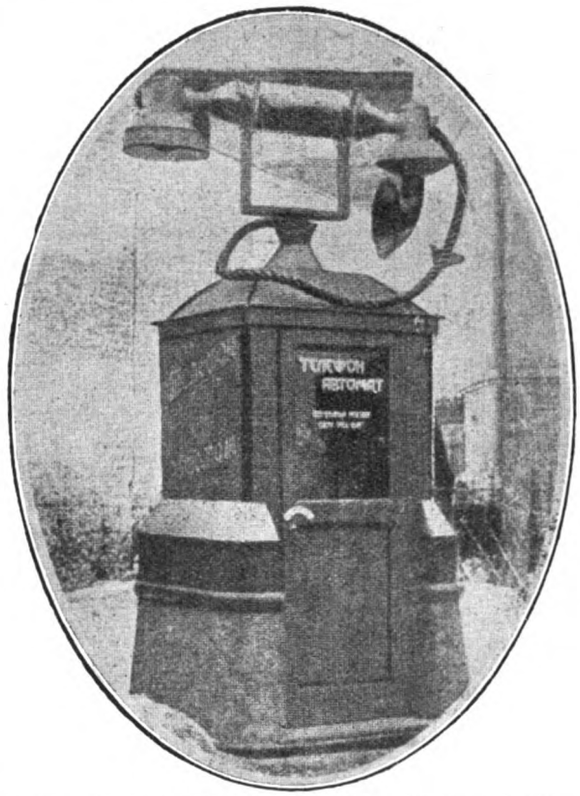
HIC ET UBIQUE.

WE learn from the *Blue Bell*, Montreal, that the first link in a Trans-Canadian trunk telephone circuit was completed last month, when the section between Sudbury (Ontario) and Fort William was bridged. Sudbury is already in direct connexion with Toronto, Montreal, and Quebec, and Fort William with Winnipeg (Manitoba). There is thus now a direct high-grade circuit between Eastern Canada and Winnipeg, to which city traffic has hitherto been circuitously routed via the United States. Extensions westward to Saskatchewan are planned, and when the British Columbia—Alberta line, now under construction, is completed, direct circuits between Winnipeg and Vancouver will be available. Much will yet have to be done in building up a complicated network of repeaters and other aids to good transmission before East and West will be able to talk, but the completion of the scheme will ultimately realise the dream of a Trans-Canadian telephone line.

Trunk telephone service between Palestine and Egypt has been extended to all places in Palestine and to Amman in Transjordania. We have before us a mimeographed trilingual circular in English, Hebrew, and Arabic, announcing the good news. "Talafouniat-al-aksshanj" (exchange telephones) seems a far remove from the "Arabian Nights."

We notice that twice recently in the Coventry district, thieves took advantage of the telephone to lure a maidservant away from a house with the story that her mistress had met with an accident and required her immediate aid. When the house was thus left vacant, they proceeded to rob it. Cases of this sort are sometimes used by shortsighted people as arguments against having a telephone in the house. We should have thought that the ruse was now so old-established and well known that a maid receiving such a call would know that the proper course is to communicate at once with the police. But ruses like this, we suppose, are like old stories, there is always someone who has not heard of them. When a raconteur steps on the platform to indulge an audience with a "few little stories," it will generally be found that to about half his hearers the venerable tales have the bloom of freshness. At least, so the resultant laughter would seem to testify.

A correspondent in the *Manchester Guardian* gently chides the compiler of the Telephone Directory for instructing us to say "S for Sally, T for Tommy, and X for Xmas." Does anybody, he asks, really say Exmas ? We do not know, but our critic will grant that it is hard to find a well-known word beginning with X. Xenophon and Xerxes, though known to the educated, are caviare to the general, and we imagine that there may be many telephone users who are doubtful of the spelling of "xylophone," "xyster," and "xebec." "Xmas" serves its purpose, although many who are familiar with the abbreviation are not aware that the "X" represents the Greek chi. Hence the dreadful "howler" we once saw in an American paper where "Xtal" was made to represent "Crystal." Did the perpetrator imagine that the word was spelt "christal" ?



The above is a picture of a telephone kiosk of highly original design in a Moscow street. We can imagine the three simpletons of the Arabian fable encountering it and exclaiming: "Verily, how mighty of stature were the men of old, who used telephones of such size!" We are indebted for it to the Brazilian paper, *Sino Azul*. Telephone information is sometimes secured by roundabout ways. Not long ago we saw in an Italian electrical journal a paragraph purporting to be translated from a German paper, which in its turn proved to be a translation of a paragraph on page 249 of last September's *Telegraph and Telephone Journal*.

Representatives of the Soviet Postal Administration, says *The Electrical Review*, have left for Reval to negotiate with the Estonian Ministry of Communications with a view to establishing a telephone service between Russia and Germany via Reval and Riga.

We regret that pressure on space compels us to hold over a further instalment of Mr. Sellars' "Chronology of Telegraphs, &c." and several personal paragraphs.

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RECOVERING THE WASTE.

(Prize Paper.)

BY F. J. LANE, *District Manager's Office, Reading.*

MR. F. J. LANE.

THE outlook of most customers of a public service is that they pay the piper and are entitled to call the tune. Generally, there is little to complain of in this attitude, but in telephone service the customer is called upon to do a little more than call and pay if the service is to remain efficient. Nevertheless, the fact that the subscriber does pay, does confer on him the right to demand the highest efficiency from the administration before he will exert himself in the necessary co-operative effort.

For this reason it is thought desirable, not to make first a list of the causes of waste in order of importance, irrespective of which party is guilty, but to split them into two sections: those for which the administration is mainly responsible, and those which are particularly under the subscribers' control. Broadly speaking, they are divided as follow:—

The Administration.	*The Subscriber.*
Junctions engaged.	Number engaged.
Cut-offs.	Failure to answer, and delay in answering.
Delay in clearing.	
Wrong connexion.	Inexpert attention to calls.
Apparatus out of order.	Careless making of calls.

Since it is admitted that those who live in glass houses should refrain from throwing stones, it will be as well to take the failings of the administration first, and, of these, "junction engaged" is, perhaps, the most serious and, one might say, the least excusable. The problem, however, of providing adequate inter-exchange facilities (paying due regard to reasonable economy) is one of considerable magnitude. There is not a specific solution for it and, in fact, perfection is not at all possible.

The tendency at present is to connect groups of small exchanges with the main exchange to which they are presumed to be satellites. Generally, this form of concentration appears to work well and with economy, but it would be dangerous to make a fetish of it. I have in mind a case of a main exchange to the west of which are three smaller ones, more or less equidistant from one another, the farthest being about thirteen miles from the main centre. The first is near enough to the large town to be almost a constituent part of it, socially and in every other way. The other two are, to a much greater extent, communities apart from the town, but similar socially to one another. It is clear that the junction calls to the main exchange in the first case are likely to form a higher percentage of the total calls than is the case with the other two, which, however, would require intercommunication one with the other. All that appears fairly obvious, as indeed it is, but it serves to show the necessity of studying local conditions and opinions seriously, and not adhering too closely to a mechanical system. This study, in fact, is a process which has to be maintained in the effort to reduce to a minimum wastage by junction delays. Providing short-distance junctions between exchanges for the purpose of "borrowing" trunks is theoretically unsound, but may be of value in cases of exchanges afflicted with seasonal traffic peaks (a term which I hope is self explanatory).

Cut-offs, wrong connexions, delays in answering, and clearing, so far as the administration is at fault, can with advantage be taken together. Bluntly put, they are often due to carelessness, however excusable, on the part of the operating staff. The cause of a cut-off always appears to be wrapped in mystery, but it is feared that the simple explanation frequently lies in the universal instinct of self-preservation common to all telephone users, professional and otherwise. For example, in times of great pressure, the wrong plug is freed from the "tangle" and the defaulter, faced (telephonically) with the irate subscriber, is tempted sorely to blame another of the units in the long chain of communication—and she falls. What is the remedy? It must be confessed that there is no immediate one ready to hand. The progress made in the conversion of exchanges from magneto working to common battery working helps considerably along the road, as the more modern apparatus, with automatic signalling, reduces considerably the chances of error (excluding gross negligence) in the matter of cut-offs and clearing delays. In the case of magneto working the fault is largely the subscriber's. Called upon to do too much, he fails to do it. In the meantime, and in fact for all time, we must depend on efficient service inspection and maintenance for detecting and correcting the culprits, human and mechanical.

Another possible reason for wrong connexions is the similarity of exchange names accentuated by the enormous increase in number since the inception of the rural exchange scheme. Phonetic similarity of numbers is an affliction which we must bear with, but there is a certain amount of elasticity permissible in the naming of exchanges. Need we adhere too closely to the actual name of the village however awkward sounding its name, seeing that, after all, the exchange name is little more than an index to the number!

A further point which is also worth attention is the discouragement of subscribers from giving the number carelessly. In some small exchanges subscribers, familiar with the operator, frequently give numbers without prefixing (or affixing) the name of the exchange. The telephonist understands and, locally, all is well, but the subscriber is unnecessarily infected with the germ of carelessness. Gentle correction is really a useful weapon much employed. I have observed in London, that a subscriber gives a number: "Regent, three, double-nine, six," and the inflexion (without offence) in the telephonist's voice in the check, "Regent, three-nine, nine-six, is more effective than pages of printed instructions.

Finally, regarding wrong connexions, it is suggested that close investigation might be made of a number of cases with a view to discovering how far this form of delay is due to carelessness, defect in apparatus or other causes. The information, admittedly difficult to obtain, would be of incalculable value in applying correctives.

Turning to wastage for which the subscriber is wholly or mainly at fault, it is flattering to say that it forms the greater part of telephonic delay, but disheartening in the fact that treatment must of necessity be indirect, and therefore less effective.

"Number engaged" heads this list beyond argument, but to such an extent do other causes impinge on it, that it is thought as well to deal with the others first.

Excluding cases where attention to the telephone is impossible (business premises closed, &c.), delay or failure to answer calls may be caused by pure dilatoriness on the subscriber's part, for which education is the only remedy, or rather, device to mitigate the evil. There are, however, other reasons to which more positive correction may be applied. The position of the instrument bell sometimes has an important bearing on such delay, more particularly in the case of magneto table sets with partly enclosed bells which are comparatively feeble. In dealing with new subscribers, contract officers and fitters might suggest suitable positions (or draw attention to the disadvantages of unsuitable ones) and if necessary point out the advisability of renting an extension bell (obviously, service inspectors can similarly advise in cases of existing installations).

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Generally speaking, in small houses connected to magneto exchanges, the wall instrument (with its externally mounted bell) fitted in the hall is most likely to command attention.

Inexpert attention to calls is a fault which is only amenable to educative effort. Frequently it is found that the actual subscriber is perfectly competent, and the fault lies with his or her domestic or office staff. A gross case can be cited of a caller being cut off through a servant replacing the receiver when going to call her employer! Office boys fresh from school are often deputed to answer the telephone, and anyone with imagination can sympathise with them when first faced with this fearsome (and strange!) instrument. It is a pity that though, in the final stages of his education, a boy is familiarised with the higher branches of commerce, he is left in ignorance of how to use so common an essential of office equipment as a telephone. Perhaps the Board of Education may assist us.

Careless making of calls has been referred to before with the suggestion that telephonists could help with tactful correction. Printed advice supplements the direct influence of operators, but, admittedly, it is not very encouraging to observe that after years of instruction and actual requests, tradesmen's vans are seen in thousands bearing the telephone number followed by the exchange name.

Coming finally to the "number engaged" bugbear it is easily seen that practically all other forms of delay by whomsoever caused tend to increase the number of "engaged" reports. It is clear that so long as a call is ineffective or delayed, one number at least is engaged unnecessarily—therefore any successful efforts to reduce delay will react favourably to diminish this crowning evil. Apart from such hopes, however, there is a sovereign remedy in the provision of auxiliary junctions—if every subscriber could be induced to double his exchange line facilities "number engaged" would be a thing of the past, and certain other evils would lose some of their force. Such a telephonic paradise is, of course, outside the range of practical politics, but the fact remains that we have a specific cure to utilise to the greatest possible degree.

At present a certain reduction in rental is made for additional lines, but still the contract officer has to make out a fairly good case before the subscriber considers the proposition sufficiently attractive. It is boldly suggested, therefore, that the difference in rental between the first and auxiliary lines be made greater. It is admitted that from the point of view of maintenance economy the scheme is unsound, but it must be borne in mind that the recovery of such enormous waste would make a handsome compensation (even in actual revenue) for the apparent loss.

It is observed from the foregoing remarks that educating the public forms an essential part in the campaign to recover waste, and from the fact that hints and instructions have for years appeared in directories, it is obvious that something else is required. It is proposed, therefore, that suggestions might be regularly sent out with quarterly accounts where they would command more attention. It is not suggested that a parcel should be posted on each occasion, but that different leaflets should be dispatched at various times. This has been tried with advertisements for extensions, and on several occasions it was noticed that subscribers were previously unacquainted with the rental of such facilities, although paragraphs describing them have appeared in directories!

Adequate service inspection is of paramount importance and, what is more, so is a high degree of competence of the inspectors. The mere collection of facts for the Traffic Superintendent's attention is likely to lead to the magnification of minor points and the overlooking of serious defects. The efficiency (and indeed, the magnitude) of a telephone service is governed largely by the Traffic Department, for poor quality must eventually mean reduction of quantity.

In conclusion, it must be said that the essential co-operation of the subscriber can only be secured by letting him see that the administration is human, and to rid his mind of the feeling that it is but a complicated robot from which nothing can be expected but quarterly accounts.

RECOVERING THE WASTE.

(Prize Paper.)

BY MARGARET J. CLEMENT, *Royal Telephone Exchange, London.*

IT is to Samuel Smiles that we are indebted for the following:—

> "Accumulations of knowledge and experience of the most valuable kind are the result of little bits of knowledge and experience carefully treasured up."

The Editor of the *Journal* places this same view before us, when in reviewing the subject of Waste he writes, ". . . it is very desirable to pool experience from all parts of the country, or to obtain fresh suggestions from those in actual touch with the subject." It is from the viewpoint of a busy London exchange that the "little bits" of the writer are presented, possibly no other branch of the Service offering such a field for exploration.

In an attempt to gather in the wastage of Lost Calls, Mr. Johnson sets before us a possible standard of 90% of calls effective on the first application, and if we are to achieve this it seems that we should first of all investigate each class of call individually, analysing every operation that takes place.

Space, however, prevents this, so what are known as "wrong connexions" will be delved into first.

A "wrong connexion" is a call which, so to speak, goes astray. It can wander from its path for various reasons, but in every case, unless the number required is connected by the monitor—normally an out-of-order procedure—the call proves abortive, and has to return home again and start on its journey afresh. At a few exchanges special positions for dealing with these calls are fitted, but this again is a wasteful procedure, and there is a distinct loophole for error in the fact that when the call travels to these positions via the information desk, no busy-back flash is received at the originating exchange. Why then do these calls go astray? For the subscriber plays no part in the error, it being an A telephonist who directs the call on its journey over the order wire and a B telephonist who meets it half way.

The reasons surely are:—

(1) A telephonist picks up the wrong junction.

(2) A telephonist picks up a junction on the wrong exchange.

(3) B telephonist allots a junction, but for some reason forgets the number required.

(4) B telephonist understands a peg number to be asked for when number is O.K.

In all four cases an error has occurred in the exchange which causes the B telephonist in the case of (1), (2), and (3) to receive a signal from which she gains no knowledge of what is required. At this stage the call is literally hanging in mid air. The B telephonist being unable to make a connexion, passes the work of finding out what is wanted on to the monitor. This officer duly finds out the number required, and then, much to the annoyance of the subscriber, she does nothing more or less than refer the call back to its base by flashing the distant telephonist into circuit and advising her to ask again, the flashing procedure taking on an average 30 seconds. So ends the journey of a really lost call.

That the wrong connexion trouble is a very real one is proved by the fact that at some of the most important exchanges in London, 40% or more of the work performed by formal desk officers is in this connexion. What a saving of temper, time, and money could be effected here!

The reasons already given will now be dealt with in the order referred to above.

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(1) *A Telephonist Picks up Wrong Junction.*

Not many wrong jacks are picked up—that is to say, a telephonist does not often pick up, for example, a junction in the strip above or below the correct one—but a large number of wrong junctions are picked up by reason of the fact that A telephonists accept from B telephonists junctions on which the articulation is doubtful.

The junction is accepted on chance.

If it is a wrong one and the junction is clear, it is picked up and a wrong connexion is the result.

If the junction happens to be engaged it prevents it being picked up, but how often does a supervisor see another junction of phonetic similarity tested and picked up in its place ?

Obviously, in the mind of the telephonist there must have been doubt in the first place, and the proof that it is a common irregularity appears in the " wrong connexion " traffic. If this is not the case it points either to the fact that telephonists' hearing as a whole is not good, or that they are working with defective instruments.

The weekly test of all instruments cuts out the latter reason, and as regards the former there is no substance in it, telephonists' hearing in general being particularly keen.

What, then, is the reason that a telephonist with keen hearing and a good instrument picks up a wrong junction ?

It surely comes down to two reasons :—

(1) Lack of concentration in accepting a junction.

(2) Accepting one of doubtful accuracy.

It is with the latter that the writer would deal.

The law of the land states that the receiver of stolen property is as bad as the thief (or is it, worse ?), and in order-wire working the acceptor of a badly articulated junction is surely as bad as the giver of it.

This point is of major importance in operating, for unless the call is built up on the foundation of a correct junction it must fall to the ground again.

The same principle is at the very root of the wrong number trouble, for if the B telephonist accepts faulty articulation from the A telephonist, the balance of responsibility for any error surely lies with the acceptor ?

The following may be a little aside from the actual subject of wrong connexions, although wrong connexions and wrong numbers are closely allied, but how often does an error such as this come under notice—8022 required, 0222 connected.

The phonetic similarity between 8 and 0 and 0 and 2 is not great, but when used collectively, as in the numbers quoted, and articulated badly, the numbers are of similar sound.

It may be that in this we reach the very root of the wrong number trouble, the acceptation of collective sound in place of well ordered digits.

Whether this is so or not, the fundamental importance of deliberate articulation cannot be too strongly emphasised, and by its consistent application much wastage could be retrieved.

Let us have a campaign then against " wrong junctions " or " wrong numbers " being picked up, and let more mention of articulation on order wires play its part in the scheme.

Before leaving the subject of wrong junctions being picked up it is suggested in the case of multiple order wire groups, that as an aid to telephonists in knowing which junctions work on each individual order wire, the outgoing junction field should be suitably bracketed.

To junior staff this knowledge should prove helpful, and would prevent, for instance, a junction being picked up on the second order wire when application was known to have been made on the first. Perhaps heavier marking of the 5th, 10th, or 15th jack would also help.

The next item to be dealt with is :—

(2) *A Telephonist Picks Junction on Wrong Exchange.*

Provided order wire and junction field marking are both good, it only needs care on the part of the telephonist to prevent errors. There is, however, one point worthy of mention and that is whether Tandem or Toll A should be given a distinctive colour. These two exchanges are different from any other by reason of the fact that the exchange, as well as the number, must be given over the order wire, perhaps colour would prove an aid as TM jc's are often picked up for TL A, and vice versa.

It is conducive to error that the alphabetical arrangement of junctions in most exchanges places TM and TL A next to each other. In the interests of accuracy these 2 exclusive neighbours need parting or be given colour.

(3) *B Telephonist Allots a Junction but for Some Reason Forgets the Number Required.*

There is in B operating a factor which, although recognised, has never been provided for. Various expressions for use in given circumstances are at the disposal of the B telephonist, but no expression has ever been provided for use when, in the interests of accuracy, a second's grace is needed and traffic should be held back. The consequence is that telephonists allot junctions past the safety level, and wrong connexions are the outcome.

Exceptionally expert B telephonists probably need no such aid, but average B telephonists no doubt do, especially on split order wires, otherwise why so many wrong connexions ?

(4) *B Telephonist understands a Peg Number to be asked for when Number is O.K.*

The cause can only be inaccurate reception of the number, and the above remarks under (1) apply.

The number of wrong connexions due to this gives a slight index of what the " called in error " trouble must be like, as it is certain that only a peg in the multiple causes the monitor to be called in error instead of a subscriber.

Summing up, then, it would appear that at the very root of the wrong connexion difficulty is :—

(*a*) Faulty transmission or incorrect acceptation of either junction or number over order wires.

(*b*) B telephonists having no authorised means of holding traffic back, and at times taking in more work than can be accurately managed.

If the reasons for wrong connexions have been arrived at it only needs combined effort to cut the trouble down.

However, a certain percentage of error is bound to occur, and provision must be made for this.

It is therefore suggested that instead of the B telephonist sending a guard signal forward along an unproductive road, the call be sent backward to the controlling A telephonist by automatic means, and here the maintenance staff could perhaps be asked to step in and carry on the good work of recovering the waste by fitting a jack which, when a junction was connected to it, would transmit a flashing signal to the distant A telephonist.

The receipt of this flash, which should be a distinctive one, quicker and more easily detectable than a monitor's flash, would signify to the A telephonist that an abortive junction had been

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picked up, and that another should be obtained. So far as key-sending B positions are concerned the writer has not sufficient knowledge of the mysteries of automatic working to suggest how picked-up junctions should be dealt with, but no doubt some means would be possible.

With the growth of the automatic system there are other channels open for exploration, and London Tandem Exchange offers some very interesting points.

It is the pioneer exchange of its kind, providing direct order-wire communication to all exchanges within a radius of 10 miles from Oxford Circus.

Its value will perhaps be realised when it is stated that at some of the smaller exchanges 60% or more of the traffic is routed via this centre, all the old methods of indirect routing being cut out. Yes, we have advanced in telephone land and with the extension of the Toll A system we advance still farther.

But although under normal conditions Tandem Exchange proves such a boon there is a very important factor which has to be guarded against, and that is pressure, for pressure can create almost a deadlock. A Tandem telephonist, in accepting a number over a split order wire, has to do five things, viz., make mental note of calling exchange, allot a junction, mentally register called exchange and number, transpose name of called exchange into a code and finally key-out code and number.

It is therefore of the utmost importance that calls be transmitted over the order wire in orderly sequence, and that no breaking-in should occur. But both breaking-in and congestion do occur; one follows the other, and much valuable time is wasted and inaccuracies occur as a result. The question seems a very common one to write about, but it is one of first importance, and really a governing factor in the whole scheme. To overcome the trouble is not an easy task, but the difficulty being there it should be attacked.

It is suggested that when a telephonist meets congestion on the order wire she should not wait, but should make a note of the call, advise the subscriber: "I am trying to get them," and answer another call. If on the second attempt she again meets congestion, she should advise "Junctions engaged, shall I call you," and complete the call at the first opportunity. Why add to the disorder by breaking in? The telephonist may as well retire from the order wire first as last.

Order is the best manager of time, and to aim at this is a step in the right direction.

Under existing rules a call, for example, from Ravensbourne to Greenwich 0640 would be passed over the order wire as Ravensbourne-Greenwich 0640.

As a saver of time and in order to assist the Tandem telephonist in the mental acceptation of the call, it is suggested that a code for Tandem order wire use be given to each exchange, for example, X, Y or Z. Also that the work of converting the required exchange name into a code be performed by the A telephonist, and not by Tandem as at present. The call would be passed over the order wire as X-GRE 0640. This would help in four ways:—

(1) It would save seconds.

(2) It would prevent tandem telephonists from keying out the calling exchange in place of the called exchange.

(3) It would prevent phonetic inaccuracies, such as Woolwich being mistaken for Greenwich.

(4) It would assist tandem telephonists in the mental registration of the call. The quickness with which the guarding tone is connected, cutting out any necessary repetition of junction, suggests an aid is necessary.

The question of phonetic similarity between codes must not be overlooked, but this may prove a lesser evil. It is suggested also that on key-sending B positions, colour be introduced on the keys as an aid to the vision. Even one key marked green would help, say the 5th key. It should prevent errors such as this: 6691 keyed out for 6591. Colour would also be of great assistance when positions are taken over, as the telephonist then views some of the keys at an angle.

One other little point in connexion with C.C.I. positions. It is suggested that a white line about one-sixteenth of an inch in thickness be drawn from the cord to the associated clearing signal. A telephonist often works over a range of three positions and the clears are viewed at an angle. Every aid to accuracy is a time saver.

Space forbids many other little problems being mentioned, but the value of changing junctions on no reply calls would certainly admit of useful discussion. So also would the practice of waiting 5 seconds on a single clear before tapping off, and the question of the busy-back tone and the tone test, with over 30% of error on tests. All indirectly have a bearing on the subject of waste.

CONCERNING WASTE: THE VALUE OF SEGREGATION.

(Prize Paper.)

BY H. B. CARROLL, *Post Office Telephones (Traffic Section), Liverpool.*

MR. H. B. CARROLL.

IN the whole domain of human activity there is perhaps, nothing more familiar than waste, nothing which takes so many forms or which engages the thoughts of practical people as waste of time, of material, of energy. There arise, here or there, suggestions to "recover" waste, to "eliminate" it, or to prevent it; but all have their origin in an intuitive or practical objection to the thing itself, the desire to bring it under control or treatment.

A condition so generally manifest could scarcely be absent from an organisation so widespread as that which controls a public telephone service, or be exempt at least from critical attention. No apology is needed in making the prevention of waste an object of diligent pursuit at all times and in all places. Telephonic communication is a public and social necessity, and hardly could there be a service which depended more upon attention to methods for promoting efficiency, for to that end the control over waste is a powerful adjunct. In the present case efficiency, broadly, depends upon the fullest practicable use of time, material and energy—these, properly related, furnishing the basis for all co-ordination between the personnel and the plant engaged—to the end of creating a fruitful alliance between the industry as a whole and the public it is destined to serve. In every department, therefore, wherein some part of this vast organisation is carried on, there is need for constant vigilance, so that waste in any form

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may be effectively treated. It is the purpose of these notes to examine, in a general way, one of the many branches of enquiry, namely, the character of the work performed at certain operating and kindred positions; and to see whether there does not exist, in things as they are, some condition tending to waste, and the opportunity to derive some advantage from its study.

One of the most noticeable facts concerning the work of telephone operators—whether it be carried on at subscriber's, junction, trunk, monitor, testing or observation positions—is that it requires the employment of elaborate and costly plant. And although this plant (representing the "working" position) is only a part of the apparatus required, the fact of its existence is generally striking; whilst to those who have responsibility for its use, the occupancy of these valuable units of telephone equipment is a matter of vital concern. Obviously the number of such positions installed has a most important bearing upon the cost of providing service. The amount of work which an operator —the average operator—is capable of performing satisfactorily in a given time has therefore been a subject of the closest study; and upon these studies, and the standards derived from them, the number of positions required, the general design, and the size of the exchange premises largely depend. The "standards" are related to the proper "loading" of the various positions and are consistent with service of high quality. In the studies referred to, the manipulative time values of various types of telephone traffic and other operations have been resolved from observations taking account, in some cases, of so small a period of time as one-fifth of a second. This fraction of a second represents approximately one per cent. of the operating time of an average call; and to assist in forming a judgment of the effect of this apparently small consideration upon working expenses, it may be stated as amounting to some hundreds of pounds per annum for wages alone in a comparatively large exchange.

Preceding these studies there must, of course, be understanding of the character of the work proper to be carried on at the position. Even when that has been determined there is need, in practice, to consider the circumstances of its application. In what has been said of the effect which even one-fifth of a second may have upon working costs there is an illustration of the regard due to every detail which makes demands upon the attention and time of an operator occupying a position equipped with apparatus. The facilities afforded by the plant are limited. There remains the use which the operator will make of them: herein lies the condition most susceptible to control. Any tendency to acquire other functions at the position, and so to restrict its own peculiar capacity for service, needs critical examination. There should, so to speak, be established in the mind, for reference in many different circumstances, a principle that plant specifically furnished with the means for providing certain elements of service shall be used to the fullest practicable limits for that purpose; that other work, however incidental, shall be provided for elsewhere, especially if, as a consequence of its separation, it can be dealt with satisfactorily under simpler conditions. Not always could such a principle be rigorously applied. Regard for other conditions will often be necessary; but the principle is important and must, it seems, constitute the keystone to any such proposition even though subject to modification in the light of other requirements. Moreover, there may be periods when the staff at certain equipped positions are not fully "loaded," when some additional duty (such as routine testing) may be provided for without detriment to the ordinary services required at the positions. But circumstances which have relation to the "slack" hours have a different importance from that which is under consideration here, for the extent of the position equipment required is governed not by the conditions in those periods, but by the demands to be made upon the plant during the busiest periods of the day.

Some examples will serve to illustrate the point: At a switchboard position, a telephonist takes demands from subscribers, makes connexions, registers or prepares tickets for the calls. On a ticket there will ultimately be recorded the charge for the call. That, however, is an operation which can be done away from the switching position; not only at least as well done but, generally, at less cost—at a simple writing table. Again, matters which arise at the switchboard which would tend to impede the ordinary work of the position (thereby restricting the capacity of the plant engaged) are diverted, that is, they are referred to a supervisor or to a special desk where they can be effectively dealt with.

When so much has already been accomplished in the organisation of these matters, the field of enquiry would seem at first to possess little promise for further fruitful investigation, but another example will show how—only in comparatively recent times—the principle has been applied to the elimination of waste in the handling of phonogram traffic. Hitherto, it was customary for the operator at a message position to enter on the message form (in addition to other particulars) the originating subscriber's number and the charge; and, having done this, to "hold" the circuit connexions whilst she prepared a docket upon which these details (required for charging purposes) were repeated. This process involved waste to the extent that, during the preparation of the docket, the plant at her position was lying idle, unavailable for the receipt of a further message. By the omission from the message form of such details as are necessary for the docket (now a counterfoil), and the addition by stamping, at a separate position, of each message and its counterfoil with the same number, the identity of the message is provided for, the operation time at the message stalls reduced and the plant at those positions made available to fuller use.

When the volume of work at any exchange reaches a certain stage, some lines of demarcation become possible as between the various classes of work to be dealt with. The process of separation is sometimes known as "segregation"—the grouping of one class of work on one set of positions. As for an exchange, so in the system as a whole, expansion of the service and the enlargement of its functions lead to segregation. It is an extension of the principle of reserving to particular classes of plant the functions appropriate to it.

It is interesting to contemplate this process and its tendencies in the light of the future. Manual working is giving place to automatic machinery; but for certain purposes manual equipment will continue, and expand with the system itself. Segregation is likely, therefore, to survive as a problem for continuous study—efficiency and economy always supplying the motive. There may be visualised a development in this country resulting in the number of installed telephones being trebled, and a tendency to carry segregation to further stages in the form of centralisation, where work at present performed in individual exchanges would be removed, all work similar in character arising from a group of exchanges being brought together and dealt with at one suite of positions specially designed to deal with a large volume of that class of traffic. Whilst revision along these lines may not yet be due, it is useful to consider the trend of future requirements. It seems probable also that the nature of manually-controlled operations will undergo some material changes; and that these in turn will call for alterations in the structure of the organisation which at present prevails. To endeavour to appreciate the potentialities of segregation and, from the knowledge of its uses, to influence as far as possible the evolution of the service along productive lines, may therefore be regarded as reasonable aims to ordered progress.

Even in the consideration of things as they are, the study of segregation can hardly be less than a pursuit deserving serious attention, tending as it does to the concentration of effort, specialised control, and thereby the fullest utilisation of the plant available. It would be impossible in these notes to prescribe for any requirement without knowledge of the circumstances of the case, so that little more may be done perhaps than to call attention to an important principle, and to some of its applications—especially its bearing upon waste. To illustrate, however, the nature of

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possible enquiry into existing arrangements, the following are suggested :—

(1) Work which reaches the monitor's desk. The study of its character, and susceptibility to division, especially where several such positions are in use; and the removal of the simpler operations, such as the treatment of enquiries, to positions adequately but less elaborately equipped.

(2) Work performed at observation positions—where the service given at trunk and local positions is observed and charted; whether the plant at these positions is in a condition of full availability, and if not, to what extent that condition may be approached by the elimination of purely clerical operations not essential to the business of recording—that is, by the removal to office desks of incidental work, such as the totalling and carrying forward of information tabulated in the daily summaries.

(3) Work at manual operating positions. Careful examination of any proposal tending to impose upon the switching staff duties which could be effectively performed at simple positions of a clerical character; for example, the treatment of some element of ticket procedure intended to facilitate accounting either in the exchange or office.

In conclusion, it may be said that waste does not always "catch the eye." It can be very elusive. Its discovery may therefore be a fascinating occupation. But always its elimination or recovery are worth while. In industry, however, control over it must remain one of the powerful attributes of efficiency.

PARTY LINES.

A CORRESPONDENT writes :—

Reading an article in the *Telegraph and Telephone Journal* for April 1928, entitled "Recovering the Waste," it brought in my mind the waste there is in connexion with a residential subscriber's circuit. A would-be subscriber decides to have a telephone installed in his house, connected to the nearest exchange, for which he agrees to pay £1 7*s*. 6*d*. a quarter. In many cases the main reason for having the telephone installed is that the wife may do her shopping by telephone, and that other originating calls may be made for services so well described in circulars issued from time to time. The point I wish to emphasise here is that the circulars referred to advertise outward services chiefly, and there is no doubt this service is all that is required in a large number of cases. The use made of a Residential exchange circuit is an average of 2 or 3 calls a day at about 3 minutes each, or approximately 10 or 15 minutes for the whole day, the money value of which, including the subscription, is roughly £10 a year. Now take a residential main road and its adjacent bye roads, my idea is that if a main line were run for say 1½ miles from the exchange in the direction of these roads, and by means of spurs connect up a number of would-be subscribers along the road forming a Party Line, but for outward service only, to overcome the difficulty of code ringing for inward service, it might be possible to connect as many as 20 subscribers on the one line. That being so, it would, no doubt, be a paying proposition if a rental of 10*s*. a quarter were fixed for each subscriber which, with a possible one call a day each, would bring in revenue of approximately £50 a year for the circuit. It might also be a means of persuading some of these Party Line subscribers to have direct lines once they had found the benefits of the telephone and then wished to have inward service.

As regards the check on the timing of calls, I should think in these progressive times there could be some very simple electrical device for disconnecting a conversation at the end of three minutes or even a little longer, and also a contrivance for illuminating a small opal disc at the subscriber's instrument to signify to other subscribers on the line that the line was engaged. By this means, I do not consider the line would become congested, and we should be getting nearer the time when it might be possible to have a telephone in every home, and in the meantime to obtain subscribers who will never entertain the present tariffs.

NOTES ON ROCHDALE AUTOMATIC TELEPHONE AREA.

TRUNKING ARRANGEMENTS.

THE conversion of the Rochdale telephone area to automatic working involves the cut-over of eight new automatic exchanges, with a total of 3,880 lines. The new exchanges and their initial and ultimate capacities are as follows :—

Exchange.	LINES. *Initial.*	*Ultimate.*
Rochdale Main	2,050	4,000
Heywood	470	800
Shaw	380	900
Littleboro'	380	700
Whitworth	100	200
Milnrow	200	300
Norden	100	200
Castleton	200	300
Total ...	3,880	7,400

With the opening of these exchanges, subscribers in the Rochdale area will be provided with a full automatic service for all calls within that area, including calls from coin-box lines.

The system installed is the Step-by-Step Automatic System, similar to that which was recently cut over at Macclesfield. The application of this system to a multi-exchange area such as Rochdale introduces some interesting features in the trunking arrangements between automatic exchanges.

In the small satellite exchanges—Whitworth, Milnrow, Norden, and Castleton—there are no group selectors. All calls are routed through the group selectors in Rochdale main. This means, of course, that for local calls 2 junctions are used between the satellite and the main exchange, but traffic conditions warrant this arrangement, and it effects an economy in the satellite exchange equipment.

At the three larger satellites—Littleboro', Shaw and Heywood, a discriminating selector-repeating scheme is installed. In this scheme a subscriber on originating a call is connected through his line-switch to a discriminating selector in his own exchange, and, through an outgoing secondary switch associated with the discriminating selector, to an outgoing repeater and an incoming first selector at the main exchange. The 1st digit, which indicates whether the call is local or not, operates both the discriminating selector and the incoming 1st selector. If the call is local the discriminating selector releases the outgoing junction and restores to normal. The 2nd digit then operates the discriminating selector again, and this switch functions as a group selector extending the call to a final selector, which receives the last two digits.

If the call is for another exchange, the discriminating selector repeater remains set after the 1st digit has been dialled, but does not hunt. It holds the junction and the incoming selector, and the latter hunts for a 2nd selector in the main exchange, or in another exchange, according to the level to which it has been set by the 1st digit.

Calls outgoing from the Rochdale area to manual exchanges such as Manchester Central or City, Oldham, Bolton, Bury, Middleton, Liverpool Central, Bradford and Halifax, are routed via the central manual board in Rochdale main; thus, subscribers on Rochdale main, or any of the satellite exchanges, requiring a connexion with any of these manual exchanges, first dial "0," which routes the call to an "A" operator in Rochdale. The operator receives particulars of the call, and completes it over an order wire or signal junction. Trunk calls are routed in the same way via the Rochdale manual board.

Incoming traffic from the three manual exchanges, Manchester Central and City and Oldham, handled over order wire junctions terminating in cordless "B" positions in Rochdale main. From the cordless "B" position the call is extended through the automatic equipment to the particular exchange required, by the cordless "B" operator, who "key-sends" the four digits of the required number. The cordless "B" equipment is the same as is being installed in the London area.

A number of manual exchanges including Bolton, Bury, Burnley, Bradford, and Halifax, are equipped with dials at "A" positions, so that traffic to the Rochdale automatic area may be routed direct over "dialling-in" junctions to the automatic equipment. These junctions terminate at Rochdale main, in some cases in dialling-in repeaters associated with first numerical selectors; in other cases they terminate direct on first numerical selectors. The "A" operator at the manual exchange is thus able to complete calls to the Rochdale area without the aid of an operator in that area. Calls from Liverpool trunk exchange are dialled in a similar manner.

AUTOMATIC EQUIPMENT.

The main items of automatic equipment are as follow :—

Line and Final Units.—These are installed both in the main and in the satellite exchanges. Each unit carries the equipment particular to 100

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subscribers' lines. On one side the 100-line switches are mounted on two gates. The arrangement of the gates is such as to give easy access to the bank wiring of the lineswitches. On the other side of the line and final unit are mounted the final selectors which give access to 100 lines.

Trunk Boards.—These are installed in the main exchange and in the there larger satellites. In the main exchange they carry the 1st and 2nd group selectors which operate on the 1st and 2nd digits of the number dialled, and which build up the path to a final selector, giving access to the 100 numbers in which the required line appears. Each board consists of two racks, having a capacity of 120 selectors per rack. The terminal assembly on which the commoning required in trunking between stages is effected is mounted at one end of the trunk board. In the larger satellites—Littleboro', Shaw, and Heywood—the same type of board mounts the incoming 2nd selectors from Rochdale main, the discriminating selectors and associated outgoing secondary switches, and the outgoing relay groups reached from the latter.

In the smaller satellites these units are not installed, since there are no regular group selectors.

Repeater Racks.—In the initial equipment there are three repeater racks installed in Rochdale main exchange, mounting the relay groups in lines outgoing to automatic exchanges, and the " dialling-in repeaters in lines incoming from certain " dialling-in " exchanges.

Junction Apparatus Rack.—This rack installed in the main exchange, mounts the junction relay groups associated with those incoming junctions which are operated through the cordless " B " positions.

Sender and Outlet Rack.—This rack installed in Rochdale main, mounts the automatic equipment associated with the cordless " B " positions.

Special Apparatus Rack.—In each exchange a special apparatus rack is installed. In the main exchange this rack carries the miscellaneous apparatus associated with the manual board and desk circuits.

In the satellite exchanges the rack mounts repeaters (other than those associated with discriminating selectors), miscellaneous apparatus, and supervisory equipment.

MANUAL EQUIPMENT.

As indicated above, it is necessary even in the full automatic area, to have a certain amount of manual equipment to handle special service calls (assistance and enquiries, and calls to trunks, &c.) from automatic subscribers and also, since call-indicator equipment is not installed in the surrounding area, to deal with calls outgoing to manual exchanges.

The cordless " B " boards are advantageous where the volume of incoming traffic from manual is so large that it is undesirable to adopt the " dialling-in " scheme, which considerably increases the time taken by the originating " A " operator to deal with each call. The cordless " B " system enables the " B " operator at the automatic exchange to handle a load much greater than is possible at the ordinary " B " switchboard. At the same time the distant " A " positions and the operating procedure at these positions remain unchanged.

In the Rochdale area the manual board services are centralised in the main exchange which has 14 " A " positions and two cordless " B " positions.

FAULT ALARM ARRANGEMENTS.

To facilitate maintenance it is essential to have a comprehensive and yet simple supervisory scheme, which will give clear indication of the occurrence of any fault in the automatic equipment, or of any faulty operation on the part of the subscriber which would hold apparatus unnecessarily. This supervision is provided by a series of ceiling lamps in a conspicuous position in the exchange, the lamps being coloured to indicate the nature of the fault. In certain cases an audible alarm is provided by means of a bell. In addition to the ceiling lamps common to groups of apparatus racks, individual lamps are provided at each rack to assist in locating the fault.

In the satellite exchanges, arrangements are made for extending the alarm where necessary to the main exchange. In Heywood, where there is a local test desk, the alarm is given locally during the day. At night by the operation of a key, the alarm is extended to the manual board at the main exchange over one of the lines, which is also used for " O " level (assistance) calls. The operation of the same key suppresses the local alarm at night.

In the case of satellites other than Heywood, the alarm during the day is given locally, and at the same time is extended over one of the test lines between the main and the satellite exchange, announcing the fault at the Rochdale test desk. At night, by the operation of a key, the local alarm at the satellite exchange is suppressed, and the alarm is extended to the manual board at Rochdale.

POWER PLANT.

The power plant in an automatic exchange such as Rochdale differs from that in a manual exchange, mainly with respect to the capacity of the battery and charging plant and the scheme of power distribution to the apparatus. The increased battery capacity is, of course, necessary for the operation and holding of switches used in setting up a connexion.

In distributing power to the apparatus racks in the exchange, common leads are run from the power board to a centrally located distribution fuse panel. From this panel leads are run through fuses to groups of apparatus racks, the cross section area of these leads being such as to ensure correct operation of the switches, and to avoid cross talk or switch noise.

In addition to the main batteries, a small battery of 50 volts is necessary to give the additional voltage required for the " booster metering " scheme adopted in the area.

A battery of seven counter E.M.F. cells is installed at the main exchange for reducing the 50-volt exchange battery supply to the correct voltage for supplying power to manual P.B.X.'s.

In the main exchange, Standard Telephones & Cables Ltd. were responsible for installing the whole of the power equipment, with the exception of the booster battery, which was supplied and installed by the G.P.O.

In the satellite exchanges, the batteries, power board, and charging machines were supplied and installed by the G.P.O. The ringing panels and ringing machines were ordered and installed by Standard Telephones & Cables Ltd.

SIGNAL TONES.

The signal tones used in the Rochdale area are those which have been standardised by the G.P.O. for all automatic exchanges. These tones are necessary to give the subscriber an indication of the progress of his call, as follows :—

Dialling Tone.—This tone is received by the subscriber when he has lifted his receiver, and when his line-switch has found a free 1st selector. It indicates to the subscriber that the automatic equipment is ready to receive his call.

Ringing Tone.—This tone is given to the subscriber if, at the end of dialling, the automatic equipment has secured a path to the desired line. It indicates to the subscriber that the bell at the station he is calling is being rung, and that, therefore, so far as the automatic equipment is concerned, the call has been successfully completed.

Busy Tone.—This indicates to the subscriber that his call has been unsuccessful, due either to one of the automatic switches having failed to find a free path to a subsequent switching stage, or due to the called line being already engaged on another call at the moment when this call was made.

Number Unobtainable Tone.—In the automatic equipment it is impossible to avoid having certain paths which may be selected inadvertently by the subscriber and which do not lead to any subsequent stage, or any subscriber's line. For example, it is necessary to reserve certain levels on selectors for extensions. Should a subscriber dial a number which brings him on to one of these paths, that is, should he, for example, dial a number which brings him on to a spare level, or an unallotted number in a final selector, he is given an indication of his error by a distinctive tone, called the number unobtainable tone. The same tone is given to the calling subscriber if he calls a line which is temporarily out of order, or " plugged up " for other reasons.

STROWGER AUTOMATIC TELEPHONES.

WE have received two bulletins from the Automatic Telephone Manufacturing Co., one (No. 300), a very useful and well illustrated production of some 60 pages containing a description of subscribers' and exchange apparatus, exchange equipment (with good diagrams) and an account of the Tandem exchange in London. It is supplemented by an imposing list of the places in England, the United States, Canada, Japan, the Argentine, India, Australia, New Zealand, Iraq and other countries where the Strowger system has been or is being installed.

The other booklet, styled " The A.T.M. Universal Duplex Unit," describes the operating features, advantages and testing features of this unit, and is also well illustrated with photographs and diagrams.

THE AUTOMATIC TELEPHONE EXCHANGE AT THE NEW UNIVERSITY COLLEGE, NOTTINGHAM.

THE new University College, Nottingham, which was formally opened by His Majesty the King on July 11, is equipped, for inter-departmental communication, with a private automatic telephone exchange. The switchboard installed is one of a series specially developed by Ericsson Telephones, Limited, 67-73, Kingsway, London, W.C.2, for small private installations.

The initial equipment of 32 lines and 5 links or connecting circuits, can be increased to 44 lines and 7 links, and by means of an additional panel an ultimate capacity of 89 lines and 14 links is given. The components are identical with those supplied to the British Post Office for public exchanges. The links consist of a set of relays arranged in unit form on the jack and plug principle, so that it is quite an easy matter to make an addition, or to remove a set for examination, should a fault occur. This feature, together with the accessibility and designation of the various parts, simplifies installation, and especially maintenance. The equipment operates from a low-capacity central battery of 24 volts, and the charging panel, for convenience in this case, is lined up with switchboard unit.

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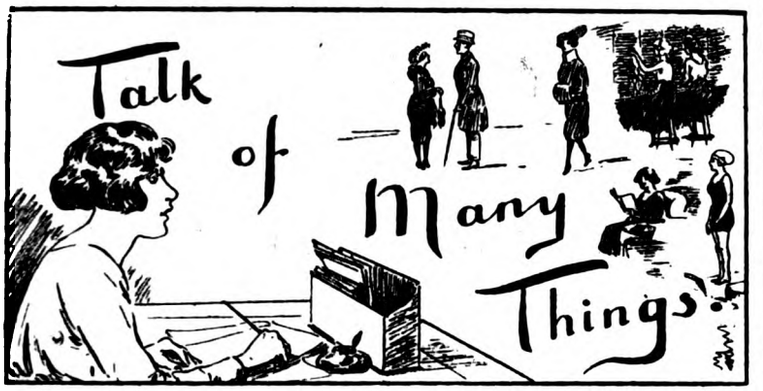
WE TELEPHONISTS



Written in the Heat of the Moment.

PHEW! Isn't it hot! That, of course, is a perfectly ridiculous remark and so unnecessary. If it were not hot I should not have said it, and as it is hot there is no need for me to say it. It is highly probable, moreover, that by the time you read this it will no longer be hot and you will wonder vaguely why ever I made such a remark. But it is just the senseless sort of thing that we all say from time to time, and I am vastly relieved to be able to think that I am not peculiar in my peculiarity.

Think of the consternation it would cause if I asked the same question on a bitterly cold day. Yet why should it be any more ridiculous to call attention to what obviously *is*, than to call attention to what obviously is *not*? I would tell you the answer if it were not so hot—too hot indeed to think.

One of these days when it is again very hot, I shall be oozing around in a feeble, starchless manner asking the same silly question. I know that I shall meet with the same silly answer—the answer that is always uttered in a particularly hearty tone of agreement—"Yes, isn't it!" And then suddenly the world will stand still, a solemn hush will settle over everything, and amid the stillness and silence a harsh solitary voice will cut through the hot heavy air like a flash of brilliant sound and the words will snap out viciously—"No! It isn't!" Then the ninety and nine just persons will reel dazedly. The one Daniel among the lions will glare round defiantly and shout out again a vehement denial in a voice of brass, which will rebound in the vaults of heaven and roll away among the hills. After that the world will gradually return to consciousness, and its pulse will again begin to throb.

What will happen to the one bold man I don't know. Perhaps he will be confined to a museum as a rare example of sanity—but I doubt it, and in any case it's much too hot to bother about him, isn't it? Phew, yes.

PERCY FLAGE.

To the Editress.

Dear Madam,—I was very shocked to learn that "Devoted Model" was the original of the "Girl at the Desk," because hitherto I had supposed that she was a creation existing only in the artist's horrid imagination. I am considerably relieved, however, to be assured that Clerkenwell School has—well, a modifying effect. It is at least comforting to be able to hope.

Of course, now that I know the truth, I can appreciate that "Devoted Model" must have felt rather peeved at my innocent remarks, and I suppose I deserve the severe castigation she has administered. But if she has dealt with me so drastically, what must she have done to the artist who so cruelly caricatured her beauty! My one desire now is to meet what is left of him and to inspect the wreck that was once man.

Well good-bye, dear—er, beg pardon—I beg to remain, dear Madam,
Your obedient Servant,
PERCY FLAGE.

An Old Bore's Almanack.

Wherein is forecast those strange things which will occur in the telephone world each month, every year:—

January.—Disputed accounts will provide checks on cheques. Traffic Officers negotiating will go armed.

Staff authorities will throw a gloom over all exchanges.

February.—Follow-up observations on *all* outgoing calls will commence, redundant staff operating.

Odd days will be taken by odd people.

March.—About the tenth of this month the Call Office Attendant will be heard calling his mate.

Spring will be in the air, and a male cleaner will hum as he props up the mop.

April.—All Fool's Day will occur on the First—and as often after as a subscriber gets a wrong number.

Swimming Club secretaries will emerge from their winter sleep and share pushers for tennis clubs will become aggressive.

May.—Queens of the May will be called early if 8 a.m. duty. A general rising will take place in telephone exchanges at 8 p.m. each evening.

Traffic Superintendents will commence bringing their garden produce (purchased en route!) to decorate the Chief's desk.

June.—This is the month of roses: amorous engineers will find there's never a rose of a telephonist without a thorn of a Supervisor.

Towards the end of the month a Contract Officer will develop peculiar symptoms and offer to forego his commission. . . . This will seal his doom.

July.—Holiday fever will begin to break out. Boarding houses and bathing costumes will fill up.

A C.C.I. marker will contract St. Vitus' Dance and will only be soothed by a routiner injection.

August.—Continental boat trains will be full of Supervisors taking Mothersill and a trip to Europe.

An I.D. Officer will admit it was entirely her fault.

September.—Bonuses will loom largely on the horizon. A night operator will forsake pints for points.

During this month a subscriber will make a complaint and cause thereby great consternation.

October.—Peg Counts will be completed after reference to Mrs. Beaton. Discussions will continue as to when a figure is representative.

On the twentieth precisely, a caller will successfully use a Multi-Coin Box, and will be given an honorary A.M.I.M.E. degree.

November.—Fogs will delay operators reaching exchanges but most of them will be found O.K. An engineer will ask the meaning of R.W.T.

December.—This is the month of indigestion.

An outer London exchange will promote a social and forget to thank the M.C. in the *Journal*.

X. Y. Z.

Competition.

Owing to the absence of the EDITRESS (to whom we wish a speedy and complete recovery) on sick leave, the judgment of the Competition Sketches for the heading of this column has been postponed. A further announcement on the subject will be made next month.

Contributions to this column should be addressed THE EDITRESS, "Talk of Many Things," *Telegraph and Telephone Journal*, Secretary's Office, G.P.O. (North), E.C.1.

PRESENTATION TO MR. F. W. A. CLUTTERBUCK.

Mr. F. W. A. CLUTTERBUCK, Assistant Traffic Superintendent, Manchester, has been appointed Traffic Superintendent, Class II, and transferred to Chester.

An informal gathering was held in the dining room on Friday, 22nd inst., for the purpose of bidding him good-bye, and to "speed the parting guest" with several tangible expressions of our good will.

In the absence of the District Manager (Mr. J. T. Whitelaw), Mr. Parry, Traffic Superintendent, officiated. In a humorous way he traced Mr. Clutterbuck's descent from the old "voyageurs" from Bristol, who left their mark on the American Continent (Mr. Clutterbuck being a Bristolian), and on behalf of the staff at Manchester wished him all the success he deserved in his new district; after Mr. Battersby (his particular Acting Traffic Superintendent colleague) had said a few eulogistic words, Mr. Parry made the presentation consisting of a loudspeaker and a handsome case of fish-eaters from the staff at Peru Street; A cut-glass salad bowl with servers, and a flower vase from the City and Trunk exchange staffs.

It is also understood that Mr. Clutterbuck was the recipient of other gifts from members of the staff at Head Post Office.

Mr. Clutterbuck, in happy vein, suitably responded, and expressed his sincere regret at having to leave his many old friends at Manchester.

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IMPERIAL WIRELESS AND CABLE CONFERENCE.

WE publish below a summary of the Report of the Imperial Conference which was appointed to examine the situation that has arisen as a result of the competition of the Beam wireless with the cable services. The personnel of the Conference has already been mentioned in the March issue of the *Journal*; it included no member representing the British Post Office as such.

The report begins with a general summary of the position. In the course of the summary an estimate of beam traffic, based on the three months March to May, 1928, is given as follows :—

Canadian service	... ...	6,000,000 words.
Australian service	... ...	9,000,000 „
South African service	...	9,000,000 „
Indian service	... ...	10,500,000 „

Although there is evidence of an appreciable increase in the total volume of telegraph traffic, the Conference were informed that the cable undertakings affected by the wireless rate reductions and the Indo-European land-line service had been brought to a serious position by the reductions in rates adopted in order to meet beam competition and by the loss of a considerable volume of traffic to the beam services. The Pacific Cable Board, as a result of generous budgeting and drastic economies, succeeded in making a small profit for the year 1927-28.

The Conference consider that the Australian, South African and Indian beam services could afford to make a further substantial reduction in rates and still give a handsome return on the capital invested, and that if competition remain unrestricted, the beam would render the cable systems unremunerative. It was suggested to the Conference that " those responsible for the Cable Companies might be pressed, unless a satisfactory means of obviating the effect of acute competition could be provided, to liquidate their undertakings at once and distribute their large reserves among their shareholders rather than to remain in operation and dissipate their resources."

The Conference consider that the cable system must be retained. They give three reasons :—

(1) Many parts of the Empire are not at present served by wireless and may not be for some time to come.

(2) The existing wireless services are subject to fading and occasional prolonged interruption which would constitute a serious hindrance to urgent commercial telegrams if the cables were not available.

(3) The cables have a strategic value.

After an allusion to the increasing influence of foreign competition, the Conference proceed to discuss possible lines of solution. They rule out non-intervention and the payment of a subsidy as plainly impracticable, and they consider that the guarantee to the cable system of a minimum revenue or the institution of some sort of " pooling " scheme would furnish only a temporary solution. They prefer the solution of a fusion of the cable and wireless interests concerned, and have ascertained that, apart from certain reservations on the part of South Africa, the Governments concerned had no objection to the search for a solution on these lines.

The Conference then outline the merger proposals submitted to them by the Eastern group and the Marconi Company. The total proposed capital of the Merger Company is £53,700,000, divided into Preference, " A " Ordinary and " B " Ordinary shares in the proportions roughly of 23, 21 and 9. The greater proportion of the preference and the " A " ordinary shares would be allotted to shareholders in the Eastern group and the greater proportion —65%—of " B " ordinary shares to Marconi shareholders. The merger would acquire the whole of the capital of the Marconi Company but only the ordinary capital of the Eastern group. The arrangements contemplated by the companies included the transfer to the merger of the beam wireless and cable assets of

A

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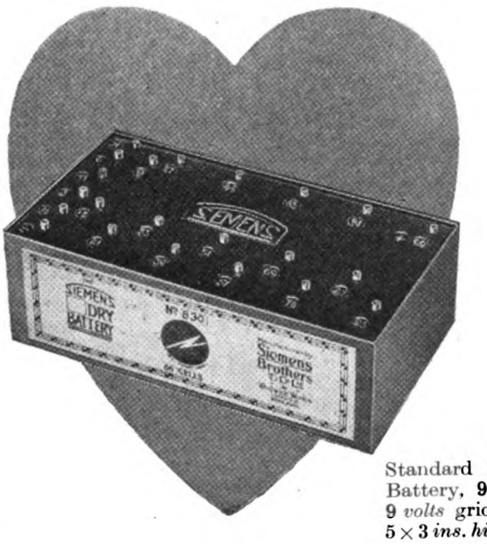

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H.M. Government in Great Britain, and the Conference thought it possible that unless the beam installation were transferred to the new company the merger would not, in fact, take place. The Conference arranged for the whole scheme to be examined on their behalf by two financial experts, Sir Otto Niemeyer and Sir William McLintock, and ascertained that H.M. Government in Great Britain, while reserving its decision until precise details of the scheme were available, did not preclude the Conference from enquiring into the possibility of the transfer of the Government cable and wireless services to the merger company.

The Conference consider that a solution on these lines would be satisfactory and recommend accordingly. They recommend that in addition to the merger company there should be established a Communications Company which would own all the communication assets of the Eastern group and the Marconi company (i.e., excluding the investment interests of the Eastern group and the manufacturing, &c., interests of the Marconi Company), would acquire the holdings of the companies concerned in other communication companies, would acquire the Government cables concerned, and would lease the beam stations. The capital of the Communications Company is not to exceed at its inception £30,000,000.

The Conference recommend that the transfer of the Government undertakings concerned (i.e., the sale of the Pacific and West Indian systems of the Pacific Cable Board and the Imperial Cables and the lease of the beam services) should take effect as from April 1 last. The company would be required to provide for the transfer of existing staffs and to make payments as follows:—

(*a*) for the beam services, which would be leased for 25 years, a capital payment of £60,000 and a basic rent of £250,000 per annum with an addition (after 1931) of 12% on any increase of the company's profits from communication services above the standard revenue;

(*b*) for the Imperial Cables a capital sum of £450,000.

The Conference recommend that the board of directors of the Merger and Communications Company should be identical, and that any increase of net revenue from communications service above a certain standard revenue (which is equivalent to about 6% of the capital of the communications company) should be divided in the proportions of 50% to the company and 50% to reduction of rates, &c. The Conference recommend that an Advisory Committee consisting of the British and Dominion Governments concerned should be set up, and that the company should be bound to consult them on questions of policy; no increase of rates would be permitted except with the consent of the advisory committee. They recommend finally that the external telephonic services of Great Britain should be reserved to the British Post Office, which would agree with the company as to the terms on which it would have the right to use the company's wireless stations.

The report is sad reading, and on the whole we had better refrain from comment. It will suffice to say that although the report makes no reference to the manner in which the beam services have been administered and operated by the Post Office, it makes it clear that it was their outstanding success that created the whole problem; and the Post Office played no small part in establishing this success. In spite of the report and whatever its outcome may be, we may reflect on our achievement with pride.

GLASGOW TELEPHONE NOTES.

Mr. J. B. Mathieson, late of the Edinburgh District, took up his duties as Traffic Superintendent, Class II, Glasgow, on July 1. We offer cordial greetings to him and we trust his stay with us will be marked by every success and happiness.

Our congratulations to Miss J. B. McArthur on her promotion to the Telephonist Allowance post at the Clydebank Exchange.

Good wishes to Miss E. Welsh, telephonist, of the Bridgeton Exchange, who resigned the Service on June 30 to take up residence in London, Ontario. As a token of appreciation her colleagues presented her with a wristlet watch.

Congratulations to the following Contract Officers: Mr. S. W. Russell, promoted to Acting Contract Officer, Class I; Mr. J. Blackwell, Mr. R. S. Forsyth, Mr. A. E. Dickson, Mr. R. H. Wilder, promoted to Development Duty Officers, with allowance.

In the midst of a spell of weather which merited the worst criticism ever passed upon it, Tuesday, July 3, was ideal for the outing arranged by the Glasgow Post Office War Hospitals Entertainments Committee for the patients from Bellahouston and Ralston War Hospitals.

Lt.-Col. and Mrs. Westbury represented the postal staff and Mr. Reid, Acting Contract Manager, deputised for Mr. Coombs (Chairman), who was on leave.

Leaving Bellahouston Hospital by chars-a-banc at 1.15 p.m., the route was via Helensburgh to Luss. There the party embarked on motor-launches for a trip down Loch Lomond to Balloch. High tea was served at Balloch Castle Tea Rooms, where Mrs. Campbell, the manageress, gave the party a hearty welcome and a splendid tea, which was thoroughly enjoyed by everyone. The company then wended their way to the putting greens, where a competition took place. Some very good scores were returned and Mrs. Westbury presented the prizes. A pleasant run home in the cool of the evening completed a "perfect day."

The following is an extract from a letter received by the Secretary of the Committee from the Medical Superintendent of Bellahouston Hospital:—

> "On behalf of the patients of this hospital, would you please thank the members of the staff for all the kindnesses shown during the past year. The entertainments have all been thoroughly enjoyed and are always looked forward to by the men.
>
> "The outing yesterday was the best event of the year and the patients are full of enthusiasm over it."

J. L.

Coloured Telephones (Applications for).

OFFICIAL: ". . . and I would like an instrument of royal blue colour."

(*Note.*—The wishes of the subscriber, an admitted supporter of Rangers F.C., have been met.)

UNOFFICIAL: "My telephone that was orange has all peeled off. Please have it repainted red, white and blue, as my mother-in-law died this week."

D. REID.

Pollok Estate Park.

Birds twit their songs and flit
From tree to tree;
The evening still hath cast its spell
O'er me.
The pool is full of living things,
And over it
Myriads, on tiny wings,
Hover.
The wondrous hush of tree and bush
At even
Doth fill my soul with peace
of Heaven.

M. L. TULLOCH.

On Relaxation and Holidays.

"The mind is very apt to receive a strong cast from the manner in which it is employed. When a man is constantly engaged in something which requires great study and application, he is in danger of acquiring a hardness of temper which will make him disagreeable, or a tone of mind which will render him incapable of going through the common duties of life as a friend, a relation, or a parent. Nothing will preserve him from these bad consequences so much as his taking advantage of a holiday, and allowing himself to be unbent with recreations of an easy, and in themselves of a frivolous nature. This will not only afford him an agreeable relaxation, but will give his mind a gentleness and a sweetness which all the hardness of application, and all the agitation of his employments, will not be able to destroy. There is no anecdote in antiquity which I have read with greater pleasure than that of Scipio and Laelius, related by Cicero: 'I remember to have heard that Laelius and the great Scipio were frequently wont to fly from the hurry of business and the bustle of the town to a quiet retreat in the country, and there to grow, as it were, boys again in their amusements. Nay, they used to pass their time at Caista and Lauresitium in gathering shells and pebbles on the sea-shore, unbending their minds, and amused with every trifle.'"—The *Mirror*, August, 1779.)

"There were times when I could not afford to sacrifice the bloom of the present moment to any work, whether of the head or hands. I love a broad margin to my life."—(Thoreau.)

"'You should learn to read, Jasper.'

"'We have no time, brother.'

"'Are you not frequently idle?'

"'Never, brother; when we are not engaged in our traffic, we are engaged in taking our relaxation; so we have no time to learn.'"—(Borrow.

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LONDON TELEPHONE SERVICE NOTES.

Contract Branch Notes.

THE results obtained by the Contract Branch during the month of June were a net gain of 2,542 stations as compared with 2,254 stations for the corresponding month of last year.

* * * *

The following letter indicates how the kiosks which are dotted all over London are appreciated by visitors from distant lands :—

"Two years ago on my last visit from Australia, I had cause to write you rather strongly about your so-called Public Telephones, which in the district of Lee and other places were inside shops locked up at 8.0 p.m. I find on this visit around the S.E. district of London that the 'phone is in the street and can be got at morning, noon and night—allow me to congratulate you on the improvement.

At first you will find the boxes will not pay or may be damaged by the rough element, all that is necessary is the "birch" or "cat" for the rough element and a few catchy advertisements as : "Use the 'phone, pay 2*d*. to do your shopping and save wet feet and shoe leather."

. . . .

The thousandth kiosk has now been brought into service and the number in use is being increased at the rate of fully one a day.

* * * *

The writer of the following letter appears to believe that there is luck in odd numbers. Their oddness must be beyond reproach for him to be satisfied :—

"As soon as possible, I request that I may be given a list of VACANT numbers to choose from.

I want a number whose DIGITS add either to 1, 5, or 7 (AND NOT to 2, 3, 4, 6, 8 or 9).

THUS, for example, my present number 5947 adds to 7 (5 plus 9 plus 4 plus 7 add to 25, and 2 and 5 add to 7).

Example for a new number :—

3151 add to 1. (3 plus 1 plus 5 plus 1 = 10 = 1).
6287 add to 5.
7999 add to 7.

Any of these would do or any that similarly added to 1, 5 or 7.

Therefore, I SHALL REGARD IT as a FAVOUR and extension of the courtesy I have formerly received if a number is chosen for me as above, or if I am sent a list of vacant numbers to choose from."

* * * *

Sports Notes.

Cricket.—A decisive game was played on Tuesday, July 10, at Chiswick, between the Contracts Branch and Traffic Branch, which resulted in a complete victory for the Contracts Branch by 138 runs. There was considerable enthusiasm at the conclusion of the match, which resulted in the Contracts' team annexing the L.T.S. shield for the first time.

Much credit for the success of the team is due to Mr. T. Culley, the Secretary, who has for several years been mainly responsible for the sports activities of the Contract Branch, and to him more than any other individual must the success of the team be attributed.

SCORES.

Contracts.		*Traffic.*	
Hodgkiss	17	Beaumont	5
Wilson	4	Thomson	0
Holdstock	43	Mears, not out	14
Pearks	4	Evans	0
Oliver	6	Berry	0
Cowdray	53	Niles	0
Goodger	16	Gerrard	12
Griffiths	0	Gregory	0
West	11	Hancock	0
King	4	Holcombe	0
Sharp, not out	0	Extras	2
Extras	13		
Total ...	171	Total ...	33

Pearks and Holdstock bowled unchanged for Contracts. The former took 6 wickets for 13 runs, and Holdstock had 3 wickets for 16 runs.

For the Traffic Branch Capt. Berry bowled well and took 7 wickets at a small cost.

A team selected from the rest of the league will play the champions in a match at Chiswick before the close of the season.

Boy Messengers' Cricket.

A most enjoyable and interesting afternoon cricket match took place on June 28, at Chiswick Polytechnic Ground, between the Cornwall House Boy Messengers' team and the Accounts Branch Club.

The Messengers won the toss and elected to bat first. It was soon apparent that these young fellows knew the game, and the innings finished with the creditable score of 112. The last man in, Sander, was top scorer at 29. The Accounts only managed to get 81, this giving the Messengers a comparatively easy victory. The bowling and fielding of the winners was excellent, while that of the Accounts' men was below their standard. Among the supporters were Mr. Valentine, whose presence greatly encouraged the players, Mr. Stirling and Mr. Bold who did so much to promote the success of the occasion. One must not forget a number of young ladies who took a very keen interest in the play of the Messengers. Mr. Hugh Williams, the Chairman of the L.T.S. Sports Association, was also present. Capt. Berry umpired.

An effort is being made to arrange another match before the end of the season. The fixture will be duly advertised, and it is hoped an equally enjoyable afternoon will be spent ; the pleasure will be considerably enhanced by the attendance of a greater number of the staff.

* * * *

Bowls.

The L.T.S. team was defeated in the "Bunbury Cup" competition at Chiswick on July 17 by the C.T.O., who thus obtained their revenge for the defeat inflicted upon them in the corresponding match last year.

A notable achievement is the appearance in the final of the London Area Rink Competition of an L.T.S. team skippered by Mr. R. Cleland.

* * * *

Tennis Competition.

Steady progress is being maintained in the competition for the "Agnes Cox" Cup between ladies' teams.

In the second round :—

Wimbledon beat A.N. Section.
Tottenham beat Chiswick.
Avenue beat Ravensbourne.
Clerkenwell beat A.R. 3.
A.R. 4 beat Trunks.

In the third round :—

A.R. 4 beat Wimbledon.

* * * *

"Night Optimists."

This Concert Party, organised by the Night Staff, gave another very successful performance on July 1 at the Surrey Masonic Hall. The G.P.O. (South) Staff are to be congratulated upon the excellence of the talent displayed, and give promise of becoming entertainers of high order.

* * * *

Promotions.

To Assistant Supervisor Class II :—

Miss MABEL E. SMITH, of Royal.
" N. HAMER, of Museum.
" LILIAN M. BANKS, of Sloane.
" M. S. PROSSER, of Rodney.
" M. C. MOONEY, of Finchley.
" E. G. HUTCHINGS, of Clerkenwell.
" F. K. E. WATERHOUSE, of Hampstead.
" K. BRAIN, of Kingston.
" E. C. WARNER, of Maida Vale.
" L. A. WILKINS, of Royal.
" M. L. HARRIOTT, of Paddington.
Miss M. CONNOR, of Clerkenwell.
" F. J. KEEL, of Gerrard.
" G. M. TURNER, of London Wall.
" S. E. CHAPLIN, of Tottenham.
" L. A. BOSTOCK, of Park.
" N. HUCKELL, of Riverside.
" E. M. SYRETT, of Central.
" A. PRICE, of Langham.
" E. M. GOODING, of Kensington.
" L. JENNINGS, of Avenue.
" G. E. LEWINGTON, of Museum.

Miss E. D. EVANS, promoted to Assistant Supervisor Class I should read :—

Miss E. D. STEVENS, promoted to Assistant Supervisor Class I.

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THE

Telegraph and Telephone Journal.

VOL. XIV. SEPTEMBER, 1928. No. 162.

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Subscription: To the public, 5s. 0d. per annum, including postage. To the Staff, 3s., including free delivery to any Post, Telegraph, or Telephone Office. Single Copies: To the Public, 4d. each, or post free 5d. To the Staff, 3d. each. Orders should be sent to the Managing Editor, TELEGRAPH AND TELEPHONE JOURNAL, *G.P.O. North, London, E.C.*1.

All correspondence relating to advertisements should be addressed to MESSRS. SELLS, LTD., 168, *Fleet Street, London, E.C.*4.

TELEGRAPH AND TELEPHONE MEN AND WOMEN.

LVI.

MR. E. GOMERSALL.

MR. E. GOMERSALL, who was recently appointed Deputy Superintending Engineer for the Metropolitan District, is 52 years of age. He entered the Post Office service at Leeds as a Telegraphist in the Spring of 1893, and he transferred to the Engineering Department three years later. In 1898 he came to Headquarters, and his subsequent advancement was phenomenal. By 1909 he had become an Assistant Superintending Engineer and promotion to Superintending Engineer came to him in 1915.

Whether Mr. Gomersall is a typical Yorkshireman we do not know, but at all events he possesses in full measure the grit, determination and hard-headedness usually associated with the county of broad acres. Mr. Gomersall has remarkable force of personality and his keenness on his job is almost a byword in engineering circles. Since 1915 Mr. Gomersall has been in charge of the North Midland District, and for his services during the war he received the honour of appointment as an Officer of the Order of the British Empire. Last Spring he was brought to London as Deputy Superintending Engineer.

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INTERNATIONAL TELECOMMUNICATIONS AND FOREIGN LANGUAGES.

BY J. J. T.

A time may be coming when business and political intercourse will make some one or two languages understood by the educated all the world over.—"Daily Telegraph."

FOR well over half a century international telegraphy has been an everyday fact, little realised by any but those sections of the State and private activities directly interested in Anglo-foreign trade and finance. On the other hand, the very rapid strides which international telephony has made during the latter part of the present decade, with that very personal touch which telephony alone can give to the individual public, and the much wider and more aggresive publicity now made possible by the modern press, have quickened the sense of interest and wonder in long-distance telephony, and that, over more extensive areas than was possible during the similar stage of telegraph development: let us say during the first twenty years of Anglo-European telegraphy with its then restricted Continental ramifications.

The language difficulty to-day in all matters of international communications has, therefore, without doubt been better realised since the rapid extension of international telephones than had hitherto been the case with international telegraphy, and by so much the latter section of telecommunication has benefited. It is feared, however, that the extent to which a knowledge of foreign languages is absolutely necessary for the efficient administration, supervision, and operating of international telegraph circuits has not always and everywhere been acknowledged.

From time to time there have been very serious efforts in the direction of inventing an artificial language for international use quite apart from the needs of telephony or telegraphy, the Volapuk and Esperanto systems, for example, the former now seldom mentioned.

In 1911 there was founded in Paris *L'Association Espérantiste du Personnel des P.T.T. de France et des Colonies*, which, up to 1914, was the most important professional Esperantist association in the world. The war cut short its activities, but these were revived in 1920, and in 1921 the high patronage of M. le Sous-Secrétaire d'Etat des P.T.T. was accorded to this worthy organisation, and Esperanto was subsequently formally acknowledged as an auxiliary language for inland use throughout France, by the Telegraph and Telephone Administration of that country.

Esperanto has since been added to the list of authorised languages for public use in international telegrams.

This artificial tongue appears to have made very considerable progress. Certainly in postal, telegraph, and telephone circles it has enthusiastic supporters among the staffs in many parts of the world.

It has not yet taken much hold in this country inside the Service, but quite recently some 70 members of the Lancashire and Cheshire Esperanto Federation being present at Evensong in Waddington parish church, near Clitheroe, the service was conducted in Esperanto, the lesson being also read in that tongue by a youngster in his early teens! This incident is cited to suggest that, despite its artificial genesis, there would appear to be no inconsiderable pliability about the system. A well-attended international Esperanto conference was recently held in Antwerp.

Such a language, however, even its promoters do not wish to utilise save as an *aid* to international converse, for Petro Filliatre, its energetic and most enthusiastic protagonist, in *Le Lien des P.T.T.*, the quarterly organ of the Post and Telecommunications Esperantistes, writes thus: "The aim of Esperantists is *not* to supplant national languages. Esperanto even becomes an unsuspected aid in their study. By the side of one's mother tongue it becomes an auxiliary language, an international *liaison*. Esperanto comes to abolish that present monstrosity of two civilised men finding themselves face to face without the power to understand one another."

Praiseworthy as is both the motive and the aim of the Esperantists, the restricted extent of the claim for its use by the sponsers themselves of this most widely acknowledged of artificial languages, for the moment, at any rate, it must be reluctantly admitted that the need for a knowledge of two or even three European languages still remains a *sine qua non* in the most efficient administration, supervision, and operation of the world-wide telecommunications.

Useful work has been done by internationally appointed sub-committees by the compilation, in parallel columns, of international vocabularies of engineering, technical, and operative terms in three or more languages.

There has also been recently published a most comprehensive international dictionary of engineering terms giving the equivalents in six languages for every conceivable machine, engine, &c., and every single screw, bolt, cam, pinion, &c. All these materially help in many ways but such methods cannot be considered as satisfactory for any but very elementary needs.

One, of course, hears the insular mind vocalising "Why don't they all speak English?" Insular minds are not, however, confined to those living on an island, for it is reported that at the last international conference held in Washington not half the American delegates could speak any language but their own, while not so very long ago there was some hubbub in a certain European capital because some of the local firms were selecting salesmen with a knowledge of foreign tongues instead of "compelling their customers to speak the language of the country." It was even considered to be a degradation of one's mother tongue thus to set it aside for mere commercialism!

These side-lights upon the matter of languages give proof, if such were needed, of the sensitiveness of the earth's peoples on this subject, and show how far off are the nations from agreeing to the substitution of any one language for that of their own.

On the other hand there are indications even in unexpected quarters of a desire to conform to modern conditions as regards this matter, for it was nothing less than a revolution for Turkey to agree to the substitution of Roman in the place of Arabic characters for use with the Turkish language.

The writer makes no claim to a profound knowledge of any language, not even his own, but one thing that has impressed itself upon his experience and mind is the frequent failure of one national to catch the *spirit* of another's language. So much has one seen of mere dictionary translation that the illustration from one's own school-days is scarcely an exaggeration, where a young hopeful in all sincerity translated "School Board" into French as "*planche d'école*!"

Truly it is the literalist who causes all the trouble and that in other spheres than those theological.

Even a public school and university training does not apparently correct this defect, for was it not in the diary of a now deceased statesman and Prime Minister that one read: "Had a rather interesting luncheon to-day with Delcasse, Cambon, &c." Then writing of one of the most prominent members of his own Cabinet then present, the diarist proceeds: "X . . . was very eloquent. In the very worst French anyone ever heard. *S'ils savent que nous sommes gens qu'ils peuvent conter sur*, was one of his grand efforts!"

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Quite naturally it is not easy to absorb the *spirit* of another tongue, and here, too, in literary circles, let me say we are occasionally shown how *not* to do it. Thus in a translation from French into English in a work the published price of which is nearly £1, the phrase, "*Mais les lycées ne suffisent pas*," could well have been done into our mother tongue almost as it stood, but was turned into, "But lyceums were too little."

Sometimes it is extremely difficult to catch the exact shade of meaning of a foreign word, and a personal experience on an official pre-war visit abroad, when the word "discreetly" used to an English colleague, was interpreted as "secretly" by the representative of another country who overheard it, is ever-present with me, reminding me of a very bad quarter of an hour which, however, ended happily.

If individuals blunder over translations, entire nations will sometimes fail to check their errors. Witness how glibly the phrase, "the psychological moment" has become current. It is over fifty years old and yet it was left to the compilers of the Oxford Dictionary, not so very long ago, to point out that the phrase as now used simply means nothing! The Germans used *das psychologische moment* in 1870 with moment, as will be seen, in its neuter form. It then means *momentum*! The phrase was translated by the French into *le moment psychologique*, and in that form crossed the Channel, where it was accepted at its face value but actually as what Professor George Gordon now tells us is a "vulgar error."

Language difficulties are typical of the varieties of view-points which may present themselves to the various nationals, even on subjects upon which all concerned are anxious to agree. In the case of the international vocabulary of telegraphic and telephonic terms, already mentioned, it is interesting to note how such points of view may differ even when naming the apparatus, machinery, operations, &c., within the common daily knowledge and in the daily use of all concerned. Thus, "Filament battery," becomes in French "Batterie de chauffage," and in German "Heizfaden batterie," the two latter accentuating the heating feature and the British stressing that of the thread. Take again "Manhole." Here the German engineer accepts the English view and responds with "Mannloch," while our French friends prefer "chambre d'épissurage (splicing chamber), certainly a more descriptive term. "Monkey wrench," says the Britisher, against which in one long word our German colleague replies "Schraubenschlussel" (screw-key). The French engineer attempts no translation other than "English key" (clé anglaise) and leaves it at that!

Will there ever come a time when a single language shall be understood throughout the world? Will the talking film lead to the Americanisation of European and Fijian speech, and will every telegraph and telephone official everywhere know with a certainty that a "trouble shooter" only carries a linesman's kit and is perfectly harmless?

SLOANE AUTOMATIC EXCHANGE.

THE Sloane Automatic Exchange situated in Sedding Street off Sloane Square, is the third Automatic Telephone Exchange to be cut into service by the General Post Office in the London area and has been manufactured and installed for the General Post Office by the Standard Telephones and Cables Limited. This Company is engaged at the present time in the installation of further automatic exchanges in the London area at Langham (which will be known as Welbeck Exchange), Temple Bar, Bermondsey, and Fulham, and these exchanges will form part of the G.P.O. scheme for transforming the London Telephone area to Automatic Working.

In general, the automatic exchange equipment at Sloane is similar to those which have already been installed and put into operation during the last few months at Holborn and Bishopsgate. It has been arranged to cater for an ultimate capacity of 10,000 lines and is at present equipped for 8,400 subscribers; that is, it is capable of being extended by a further group of 1,600 lines when the necessity arises.

The equipment is installed in a typical Post Office building which was utilised to accommodate Sloane Manual Exchange prior to the transfer to Automatic working on July 28.

The automatic plant is arranged on three floors, the first accommodating the Main Distribution Frame, to which are connected the underground cables carrying the lines to the subscribers and the junction lines to other exchanges. This frame also carries the necessary protective equipment to ensure against damage to the plant if by any chance high voltages or heavy currents should be impressed upon any of the incoming lines. On the same floor is another large frame known as the Intermediate Distribution Frame, which serves as a convenient method of cross-connecting the subscribers lines and junctions to the various parts of the automatic plant.

The Test Desk and Power Plant are also situated on the first floor, the former to enable tests to be made of the external cables and the exchange equipment, and the latter as its name implies, provides the necessary electrical power for operating the automatic switches and providing the current required for the proper level of speech transmission.

The major portion of the Automatic Switching apparatus itself is situated on the second floor, but as there is insufficient room on this floor to accommodate all the automatic gear, it was found necessary to erect part of it on the first floor. A further part of the equipment is installed on the third floor and this is known as the Auto-Manual portion and consists of the so-called "A" and "B" switchboards together with the supervisor's desk. The "A" switchboard is for the purpose of handling calls for special services such as calls from Coin Box Stations, complaints, queries and assistance generally to the Sloane subscribers. The "B" switchboard handle incoming calls from manual exchanges, and the operators at this board complete the call by operating press-button keys corresponding to the four digits of the wanted number. This operates the automatic machinery in the Sloane exchange, and extends the calling subscriber to the Sloane number required.

With regard to the Automatic equipment itself, each subscriber's line on the exchange is allotted a special switch called the line switch individual to that line and this switch operates when the subscriber lifts his receiver and connects his telephone to the main automatic equipment and he is advised by hearing the characteristic dial tone that the machinery is ready to receive the electrical impulses which will be sent out when the exchange letters and required number have been dialled.

A special feature of the automatic switching equipment which is being provided for the exchanges in the London area enables the impulses from the dial for the three digits representing the first three letters of the exchange name, to be translated to any combination of from one to six figures as may be determined by the engineers of the General Post Office when designing the exchange. Calls for Sloane Exchange or for other exhanges which are in great demand by the Sloane subscribers are given a simple one or two-digit translation, while those exchanges on which there is not very heavy traffic are allotted the more complicated translations which enable the calls to be piloted through the tandem exchange (which acts as a routing centre for distant exchanges) and from this tandem centre through to the required automatic or manual exchange in the London area. In the case of a call from one Sloane subscriber to another subscriber on the same exchange, the Register Translator, as this special device is called, routes the call to switches in the Sloane building specially allocated to handle this local traffic and when the called party has been selected by these switches, which operate in accordance with the four digits of the required number, the telephone bell of the called party is rung and a signal passed back to the caller indicating this fact.

For calls from a Sloane subscriber to a subscriber on another automatic exchange, the signals from the dial are routed to the Register Translator where they are given a different translation from that used when a local subscriber is wanted, and the call is routed direct or via the tandem exchange to a set of switches situated in the distant exchange. Here it is pioted to the required telephone which is rung and, as in the previous case, the caller is notified by the usual ring-back tone. If a number on a manual exchange is wanted, the Sloane subscriber proceeds in a similar manner to that described above and the call is routed to the distant exchange, where it is received on a manual position, the required number being displayed by a set of lamps in front of an operator, who has merely to complete the call as if it were from a manual exchange.

Calls to exchanges outside the London area must be handled, as at present, through the Toll or Trunk exchanges. For such calls, all the subscriber on Sloane Automatic Exchange will have to do is to dial the first three letters T-O-L for "Toll" or T-R-U for "Trunk," and he is immediatley automatically put into communication with an operator at the Toll or Trunk Exchange, who will deal with his call. In a similar way, a subscriber can transmit by telephone by dialling T-E-L, when the operator dealing with telegrams will immediately give him the desired service.

If any subscriber on an automatic exchange experiences difficulty with a call and requires assistance to complete it, he can obtain help at once by dialling the digit "O" which connects him to one of the operators on the "A" switchboard in his own exchange.

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HELP!

READING the American magazine *Telephone Review* recently, I found an inspiring article giving details of a competition between the different sections—plant, operating, commercial, &c.,—in and around New York, to see which section could obtain the most new orders for extension telephones. There was no prize, apparently, but the whole thing was a labour of love; it was not merely an individual effort, but a section effort, just a desire on the part of everyone to help the service with which they were connected. The results were wonderful and showed with what enthusiasm everyone had entered into the competition. There was evidently none of the "It's not my job," or "What do I get out of it" attitude, but a genuine desire to help to "boost" the section record and the service as a whole.

The result of a two-weeks effort in Manhattan, which is central New York, may be summarised as follows:—

ORDERS OBTAINED FOR EXTENSION TELEPHONES.

Commercial.	*Traffic.*	*Plant.*	*Other Departments.*	
7,213	3,190	3,113	183	13,699

Over Manhattan and two other adjacent areas a grand total of 27,852 additional extensions was obtained! More than half our total net gain in a year in London. Surprising and suggestive, is it not?

How many orders are sent in to the London Contract Branch in a year by the staff of other departments or sections? The total is insignificant, unfortunately. How many of the staff also through whose hands a ceasement passes give a thought as to how the subscriber may be induced to retain the station, and do their part to prevent the waste due to recovery?

You Mr. Traffic Man, and you Miss Operator, you Mr. Engineer, and Mr. Fitter, you Mr. Clerical Officer, and the rest of you, how many orders did you send along last year, I wonder?

Opportunities occur in the course of your duties when it would be easy to suggest an extension telephone, or where you see that an extension would help the subscriber and the Service at the same time.

You, no doubt, feel when you leave your job, whatever it may be, after a strenuous day's work, that you have done enough and want to forget business. Perfectly natural;—we all of us have that feeling, but that same old business has a way of obtruding itself. On the tennis court, or golf links, or river, or football ground, or whatever your hobby or pastime, you can't wholly eliminate the telephone from your actions and thoughts, can you? You hear people talking in the train or tram, or on the playing fields. You know people who make a large use of the kiosks and call offices, or need I say, of their neighbours' telephones, and get only half a service and prove a nuisance to their friends. You see and probably speak every day to people who ought to have telephone service and have not. You know of a case of illness where a telephone would be a Godsend, and nobody has thought of it. You know of a tradesman with whom you or someone you know deals, who has no telephone service, or only an inadequate one. You see cases where there is delay on a line because the person called has to be brought to the telephone; you come across cases where the housewife has to dash up or downstairs at the risk of wind and limb to answer or make a call, and so on.

Without having any competition, would it be too much to ask you to suggest to these, or any of them, that a telephone or an extension would help them in business or at home—to suggest to a tradesman that he would relieve the strain on his service and increase the efficiency of his business by having a P.B.X.—to suggest to an existing subscriber how handy an extension telephone would be—to tell people how wonderfully cheap the service is when its advantages are considered—how favourable its price is when compared with pre-War costs, and so on.

"But I don't know the rates, and wouldn't know how to get an agreement signed," you say. Well, never mind—there are others whose job it is to know these things, and a hint to the Contract Manager is all that is needed. He will see to the rest.

There is another aspect of the question which may not have struck you, but it will interest you, I am sure. This old country of ours is passing through a spell of bad trade. Many people are out of employment and youngsters are growing up daily and are clamouring for jobs. Well, you can help them. An order for telephone service means additional employment for people both outside and inside the Service. The more orders manufacturers get for telephone material the more employment they can give, and every telephone added to the service means more work and more staff in the Contract, Clerical, Engineering, and Traffic Sections.

Will you turn the matter over in your mind, and, as opportunity offers, help? It is not suggested that you should emulate the boy scouts and do one such good deed every day. If each member of the staff were to obtain, or at any rate influence the obtaining of, one telephone a year which would not otherwise come to the Department, think what it would mean—say 15,000 additional telephones in London alone in a year, and twice as many in the Provinces!!

W. F. T.

DEATH OF MR. VINCENT ALSOP.

WE deeply regret to record the passing of Vincent Alsop, who died of pneumonia on Aug. 19, on the eve of his retirement from a position in the service which he had filled so long with such ability and distinction.

Mr. Alsop was born in Devonshire in 1868 and educated at Newton Abbot College and in Germany. He was articled to Mr. Robert Baker of Newton Abbot and admitted a solicitor in 1891. In 1894 he entered the Solicitors' Department of the National Telephone Company and was appointed Assistant Solicitor in 1900. On the transfer of the Company's system to the Post Office in 1911 he entered the Solicitor's Office, retaining the title of Assistant Solicitor. Mr. Alsop's work was chiefly concerned with the telephone side of Post Office work, of which he had unique knowledge and experience. He was one of the most accessible and helpful of officers, and was esteemed and beloved by all who came in touch with him. His colleagues in the Solicitors' Department, in particular, will feel his loss deeply. His many amiable qualities had gained their sincere affection, and he was especially popular with the junior members of the staff, whom he invariably treated with kindness and consideration.

Members of the ex-National Company's staff will never forget his untiring work on their behalf in connexion with the Staff Transfer Association, and as a witness before the Select Committee of 1905. The value to that staff of his activities during those years was incalculable.

The interment, which took place at Fulham New Cemetery, North Sheen, on the 23rd, was attended by Mr. R. W. Woods, Solicitor to the Post Office; Messrs. F. E. Waters and G. S. Stow (representing the Secretary's Office); Messrs. T. E. Tutton and J. P. Leckenby (Investigation Branch); and Messrs. Bostock and Evans, representing the London Telephone Service. Flowers were sent by the Solicitors' Office, the Telephone Branch of the Secretary's Office, the London Telephone Service, and by former colleagues of Mr. Alsop now in the London Telephone Service.

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TELEGRAPHIC MEMORABILIA.

ARGENTINA.—Reuter's Trade Service at Buenos Aires informs us that the Rio de la Plata Telephone & Telegraph Co., of Buenos Aires, is about to extend its wireless telephone system to Santa Fé and Paraná, in Argentina, and to Montevideo, in Uruguay. The Buenos Aires station transmits on a 10,000-metre wave and receives on a wave of 17,629 metres, while the Rosario station is adjusted reversely. A recent test of high-frequency telephone communication between Buenos Aires and Rosario is said to have given highly successful results.

AUSTRALIA.—The Melbourne *Argus* reports that reserved judgment has been delivered in the action brought by Marconi's Wireless Telegraph Co., Ltd., and Amalgamated Wireless (Australasia), Ltd., against David Jones, Ltd., alleging infringement of a Commonwealth patent covering grid leak rectification. The defendants attacked the validity of the patent. The invention was patented by Dr. Irving Langmuir in the United States on Oct. 29, 1913. The Marconi Co. became assignees of Langmuir on Nov. 21, 1919, and in the following year they applied for the grant of Commonwealth letters patent; the patent was granted and dated as of Oct. 29, 1913. The matter was one of the test cases which, under the terms of the recent statutory agreement between the Commonwealth Government and Amalgamated Wireless, Ltd., that company is required to prosecute to determine the validity of a patent. The judge held that the granting of the patent by the Commonwealth to the Marconi Co., as assignees of Langmuir in November, 1923, was invalid, and that the plaintiffs had no right over the invention in the Commonwealth. He ordered the plaintiffs to pay the costs occasioned by the reference to the court.

The Australian Prime Minister, announcing the Commonwealth Government's future policy towards broadcasting, said that it was contemplated that the Government would take over the plant and equipment of all privately-owned "A" class stations, and that provision would be made for the broadcasting of complete programmes of news and entertainment by private contractors after tender, says *The Times*. The contractors would be paid a percentage on each licence fee. The Postmaster-General would be given power to ensure the maintenance of the standard of programmes by withholding part of the licence fees payable, or by cancelling the contract. Investigation and research work would be financed from the balance of licence fees after paying the contractors. An advisory committee would assist the Postmaster-General in all matters requiring expert technical consideration and in the supervision of programmes. Practically all existing broadcasting licences expire next year, when, it is assumed, the new system will become operative.

BELGIUM.—Reuter's Agency at Superior, Wisconsin, reports that Mr. Coolidge has appointed three American representatives to the International Telegraph Conference which is to meet in Brussels on Sept. 10, namely, Mr. C. H. Shedd, of Messrs. Swift & Co., Chicago, Mr. J. Goldhammer, vice-president of the Commercial Cable Co., and the American Minister in Stockholm. The United States, though not a member of the International Telegraph Union, was invited to send representatives to the conference.

CANADA.—Wireless broadcast receiving equipment for passengers will be one of the features of the *Lady Nelson*, the twin-screw steamer which was launched at Birkenhead recently, for the Canadian National Steamships' Canada-West Indies service. Leads will be provided in all public rooms of the ship, and it will be possible to plug in loud-speakers as desired. Similar equipment is to be installed in four more ships which are being built at Birkenhead for the Canada-West Indies service.

A Canadian Commission is to be appointed to inquire into the question of broadcasting. The Commission will visit Great Britain and France to inquire into the working of the national system.

CEYLON.—Amongst Government efforts that are being made to encourage the use of portable wireless sets is the removal of the import duty on privately-owned sets, so that any person may now import a set and possess it for six months without a licence.

CENTRAL AMERICA.—From San Salvador, through Reuter's Trade Agency, we learn that an agreement has been concluded between the three Latin-American Governments of Honduras, Mexico and El Salvador for the establishment of an international telegraph service. The Honduras National Congress has already approved of the measure, and the two other States are expected to record their sanction without delay.

CZECHO-SLOVAKIA.—From official sources we learn the following interesting items regarding tele-communication among the Czechs:—

In 1927 both telegraph and telephone communication was further improved. The telephone department realised a further portion of its programme by the completion of the trunk line between Dresden and Prague. This section was opened in November last by *direct* conversations for the first time with Paris, Copenhagen, Stockholm and The Hague. On the Prague to Budapest section the cable was laid from Jihlava *via* Brno to Bratislava. The year's programme was completed with the laying of 467 kilometres of trunk cable. Arrangements have also been made for extending the trunk lines to meet the proposed Polish lines, connexion to be made in the direction of Brno, Olomouc, and the Polish frontier. Further linking has been arranged for with the German network in the direction of Prague-Plzen-Nuremburg, and in that of Mistek-Cosel. Inter-urban communication in the individual provinces of Czecho-Slovakia has been extended, so that all the more important towns will be linked with the important long-distance cables. At Prague an automatic telephone exchange for 20,000 connexions, at Smichov one for 6,000, and at Vinohrady one also for 6,000 connexions, have been completed. At Zizkov, a new inter-urban telephone exchange for 380 inter-urban lines has been erected. Wireless transmitting stations have been extended, and several added. In respect of broadcasting, an arrangement has been introduced which enables the same programme to be sent out from Prague, Brno and Bratislava.

World Radio adds the following regarding broadcasting conditions in that country:—

In Czecho-Slovakia, where any radio subscriber can give a month's notice at the beginning of any month to terminate his contract, there were recently 226,748 subscribers, of whom 146,070 were in the Prague postal district. Brünn (Brno) came next with 41,790, and Kosnice (Kaschau) was lowest with 3,721. In Austria subscribers can only give notice just before the end of the year. People terminate contracts even when they are only going away for holidays, knowing that they can resume when they like.

DOMINICAN REPUBLIC.—Reuter's Trade Service at Santo Domingo reports that a powerful radio station (call letters HIA-HIZ) has been erected in Santo Domingo, the capital of the Republic, at the mouth of the Ozama River. The station is able to broadcast on a wavelength of 450 metres and preliminary tests have shown that it can be heard in South America and Canada as well as at nearer places.

ESTHONIA.—The *Commercial and Industrial Gazette*, Moscow, reports that the Weak Current Trust has signed a contract for the building of a wireless station at Reval (Esthonia) with a power of 5 kilowatts.

FALKLAND ISLANDS.—The Southern Whaling & Sealing Co., Ltd., is making important additions to the existing Marconi installations of its fleet for the coming season. During the last two seasons good use was made by the whale catchers of the wireless telephones with which they are fitted. The sets are operated by the gunners, and enable the individual ships of the fleet to keep in touch with each other and with their headquarters at South Georgia and the South Shetlands. The *Southern Empress* is the new floating factory ship for the South Shetlands, and will be accompanied by three whale catchers: they will be equipped with telephone sets and direction finders, for fog or snowstorms normally cause considerable delay in whale catching, and there is always a fear of losing the "mother" ship. The *Southern King* is attached to the South Georgia headquarters, carrying out the materials, stores and men for the season, and returning with oil. At the headquarters, a telephone set similar in power to that carried by the whale catchers is installed, but with an additional device that enables it to be used as a telegraph transmitter on the normal wavelength for ships. Four whale catchers are attached to headquarters, each of which carries a wireless telephone. The *Southern King* and *Southern Empress* carry more equipment than the rest of the fleet, because of their different duties; in addition to the telephone equipment, short-wave transmitters are installed to keep the two ships in communication with British Post Office stations from the Antarctic, thus placing them in practically direct communication with their owners. Quenched-spark transmitters for working with other ships and with local coastal stations during the voyage are installed, and also direction-finders. Advantage has been taken of the high amplification factor of screened-grid valves to incorporate two of them in each direction-finder. The result has been to increase the selectivity and sensitivity of the amplifier, with which a fixed-frame aerial system is used.

FRANCE.—The Compagnie Française des Câbles Télégraphiques is paying a dividend of 43.17 fr. per ordinary share out of net profits of 6,161,000 fr. for 1927.

The Compagnie Générale de Télégraphie sans Fil reports net profits of 9,209,000 fr. for 1927. The dividends are 50 fr. per "B" and 25 fr. per "A" share.

The annual French Radio Exhibition is to be held in the Grand Palais, Paris, from Oct. 25 to Nov. 4 next as part of the Motor Cycle and Cycle Show. The exhibitors will be limited to members of the Syndicat Professionel des Industries Radioélectriques.

An electrical depth-sounding instrument which indicates the depth of the sea, and records, by means of different coloured lights, whether the vessel is passing over rocky or sandy ground, was included in the apparatus carried by the French trawler *Wagram* which arrived at Fleetwood last week.

GERMANY.—The *Wireless Trader* says that Germany's exports of radio apparatus during 1927 amounted to £2,099,000, as compared with £1,580,000 in 1926. This is the highest figure yet reached by any country and puts Germany in front of the United States in this trade.

The number of subscribers to the German broadcasting service increased during the second quarter of the year by 49,576; the total on July 1 was 2,284,248.

The Exchange Telegraph Agency reports that, due to the frequent disturbances in the Prussian diet, "a microphone with 75,000 times intensifying power is now being installed before the President's desk, and is connected with a loudspeaker, which, it is hoped, will enable the President's ruling to be heard above the greatest uproar.

A similar contrivance is being provided at the desk from which orations are delivered, so that it will not be possible to howl down the member who has the floor."

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GREAT BRITAIN.—*Parliamentary items.*—Mr. Kelly, on July 24, asked the Postmaster-General if he would state why the Engineering Department of the Post Office had suggested to manufacturers of telephone cable in Liverpool and elsewhere that they should temporarily close down this section of their factories and disband their staffs. Sir W. Mitchell-Thomson said that no such suggestion had been made by the Post Office. It was, however, true that development would be, for the present, more in the direction of local lines than of main cables, and consequently the demand for those cables would be smaller.

A propos of this is the report of the *Liverpool Post*, which states that an official of the British Insulated Cables, Ltd., Prescot, stated recently that unless that company could obtain a big increase of foreign orders the drastic cuts in the P.O. programme would mean that 2,000 workers would be out of employment in Prescot alone. "The telephone cable-making industry throughout the country will be seriously affected," he said, "and will result in about 20,000 being thrown out."

Yet another phase of this question is referred to in the second report of the Selective Committee on Estimates to the House of Commons, to the effect that the total value of the stores purchased by the British Post Office is at present about £5,000,000 per annum. To give preference to British manufacturers, foreign tenders are *not* invited, except when the articles required cannot be obtained at a reasonable price in this country. The report states that the manufacture of cables is, with the exception of two firms, in the hands of the Cable Manufacturers' Association, from whom the Post Office buys about 80% of its total requirements, which amount to £1,000,000 per annum. The cables could be obtained from foreign manufacturers at considerably lower prices. The Committee are of opinion that the Post Office should have a free hand to accept tenders from abroad in cases where it is unable to obtain satisfactory evidence that the prices quoted by British manufacturers are not excessive.

Further references to both the telegraph and telephone services are made in Appendix I of the same report, comparing the business done by the Post Office in 1913-14 with the years 1924-25, 1925-26 and 1926-27, showing the following financial results after charging interest on capital and allowing for depreciation of plant, buildings, &c. :—

Telegraph Service.—

Deficit for the year 1913-14	£1,211,742
Deficit for the year 1926-27	1,436,690
Estimated deficit for the year 1927-28 ...	1,519,000

Telephone Service.—

Surplus for the year 1913-14	239,111
Surplus for the year 1926-27	284,074
Estimated surplus for the year 1927-28 ...	200,000

The telephone service is developing rapidly: the capital expended, which was about £29,600,000 in 1914, had increased to £99,700,000 by 1927. The surplus for 1913-14, after providing for interest and depreciation, was £239,111, and for 1926-27 £284,000, and the estimated surplus for 1927-28 was stated to be £200,000, or one-fifth of 1% on the capital expended. The Committee notes that according to the statement of the Postmaster-General in the House on June 12, the figure for 1927-28 is now estimated to be £120,000 only, or less than one-eighth of 1% on the capital. Of the surplus of £284,000 in 1926-27, £103,802 came from the Continental telephone services. Over 1,000 rural exchanges have been put up in the last five years. A proportion of the rural exchanges is unremunerative, and the estimated total net loss on this class of business is £40,000 a year. The policy on which the telephone service is being administered is to run it as near as possible to cost price; so long as this policy is continued, the Committee considers that caution should be exercised to avoid the small surplus shown by the home telephone service being converted into a loss, and recommends that this point should be carefully kept in view.

As the issue of the Hardman Lever Report on Inland Telegraphs was so very recent, the Committee naturally does not comment on the telegraph service.

Telephone capital has been provided by loans, but the necessity of obtaining a vote for postal and telegraph buildings results in the relegation of their commencement into the worst months of the year; if all such buildings could be charged on the loan account, economy would result. The Committee is of the opinion that all capital required by the Post Office should be obtained on a single principle, and it recommends that the same course should be adopted for postal and telegraph capital as for telephone capital.

On Aug. 3, Mr. W. Baker raised the question of the report of the Imperial Wireless and Cable Conference, and a number of attacks were made upon the interests concerned.

Sir John Gilmour, replying for the Government, said that whatever might be the success of the beam wireless, it had not attained either that measure of continuity of service or of secrecy which was essential to the Empire as a whole. The report came before the House after very long considerations of the problem by a body consisting of men representing a great variety of views, so far as the Dominions were concerned, some of them having to make a measure of sacrifice to attain a common purpose, and the Government having to make also the major sacrifice in order to obtain unity of purpose. This was an Empire bargain, in which they all had to take their common share and common responsibility. In so far as any sacrifice was made, it was not a sacrifice without ultimate repayment, in attaining, as he believed they would attain under the scheme, a measure of security, of secrecy, and of improvement in the commercial enterprise between the various parts of the Empire. The bargain that had been driven was a good one for the State. What were needed in the interests of the public were cheapness and efficiency. It was an established fact that, at the present time, wireless would not wholly supersede cables for all classes of traffic, and for some years to come cables would be necessary. The greatest use and benefit would be derived, in the opinion of the Conference, from the combination of the wireless and cable services, acting as a complement one to the other. The Government had decided to accept the report and to put its recommendations into effect. In doing so it felt that it was acting in the best interests of the public generally, and of the users of the services in particular. It was proposed to enter forthwith into negotiations with the companies concerned with a view to drawing up a formal agreement on the lines recommended by the Conference.

Written Replies.—In a written reply to a question in the House of Commons, Sir William Mitchell-Thomson, Postmaster-General, stated that on the basis of current earnings, the gross receipts of the Post Office from the Imperial "beam" wireless services might be put at about £470,000 a year, and the credit balance before charging depreciation or interest on capital, at about £212,000 a year. The corresponding figures for the Imperial cables were about £143,000 and about £3,000. The Pacific Cable Board was not within his sphere of responsibility, but he understood that in the year ended March 31 last the gross receipts of the Pacific cables were £397,730 and the credit balance (before deductions for interest, capital repayment and allocation to reserve) amounted to £129,852.

In similar manner Sir William answered a question regarding telephone boxes, stating that the number of telephone call boxes in December, 1926, was 21,493, while in March, 1928, they totalled 24,054. The receipts from call offices for the year ended December, 1926, was £881,100, the amount received for the year ended March, 1928, being £953,400.

The two following items were also dealt with in the House of Commons :—

A proposal by the Scottish Board of Health to have wireless telephone apparatus provided for communication between Foula and the mainland of Zetland for medical purposes is not being proceeded with at present owing to the expense involved.

The Postmaster-General has installed experimental short-range wireless telephone apparatus between islands in the Channel Island group for the purpose of testing its efficiency for Post Office purposes.

The Postmaster-General also announced through the usual official channels and the Press, that in future any "Reply Paid" telegram from Great Britain or Northern Ireland to an address in the Irish Free State will be charged an additional 6*d.* for the reply. The minimum for a prepaid reply will thus be 1*s.* 6*d.* for 12 words, and the maximum 4*s.* 6*d.* for 48 words.

The Board of Trade has referred to the Standing Committee under the Merchandise Marks Act, 1926, an application for an Order-in-Council requiring the marking with an indication of origin of imported wireless receiving sets and components. The date of the public inquiry will be announced later, and communications regarding it should be addressed to the Secretary, Mr. E. W. Reardon, Board of Trade, Great George Street, S.W.1, not later than Aug. 24.

To Our Advertisers.—The following tenders are open until the dates specified. Where not otherwise stated, application should be made to the Department of Overseas Trade, London, quoting references where such are given :—

Ministry of Public Works, Cairo, October 1.—Supply and delivery of 250 ornamental electric lamp standards to support electric public clocks, with necessary accessories. (Reference B.X. 4635.)

Postmaster-General's Department, Melbourne, Oct. 2.—Supply of switchboard cords (schedule C. 349). (Reference B.X. 4621.)

Egyptian Posts and Telegraphs, Oct. 3.—Telephone trunk cable from Cairo to Alexandria. Specifications from Chief Inspecting Engineer, Queen Anne's Chambers, Westminster, London, S.W.1.

Postmaster-General's Department, Melbourne, Oct. 16.—Register coils and mounting plates (contract S.28/543; schedule C. 356). (Reference B.X. 4639.)

New Zealand Public Works Department, Oct. 30. Protective relay system. (Reference B.X. 4573.)

Postmaster-General's Department, Melbourne, Nov. 6.—Automatic telephone switching equipment (schedule C. 353). (Reference B.X. 4638.)

Barrowford.—Yet another Radio "Exchange" has been opened. This at Barrowford, near Burnley, where the township is now enjoying community programmes due, it is understood, to the enterprise of Mr. N. Plunkett. A 10-valve set has been installed at the distributing station, and the telephone authorities are said to have run lead-covered wires from the station to the houses, where the only requirement is an efficient loudspeaker. The householder can "plug in" for London, Manchester, or Daventry programmes.

Swansea.—The first delivery of five trawlers out of 25 for the Consolidated Fisheries, Ltd., as an addition to its Swansea fleet, will shortly be commissioned, and they are to be equipped with Marconi radio apparatus somewhat similar to that with which the present Swansea fleet is fitted. The transmitters will be of the 0.25-kw. quenched-spark type, which is of sturdy construction and compact. The two-valve receivers can be tuned to all the wavelengths in commercial use from 300 to 25,000 metres. A modified form of direction-finding receiver has been adapted to the requirements of smaller vessels; a

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powerful amplifier is used with a small frame aerial contained in a water-tight box, and the amplifier covers two ranges of wavelengths (170 to 240 metres and 600 to 1,100 metres) enabling approximate bearings to be taken of other ships, coastal stations, and the beacon transmitting stations.

Eliminators Again!—It is understood, says *The Electrical Review*, that the Westminster Electric Supply Corporation, Ltd., London, has issued a circular notice to the effect that "no authorisation has been given for the use of its lighting or power circuits in connexion with wireless sets. In the event of the Corporation desiring to change the supply to any premises from d.c. to a.c., it will not pay the cost of making any necessary changes to wireless sets so connected."

Private Companies.—A dividend of the Anglo-American Telegraph Co., Ltd., of £1 10*s.* per cent. has been declared on the preferred stock and one of 15*s.* per cent. on the ordinary stock for the quarter ended June 30.

The earnings report of the Western Union Telegraph Co. for the first half of the current year shows gross revenues of $67,066,225, as compared with $65,961,326 for the first six months of 1927. After deducting expenses and interest on bonded debt, there is a net income of $7,278,705, against $7,322,086.

The dividends in respect of the half-year ended June 30 of the Cable, Telephone and General Trust, Ltd., have been declared on the 6% cumulative and 7% non-cumulative preference shares.

Marconi's Wireless Telegraph Co., Ltd.—The City notes of *The Electrical Review* of Aug. 10 last, give the following interesting information: "In a reply to an inquirer the company stated last week that there was some misapprehension as to the nature of the scheme for a merger between the company and the Eastern and Associated Cable Companies. The merger proposals do not provide for the liquidation either of the cable companies or of the Marconi Company, and the rights of the holders of the different classes of shares in the Marconi Company in a liquidation or winding-up do not come into question. It is hoped to form the merger company as soon as the necessary legal formalities can be carried out, which must necessarily occupy some time. An offer will then be made by that company to the shareholders of the cable companies and the Marconi Company to acquire their shares in exchange for shares in the merger company. The capital of the merger company which has been allocated to the cable companies will be offered to the shareholders in those companies, and the capital allocated to the Marconi Company will be offered to the Marconi shareholders. It will be necessary for the Marconi board, in due course, to prepare a scheme defining the terms upon which the shares in the merger company will be offered to the holders of the different classes of shares in the Marconi Company. Those terms have not yet been finally settled, and the offer cannot be made until the merger company has been formed, but it is the intention of the Board that the offer of the exchange of shares shall be made not on the basis of a liquidation or winding-up, but shall be such as the board considers fair and equitable as between the different classes of shareholders."

The 97th Ordinary General Meeting of the Eastern Telegraph Co., Ltd., was presided over by Sir John Denison-Pender on July 24, and with pardonable pride the chairman briefly reviewed the history of a period which nearly covers a century of telegraphy.

One therefore makes no apology for occupying space with the following much-abridged report of Sir John's speech at that gathering: "The direct circuit between London and Bombay is awaiting the completion of the underground lines between Suez and Port Said; that was expected within the next few weeks. Then, with the two new cables laid between Alexandria and Port Said during the year, the regenerator should be working between Electra House and Bombay. [Direct telegraphic touch with India was obtained from Electra House on the 27th ult.—ED., *T. & T. Jl.*] These and other improvements had resulted in greater speed and efficiency with a smaller staff. Palestine had now been joined up with the main line system, via Cyprus. The Turkish concession had been duly ratified, and direct communication with Turkey was re-established in November last. Further reductions had been made in the rates to South Africa and India, in addition to those in the Australian and New Zealand rates made in the preceding year. They had closed unremunerative stations and proposed to dispense with two cable ships in the interests of economy. The company's policy of so many years of reasonable dividends and of building up the reserves had enabled them to consistently reduce their rates. In 1902 they first encountered Government competition, and last year the 'beam' radio system was established for communication with Australia, South Africa, and India. In spite of that the company continued to carry more traffic than the radio system, and it was clear that the cables still held a definite and important position in the world's communications. At the same time, they could not afford to lose the traffic which the cheaper radio service was taking from them. In anticipation of a satisfactory conclusion to the merger negotiations, and in order to complete the scheme, they had purchased the controlling interest in the Direct West India Cable Co., which, in turn, controlled the Cuba Submarine Telegraph Co., the Halifax & Bermudas Cable Co., and the West India and Panama Telegraph Co. The group owned 8,000 miles of cable, 22 cable stations, and two wireless stations. Those companies would eventually be brought in under the merger, and so complete the whole system of cables and radio in the West Indies, both owned and controlled by the British Government or by British companies. In conclusion, Sir John said that if the anxious time through which they had passed resulted in the formation of a merger company, comprising the whole of the overseas telegraphic communications of the Empire, while maintaining connexion with foreign countries, with suitable protection for the public in the matter of rates, and a reasonable return on the invested money, coupled with an unsurpassed mobility and efficiency, one of the greatest advances in British commercial enterprise would have been achieved."

The companies mentioned, it may be added, have important agreements, so it is understood, for the exchange of traffic with the Commercial Cable Company and the Western Union systems.

The financial conditions of the purchase of this group are not yet known, but the following history as recorded by the *Daily Telegraph*, in its issue of July 23 last, is as informative as it is interesting: "The Direct West India has now a paid-up capital of £197,873, and was formed in 1897 to carry out an agreement between the Government and the Halifax and Bermudas Cable Company for the laying and working of a cable from Bermuda to Jamaica via Turk's Island. The British Government subsidy of £8,000 p.a. expired in 1918. Last year the Direct West India acquired control of the Cuba Submarine Telegraph Company, paying £7 per share for each £10 share of the nominal amount of £157,060, and £10 for each share of that denomination for £59,820 preference shares. The Cuba Submarine dates back to 1870, and in its turn controls the West India and Panama Telegraph Company. The capital of the Cuba Submarine amounts to £160,000 in ordinary shares and £60,000 in 10% cumulative preference. The Halifax and Bermudas has £50,000 in £5 shares, and the West India and Panama £1,275,530 as to £345,630 in 6% first preference, £46,690 in second preference, and £883,210 in ordinary shares." The London addresses of the above-mentioned companies are now transferred to Electra House, London.

The financial aspect of the "merger" as a whole, is perhaps best expressed in the words of *The Electrical Review* which, while in an ordinary leaderette declaring that, "All the Dominions approved the proposals in principle, although some of them, South Africa for instance, considers that State control of the combined services should be assured, while Canada and Australia call for the clarification or amplification of some details," nevertheless expresses every confidence that these details would not be likely to prove any real stumbling-block in the path of whatever negotiation and discussion may still be necessary.

Writes also the financial editor of our able contemporary: "Shareholders in the cable companies deserve to be congratulated upon the outcome of negotiations which might easily have gone agley. The fact of Eastern ordinary having been down, at one time this year, to 140, against the present quotation of 250, is in itself a testimony to the uncertainty which was felt, not unmixed with nervousness in regard to the outlook of the cable companies, *vis-a-vis* the competition which was being so successfully carried on by the wireless and beam systems. The cable companies have been in existence for more than half a century, and shareholders must feel very thankful to think that events have turned out so propitiously for their interests."

The *Review* says it has only one criticism "of a scheme which is an achievement of the highest order" and that is—what? "That it leaves the external telephone services of this country in the hands of the Post Office." *Verb. Sap.*

The B.B.C. announces that the contract for the buildings for the new London regional station near Potters Bar has been awarded by the Board of Governors to the Anglo-Scottish Construction Company, in competition with several other large contracting firms, and work has started. The design for the building was prepared by Messrs. Wimperis, Simpson and Guthrie, and the specification by the Corporation's engineers, who will directly supervise the construction of the building.

The latest list of exhibitors at the National Radio Exhibition, which is to be held from Sept. 22 to 29, at the New Hall, Olympia, London, makes a brave show. The newest newcomer, so far as the writer can trace, is that of the Baird Television Development Co., Ltd., which has taken stands numbers 11, 13, and 14.

Despite the "halt in cable stocks" recorded as these lines are being written, the following paragraph should cheer up the pessimists who talk of the obsolescence of submarine cable telegraphy: What will be, it is claimed, the world's fastest submarine telegraph cable is to be laid for the Western Union Company by the cable ship *Dominia*, belonging to the Telegraph Construction and Maintenance Company, which sailed from Greenwich on Aug. 7 for Horta, Fayal, Azores. When the survey of the route has been completed at Bay Roberts, Newfoundland, *Dominia* will begin the laying operation in the latter part of August, and it will be completed on or before Sept. 10, thus opening a new channel of communication between North America and Germany, Italy and Africa. The new cable will represent an advance in ocean telegraph engineering. It will make possible the simultaneous transmission of five messages in each direction, ten messages in all, over the cable between Bay Roberts and Horta, whence eastbound traffic will be divided and routed over cables to Germany, Italy and Africa.

It is equally interesting and satisfactory to read in the electrical press that experiments were recently carried out aboard the Cunard Co.'s liner *Mauretania* by Dr. D. D. F. McIntyre, a Board of Trade medical inspector, in co-operation with Dr. H. C. Case and Dr. P. Morton, in connexion with a scheme for the establishment of an international medical marine radio code to enable ships' captains to communicate diagnoses to other vessels, with a view to affording medical assistance to people at sea on vessels not carrying surgeons. The scheme is the work of the British Medical Association's special committee which was formed a year ago, and representatives of the Admiralty, the Board of Trade, the Ministry of Health, the steamship companies, and the Post Office have all combined to produce a code that can be extended for international use.

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GOLD COAST.—The *Board of Trade Journal* shows that during February last, the value of electrical and telegraphic apparatus imported into the Gold Coast Colony was £10,526, against £3,013 in February, 1927.

HUNGARY.—*The Electrical Review* reports that a Railway Broadcasting Company has recently been formed in Budapest for the purpose of providing loudspeaking broadcast receiving apparatus in railway station waiting rooms.

INDIA.—It is understood that the British Broadcasting Corporation has agreed to co-operate technically with the Indian Broadcasting Company. As a preliminary step it has commenced to relay the London programme from 5SW once a fortnight at a time specially suited to the needs of Indian listeners.

KENYA COLONY.—The British East African Broadcasting Company's Nairobi station operates on a wavelength of 90 metres; its power is approximately 4 kw.

NICARAGUA.—Reuter's Trade Service at Managua, reports that a concession has been granted to the Tropical Radio Company, a Boston concern associated with the United Fruit Company, for the erection of a radio station at Puerto Cabezas.

NORTH AFRICA.—It was announced last week that the Algiers station had changed its wavelength from 304 to 353 metres.

PERSIA.—The *Board of Trade Journal*, dated July 19, contained a translation of the new Persian Customs tariff which was approved on May 3. This shows the minimum and maximum duties; British goods receive the benefit of the minimum rates. Among the goods affected are machines and apparatus (including generators, &c.), telephone and telegraph apparatus, electric lamps, scientific instruments, &c.

PORTUGAL.—The British Vice-Consul at Lisbon, Mr. Leonard H. Leach, has prepared an interesting report on the present conditions in Portugal, due mention being made of tele-communication in that country. He says that the "beam" radio station of Monsanto has been in operation for a year, and stations have been erected at the Azores, Madeira, Cape Verde Islands, Loando and Lourenço Marques. The Portuguese system is directly linked up with the other main radio systems, and so is available for communication with all parts of the world. The operating company, the Cia. Portuguesa Radio Marconi, which is affiliated with the British Marconi Co., was formed in 1925 to take over from the Portuguese Government the concession for international radio communication for Portugal for a period of 40 years. In January last a contract was signed between the Government and the Anglo-Portuguese Telephone Co. for a renewal of that company's concession for the telephone systems in Lisbon and Oporto. The contract covers a minimum period of 40 years with the possibility of extension to 75 years. The Government has under consideration proposals by other interests to take over the Government telephone system and develop the service throughout the whole of Portugal.

RUSSIA.—Reuter's Trade Service, Moscow, states that broadcast radio-telephone stations in service, or in course of construction, at the beginning of 1928 in Russia numbered 64. The wavelengths used range from 60.12 to 1,700 metres, 10 stations using 1,000 m. or over, while the power employed ranges from 0.02 to 40 kw.

The Kazitsky factory at Leningrad has completed a combined 25-kw. radio-telephone broadcasting station which can also work as a radio-telegraph station, with a power of 35 kw. The plant was tested in the presence of a special commission of the Commissariat of Posts and Telegraphs, and the results are said to have been excellent. This type of station has been adopted by the Commissariat of Posts and Telegraphs as the standard type for use in the Soviet Union.

SWEDEN.—The following information, extracted from the statistical report of the Swedish Telegraph Department for 1927, has been received by the Department of Overseas Trade from the Commercial Secretary at Stockholm (Mr. W. Peters): At the end of 1927 there were seven broadcasting stations belonging to the telegraph service, with an average yearly service of 2,043 hours per station, and 24 smaller private relay stations. The big Motala station was put into operation in the middle of 1927. The stations at Gothenburg and Malmö are to be enlarged to 10 kw. The licence fee is Kr. 10. The number of licences granted at the end of the year for receiving apparatus was 328,133, or 53.9 per 1,000 inhabitants, as against 242,559 and 39.9, respectively, at the end of 1926. Stockholm 56,931, or 90.5 per 1,000 inhabitants (80.0 in 1926): Gothenburg 29,051, or 77.4 per 1,000 (81.6); and Malmö 16,703, or 98.7 per 1,000 (101.9).

The Crown Prince of Sweden, on July 24, declared open, at Stockholm Concert House, the second International Congress of Radiology. Some 1,200 delegates from all parts of the world were present, including 80 English scientists, says *The Electrical Review*. The King received all the delegates at the Royal Palace. The most important items on the agenda of the Congress are the British recommendations for X-ray protection and for the accurate estimation of doses of radium for therapeutic purposes. An exhibition of apparatus was held at Lillievalchs Exhibition Hall, in which many British manufacturers of X-ray and radiological apparatus took part. This is the first occasion on which it has been possible for British manufacturers to show their products on a large scale abroad.

SWITZERLAND.—The London *Times* says that the original proposal for a purely League radio station on neutral territory has been reconsidered, and a special committee formed to analyse the situation will submit to the council, alongside the original proposal, a new one whereby, instead of the League being saddled with the definite initial expenses and the problematical working expenses of a station of its own, the acceptance is recommended of the offer of Radio-Suisse (a commercial wireless organisation in which the Swiss Government is largely interested, now operating the Berne station) to construct in the Canton of Geneva a special wireless telegraph station equipped with the latest appliances, which will be placed at the service of the League in times of crisis.

A wireless telephone service has been opened between Switzerland and North America, says the *Electrician*.

The *Daily Telegraph* recently published an interesting report in its City Article on the Finances of Switzerland during 1927. The following is excerpted from the same and is based on the Accounts of the Swiss Confederation for last year, commenting on which the editor says: "On the whole, the various Federal services are improved since 1920, and for 1927 they yielded a net surplus of 5,920,000f, in comparison with 5,504,000f in the previous year. The combined result of the working of the telephone and telegraph services for 1927 was an excess of revenue over expenditure of 30,953,000f, against 30,114,000f in 1926, the net result being a profit of 2,599,000f, against 1,993,000f. It is not without interest to note from an analysis of the figures that, apparently, while the telephone service alone could show a surplus of 4,283,000f, the telegraphs suffered from their competition and showed a loss of 1,684,000f. This deficit, however, represents a decided improvement on the previous year, when there was an adverse balance of 2,312,000f. After remarking that it now remains to be seen whether a reduction of postal and other charges cannot be secured, the writer of the bulletin sounds a note of warning to the Swiss Government lest they should be carried away by the existence of a surplus, and give in to the pressure which will certainly be brought to bear upon them with a view to securing additional expenditure."

All aeroplanes fitted with wireless apparatus have now been assigned five-letter call signs by the International Bureau at Berne. The first letter is the nationality designation, and the remaining four letters are the registration mark of the aircraft. In the case of several countries having the same nationality prefix, the first letter of the group of four letters also signifies nationality. Thus, Haiti begins its four-letter group with H, Holland with N, &c., so that a Dutch plane would be registered H-NADY. British aeroplanes carry the prefix G, and the general call for all R.A.F. machines is G-EZAA.

U.S.A.—The U.S. Commissioner of Patents recently rejected an application for a patent on a variable condenser with plates shaped to give a straight-line frequency effect, says the *Wireless World*, on the ground that it "lacked the dignity of an invention." The decision was sustained by the Supreme Court.

Realisation of a fact, says *The Electrical Review*, that has been appreciated in this country all along, but which is described in America as "a somewhat startling discovery," striking at the foundations of the present system of broadcasting in America, has been made by the John Wanamaker store, which was the pioneer broadcaster in Philadelphia. "Investigations made by a special inquiry among radio listeners during the past two years," runs a statement by that firm, "having revealed that broadcasting is not helping the store in general or in an advertising way," the Corporation has accordingly closed down broadcasting station WOO, Philadelphia, which has been "on the air" ever since 1922. It is extremely unlikely that WOO will ever be heard again, declares the *Wireless World*. The opinion appears to be growing that many other broadcasting interests would reach similar conclusions if they carried out investigations. The American public may well hope that the question will be allowed to drop, for practically all their broadcast entertainment is provided by firms seeking advertisement.

In its issue of July 20, the *Electrician* gave a review of the Radio Industry in the U.S.A., according to which the year 1927 was one of heavy losses. "Of some 2,500 producers engaged in the trade this time last year only 1,200 remain! The elimination, continues the review, "has done much to improve the position of the industry as a whole."

"The industry, generally considered, has recently been benefiting also from a larger public demand for wireless receiving sets and accessories than is usually experienced at this season. The total value of retail radio sales, after expanding from only $60,000,000 in 1922 to slightly more than $500,000,000 in 1926, declined to $446,000,000 last year—a drop, as compared with 1926, of 11%. During the early weeks of 1928, trade continued at a lower rate than in the corresponding period of the preceding year, but afterwards for several months was substantially heavier than in the corresponding portion of 1927.

"Moreover, although sales have lately been declining in accordance with seasonal influences, they continue to make a better showing than they did a year ago. Reports from ten of the principal retail markets indicate that although all sections are not participating in the increased buying, the gains are, nevertheless, rather widely distributed. Dealers in seven cities state that business is more active this year than last, while in two centres only is trade falling under its 1927 volume. It is equally significant that retailers view with optimism the prospect for business during the late spring and summer."

A new radio patent, which is said to cover features found in all types of broadcast receivers now manufactured for general sale, has been announced by Mr. Edward H. Loftin, co-inventor with Mr. William F. Grimes. The serial number is 1,675,186 of June 26, 1928, and the patent has been assigned to Mr. Loftin as trustee. "The claims allowed by the United States Patent Office are extremely broad," according to the *T. & T. Age*, "for a principle that has proved essential to efficient amplification in tuned radio-

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frequency receivers capable of bringing in distant stations." The application for the system is said to have been filed with the Patent Office more than five years ago.

Is this another Merger ?—Prevented by law from combining with the Radio Corporation of America to form one trust, the International Telephone and Telegraph Corporation is reported to have formed two new companies designed to meet foreign competition. The two new subsidiaries, called International Communications Corporation and International Cables Corporation, with nominal capitalisation, have broad powers to operate, own, lease and construct cables, telephone lines, radio-broadcasting stations, television apparatus, telegraph and radio-telegraph systems throughout the world. It is suggested that the company may be laying the ground work for a communications merger in case the repeal of the White Act, which forbids mergers of wireless with cable companies, can be obtained. It is learned also that the International Telegraph and Telephone Co. has concluded a contract with the Western Union Telegraph Co., whereby the latter is granted the use of the International Co.'s wire systems, paving the way for the eventual elimination of equipment duplication. It has also contracted to lease to the Western Union Co. apparatus developed in the International Co.'s laboratories, thereby enlarging the capacity of the Western Union's present equipment. Similar contracts are available to other telegraph companies.

General and Personal.—Sincerest congratulations to Mr. H. L. Dent upon his promotion from Higher Clerical Officer in the C.T.O. to Staff Officer in the same department.

To Miss H. E. Wallis, Chief Supervisor of the C.T.O., the heartiest of good wishes for a long and happy retirement. As the first to hold this recently-authorised administrative position in the C.T.O., Miss Wallis has fixed a standard of efficiency difficult indeed for her successor to attain, and therefore no idle compliment to Miss G. Hall who takes her place.

The very best wishes also go out to Mr. W. R. Jones, Overseer, Cable Room, C.T.O., upon his retirement, which it is hoped that, together with his good wife, he may live long and healthily to enjoy. Mr. Jones first saw telegraph service in the late Submarine Telegraph Company, which was "merged" into the Post Office Telegraph System in 1889 and is one of the gradually diminishing number of officers thus transferred.

The writer of these paragraphs had wished to "let himself go" this month somewhat on Television, but the Parliamentary items, as will have been noted, are so numerous and lengthy that little, if any, space is likely to be found for much on the subject. In any case, curtailing as far as possible, an endeavour will be made to put our readers up to date with matters as they stand at the end of August, especially in view of what may happen when the Radio Exhibition opens at Olympia. There has been quite a flood-tide of information, of varying quality, let it be said, with a certain amount of scepticism regarding the acclaimed fact that "*moving* pictures had been successfully transmitted over lengthy distances," besides which a natural amount of confusion had also been caused between the transmission of "still-life" pictures and that of "moving figures."

On Aug. 3 the London Press published a message from Berlin, one journal heading the paragraphs "Television Solved," which read in effect thus :—

That Prof. Karolus, the physicist of Leipzig University, has actually solved the problem of television is the claim seriously put forward by this evening's Berlin papers.

"Within a forseeable time," says the *Vossische Zeitung*, which gives the fullest account of his apparatus, "we shall have in the house, alongside the radio receiver, the telephotographic apparatus, so that it will be possible to transmit simultaneously the scene and music of an opera."

An expert in telephotography, who witnessed the working of the Karolus device when it was running far short of full power and transmitting per second only eight pictures of 8,000 light points each, stated that he received "absolutely the illusion of movement, though indeed, somewhat angular and jerky, as in the case of a slowly running film." The pictures were "clear and recognisable, the face of each separate actor being easy to identify.

That, however, was with eight pictures per second, and it is claimed that the apparatus has now been improved to a point at which it can transmit twelve. According to the paper already quoted, the complete apparatus will from the outset cost not more than from £50 to £75. Its cheapest constituent will be the "Karolus cell," which, at the same time, is its essential novelty. This electric light relay, from which, it is asserted, the element of inertia has been completely eliminated, is filled with nitro-benzol, and varies its penetrability for light according to the fluctuations of the current from the transmitter.

Later the B.B.C. informed the Press that it had not been found feasible to plan a television service for the near future, but stated that there might be some development in the matter before Christmas. "We have definitely decided not to proceed with the Baird home apparatus scheme," an official explained, "but we have carried out several tests with the Fultograph, which transmits photographs by wireless (i.e. still life pictures). Nothing, however, has been decided upon."

On Aug. 9 or 10 the special New York correspondents of the *Daily News* and *Daily Telegraph*, of which the following is the more succinct account, cabled as follows :—

"Cinema pictures were successfully transmitted by radio yesterday from the Westinghouse factory in Pittsburgh to a receiving station two miles distant. Officials of the company and a group of scientists who had assembled to witness the demonstration confidently predicted that in a few months radio cinema pictures would be a commonplace, and be broadcast daily throughout the United States.

"In yesterday's experiments pictures were sent through the air at the rate of sixteen per second. They were picked up on the receiving instrument with only slight defects, and thrown on the screen as clearly as the usual newspaper half-tone illustration."

Prior to this by about a week, the alleged improvement on the English and American systems of television, mentioned above, was announced from Leipzig, where Professor Karolus, whose method of sending still-life pictures by wireless was patented by the Telefunken Company of Berlin, and is now in use in several printing works in England, has been experimenting for some months.

The cost of his apparatus, which, it is said, will enable film pictures to be projected upon a screen in every home, and to be used with an ordinary wireless set, is between £50 and £70.

About the same date the wireless correspondent of the *Daily Telegraph* wrote :—

"It is now fairly certain that the B.B.C. will this autumn start the transmission of still pictures receivable in the home. This must not be confused with television, or the transmission and reception by wireless of moving pictures.

"Important experiments have already taken place in the broadcasting from 5XX, the senior Daventry, of photographs and drawings. These may be reproduced on apparatus with a small rotating cylinder on which the picture is traced.

It was also definitely stated during the second week of last month, and demonstrated to certain members of the Press by Mr. J. L. Baird, that "*Stereoscopic* television pictures" were now an actual fact.

The writer has very good reason for anticipating an early success, not only with *daylight* photographic television, but also of another development, viz., in the direction of coloured televised pictures.

The 1928 Sports gathering of the Cable Room Staff at Wembley was a complete success, despite the usual christening by Jupiter Pluvius. What strikes one as the happiest feature of this function is the "family" element, so many junior representatives down to the tiniest toddler being present at the gathering. Happy youngsters ! You *all* received prizes whether you came in first or last, so amply did the kind-hearted Committee fill the prize table !

The articles which recently appeared in *The Times Engineering Supplement* from the pen of Mr. John Lee, and entitled "Letters to an Absentee Director," have now been published in book form by Messrs. Isaac Pitman & Sons.

IDLENESS : An idle life is death anticipated.—*Goethe.*

J. J. T.

PRESENTATION TO MR. G. F. FINDLEY.

To mark Mr. G. F. Findley's departure from the Headquarters Telegraph and Telephone Traffic Section to take up the position of Traffic Superintendent, Class II, in the North Midland Telephone District, a large gathering was held at General Post Office North on July 16, when the Chief Inspector, Mr. J. F. Edmonds, on behalf of the members of the Traffic Section, presented Mr. Findley with a mahogany striking clock and a Jacobean canteen of Sheffield cutlery.

In appropriate terms the Chief Inspector referred to Mr. Findley's long experience of telegraph and telephone matters, both in the provinces and at headquarters, and said that in parting with Mr. Findley the section lost an efficient and conscientious officer. It had fallen to Mr. Findley's lot to perform important traffic work in connexion with the extension of the Anglo-Continental telephone services and the arrangements made for the broadcasting of B.B.C. programmes and outside events.

On behalf of the Traffic Section, the Chief Inspector then extended to Mr. Findley best wishes for a successful career in his new sphere, and a continuation of good health and happiness.

Before making the presentation other members of the section made eulogistic remarks concerning their friend.

Mr. H. G. Trayfoot expressed his personal loss in parting with a capable officer, and made special reference to Mr. Findley's activities in promoting social and sporting events in the Secretary's Office.

Mr. C. Anderson, in a humorous vein, made racy references to unofficial incidents in which Mr. Findley is alleged to have been involved.

Mr. J. Magnall, on behalf of the cricketers, testified to the enthusiasm Mr. Findley had always shown in the capacity of Secretary and Treasurer to the Secretary's Office Sports Association. It was during his term of office that inter-departmental cricket matches came into being, with the result that a shield, presented by Mr. W. T. Leech, is now available for annual competition. The fostering of this rivalry in the playing fields between Headquarters departments is all to the good and tends to facilitate the performance of official duties.

In characteristic manner Mr. Findley expressed his heartfelt thanks for the handsome gifts and his appreciation of the goodwill extended to him as indicated by the size of the gathering and the sincerity of the speeches.

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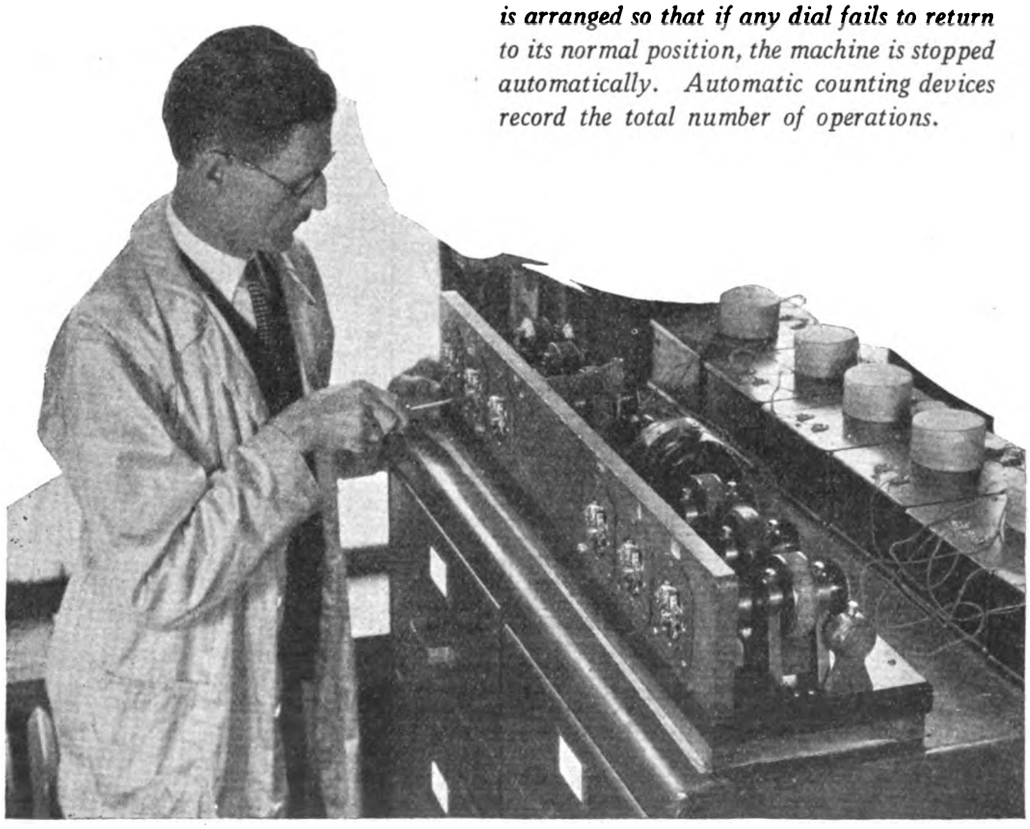
Where Strowger Auto

The

The Dial Testing Machine shown below is an ingenious device whereby each dial under test is turned mechanically from "O" to the finger stop and then released, delivering the equivalent of ten impulses. The circuit is arranged so that if any dial fails to return to its normal position, the machine is stopped automatically. Automatic counting devices record the total number of operations.



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Tests.

THE Type 24 Dial perfected and placed on the market two years ago by Automatic Electric Inc. has attracted the attention of telephone engineers and operating men throughout the world, because of the remarkable and hitherto unequalled records for endurance which it has established. Its perfect operation without any attention whatsoever, both in laboratory tests and in the hands of the telephone user, is the result of years of painstaking and untiring effort on the part of the Research and Development Staff of Automatic Electric Inc. to perfect a dial whose performance and endurance would be unapproached by a contemporary product.

The Dial Testing Machine is but one of the many ingenious devices which have been originated and constructed by the Research and Development Department purely for its own use in carrying out development work on various pieces of automatic telephone apparatus which are being improved or perfected. That the effort is not in vain is daily proved by the economy and efficiency of hundreds of Strowger Automatic exchanges in operation in this and other countries throughout the world.

More Than 3,500,000 Strowger Automatic Telephones in Service or on Order Throughout the World

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The
Telegraph and Telephone Journal.

PUBLISHED MONTHLY IN THE INTERESTS OF THE TELEGRAPH AND TELEPHONE SERVICE, UNDER THE PATRONAGE OF THE POSTMASTER-GENERAL.

Editing and Organising Committee - - - J. STUART JONES. W. D. SHARP. J. F. STIRLING. W. A. VALENTINE. J. W. WISSENDEN.

Managing Editor - - - W. H. GUNSTON.

NOTICES.

As the object of the JOURNAL *is the interchange of information on all subjects affecting the Telegraph and Telephone Service, the Managing Editor will be glad to consider contributions, and all communications together with photographs, diagrams, or other illustrations, should be addressed to him at the G.P.O. North, London, E.C.*1. *The Managing Editor will not be responsible for any manuscripts which he finds himself unable to use, but he will take the utmost care to return such manuscripts as promptly as possible. Photographs illustrating accepted articles will be returned if desired.*

VOL. XIV. SEPTEMBER, 1928. No. 162.

THE IDLENESS OF THE WISE.

OUR thoughts at the moment are concerned rather with sea waves than wireless waves; with trunks loaded with raiment rather than "traffic"; with hotel rather than telephone tariffs, for as we write the holiday season is at its height. Many familiar faces are missing, many are preternaturally bronzed from recent contact with the sun's rays, many reflect the joyous expectation of a holiday to come. Others of our colleagues again are wistfully wondering if their official responsibilities will enable them to get away while the sun is still in friendly mood.

It is a blessed institution this, which gives us a complete temporary release from the daily task, however congenial the work in hand may be. Though the very steamer in which we cross the North Sea, or the Channel or the Irish Sea, may blatantly advertise its wireless telegraph, we shall be unconcerned in its working. Our landlord may bellow "Allo! Allo!" into his telephone with a foreign intonation, but we shall be indifferent to the result; strange telephone standards may strike us by their pleasing or fantastic design, but we are content to feel that others had the task of obtaining wayleaves for them, that others had the care of their erection or of figuring out the wires and loads they carry or the revenue they earn. This is our season of leisure; that of those others has come or will come, we trust, in due course. The outward emblems of our craft or profession may intrude on the landscape; we can view them with indulgence or indifference. Ours is no 'busman's holiday, for, like the Preacher, we believe there is a time for all things. Idleness, says Lord Chesterfield, in his Letters, is the holiday of fools; holidays, we may contend, are the idleness of wise men. The great loom will be running on with a contemptuous indifference to our absence, and we know that we can pick up the threads again on our return.

But it is easier to write in this vein than to carry out the precepts of aloofness and entire freedom from concern in our life's work which it inculcates. Even as we cast a languid and incurious eye on the daily papers which follow us wherever we go, a paragraph on the doings of our Department—some new service opened, some old service extended—fixes our attention and arouses our interest. Although holiday resorts are not the likeliest places to afford object lessons in telephone or telegraph practice, no sooner should we discover in our wanderings something worthy of note, something in our special milieu to view or read of which could lay claim to novelty or instructiveness, than we should be moved to visit and study it, however cursorily, by an instinct or habit stronger than ourselves.

HIC ET UBIQUE.

AUGUST was another eventful month for the Anglo-Continental telephone service. In the first place service was extended to all places in the I and II Norwegian zones, i.e. to all places in Norwegian territory south of latitude 64° 30′. The service, therefore, now reaches Bergen, Stavanger, Trondhjem, Kristiansand, Kristiansund, and other important Norwegian ports.

In the second place, a new telephone service was opened between this country and Italy, confined for the present to Milan. The charge for a unit day call between London and Milan is 9*s*. 6*d*.

Thirdly a "through" circuit was opened between London and Vienna, the service having hitherto been switched at Frankfurt-on-Main, and the charge for a unit day call between London and Vienna reduced to 14*s*. There are now "through" circuits existing between London and 9 European countries, i.e. to France (Paris, Lille, Calais, Boulogne), to Belgium (Brussels and Antwerp), to Holland (Amsterdam and Rotterdam), to Germany (Berlin, Hamburg, Cologne, Düsseldorf, Bremen, and Frankfurt), to Switzerland (Basle, Zurich, and Geneva), to Sweden (Stockholm, Göteborg), to Denmark (Copenhagen), to Spain (Madrid), and to Austria (Vienna). The map reproduced on the opposite page shows the routes taken by these circuits. The longest of these through circuits are those to Stockholm 1,325 miles, Madrid 1,144 miles, Vienna 993 miles, Copenhagen 938 miles, and Berlin 863 miles.

On Aug. 1 a temporary "through" circuit was provided between London and Paris—Plage for seasonal traffic, affording an accelerated service between those places. Last of all, on the 30th of the month, service was opened between London and Ceuta via Madrid, thus providing communication for the first time between London and the North of Africa. The charge for a unit day call between London and Ceuta is 26*s*.

A paragraph in the *Sunday Times* deploring the backwardness of this country's telephone development, says that there are fewer

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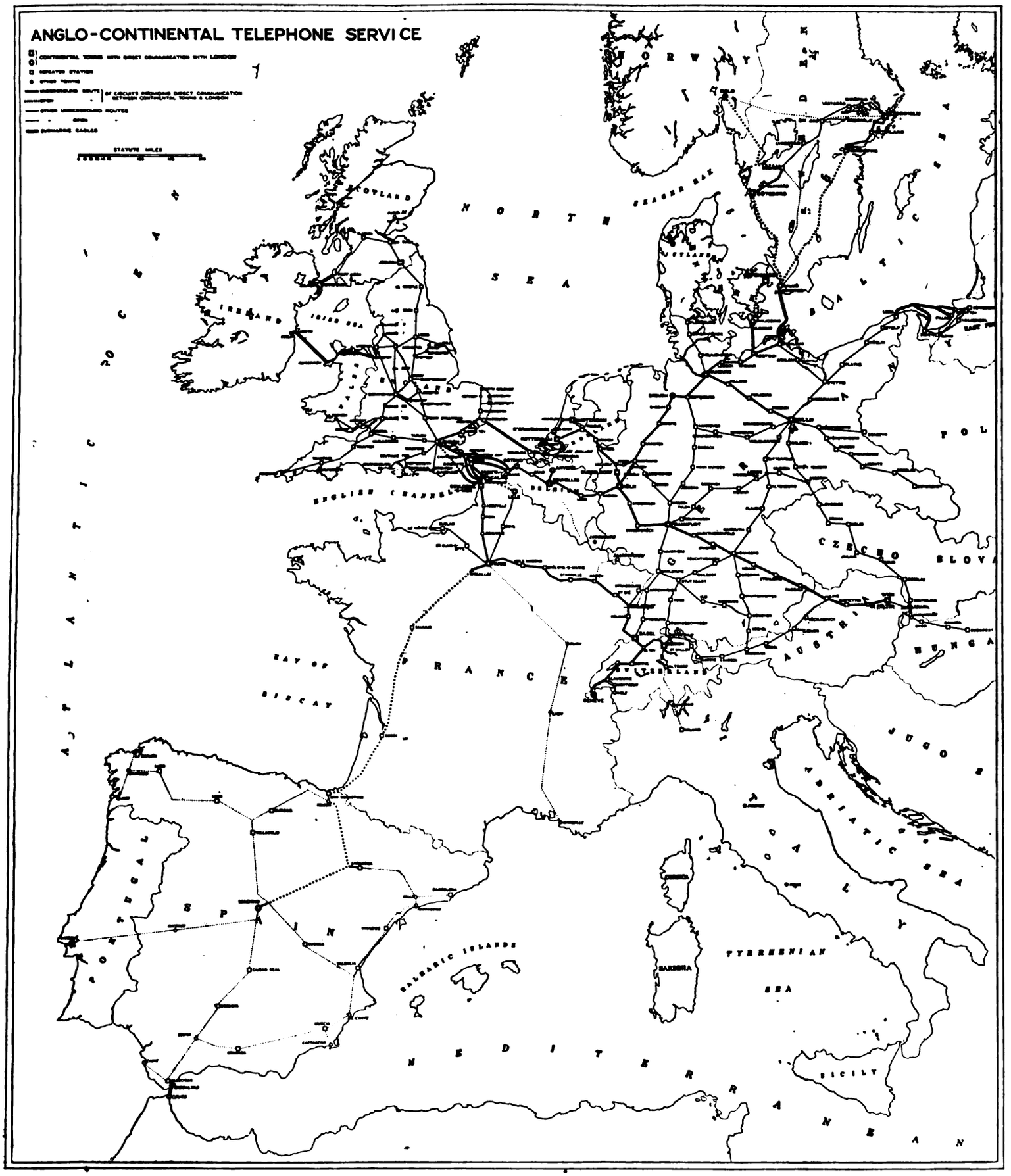

THE ABOVE MAP SHOWS THE "THROUGH" LINES BETWEEN LONDON AND CONTINENTAL SWITCHING CENTRES AS WELL AS THE MAIN UNDERGROUND CABLE ROUTES. IT DOES NOT PURPORT TO SHOW ALL THE PLACES IN EUROPE WHICH CAN BE REACHED FROM LONDON.

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stations per head of population here than in any civilised country. This is overstating the case with a vengeance. Our development is ahead of that of Holland, well ahead of that of France, Belgium, Austria, and Italy, to say nothing of Spain, Portugal, Hungary, Poland, &c., and we hardly think the writer would deny the claims of the Argentine and Brazil and several other extra-European states to be considered civilised countries, though these also are far behind us in development.

Mr. J. K. Waterson, in the course of an interesting article on Transatlantic Telephony in the *Bell System Technical Journal*, remarks :—

"Differences in the English language as spoken in London and New York became evident as soon as our New York operators were placed in communication with the operators in London. Each group expressed some concern as to what the other was doing to their language. I believe the London operators were inclined to think the broken English spoken by the telephone operators in Holland was sometimes easier to understand than New York City English."

We imagine that by now New York telephonists no longer believe that Londoners habitually say "Hamerican" and "Hinglish," as they are fabled to do by American humorists, and that on our side operators will have learned that Americans do not introduce "sure" and "some" and "Oh, boy" into every sentence.

In the article, "Possibilities of a Trans-Continental Long-Distance Telephone Service between Europe and Asia," by a typist's error "m." was sometimes expanded to miles when it stood for metres. We do not, however, think that our readers were deceived into the belief that the Euphrates is 800 miles wide at Jerablus.

WASTE.

THE prize papers in the issue of the *Telegraph and Telephone Journal* for August on the saving of waste are very interesting and provide much food for reflection. There are, however, two particular features which probably struck one. First, that all the papers were on traffic matter, and second, that the waste, at least according to two of the papers, came mainly from the human element.

To take the first point. While traffic may be the main item of the telephone business one cannot imagine that it is the only section where there is waste. What, therefore, are we to deduce. That it is the only section who have suggestions to make for reducing or eliminating it ! Surely not. Perhaps the other sections fight shy of the term "waste," but call it what you will it cannot be denied that there must be some waste in all departments. Where are the Accounts Section and the Contract Section ? Presumably the Engineering Branch are not excluded.

The paucity of papers is most probably due to the modesty of the staff, who hide their light under a bushel, as there is evidence of the fact that many of the staff often make valuable suggestions for improving matters, perhaps quite small in themselves, but having a cumulative effect. For instance, at frequent conferences of operating staff, to which reference has been made in the *Journal* from time to time, many points are raised and suggestions made tending in the direction of improving methods which, after all, is the same thing as saving the waste.

A few examples of saving in Accounting methods can be given, which it is believed have been adopted, viz. :—

A number of hours saved per quarter by the association of 20 or more days' Trunk tickets for sorting, instead of for 8 days at a time.

Printed forms used for investigating disputed calls, spare number calls, and such-like, instead of dealing with each in manuscript or even mimeograph form.

Using adding machines for totalling the number of "large user" local calls on Forms Tp.291.

Eliminating all superfluous figuring for meter calculations, i.e., "Tests and Credits" entered in such a manner that they can be deducted mentally instead of additional figures being written.

Trunk ticket values machined on the "strip" paper instead of to account forms for Call Office "Large user." Time is saved as only one account form is used to which the "strip" paper is attached.

These are sufficient to show that there is room in sections other than Traffic for the elimination of waste, or, if preferred, for improvement in methods tending to reduce costs.

The next and second point brought out, i.e., the personal element, points rather to waste on waste and causes one to ask whether the right persons have been selected for the posts. The appointment to a telephonist position is one of few positions that is in the hands of the local administration. Traffic Officers and Clerical Officers are recruited from open competition, but telephonists from selection. It is, therefore, clear that if we make a mistake in the primary selection we are introducing the elements of waste. Waste of time and money in training an officer who will create more waste by not giving a maximum of efficiency.

Great responsibility, therefore, rests with those who have this duty, in selecting only those who show all the essentials necessary for meeting this standard. The opinion is that, generally speaking, the standard of applicant to-day is as good as or better than in the past, and if only the best are selected and then given a sound training and not allowed to become too mechanical (thus destroying their initiative), but rather to develop their individuality, it will tend to eliminate much of the waste of which the writers mention.

W. E. G.

THE POST OFFICE TELEGRAPH AND TELEPHONE SOCIETY OF LONDON.

SESSION 1928-29.

THE opening meeting of this Society will be held at the Institution of Electrical Engineers, Victoria Embankment, on Oct. 15, when Mr. Frank Gill, O.B.E., Past-President, I.E.E., and Vice-President International Telephone and Telegraph Corporation, will give a lecture entitled "International Telephony." We feel sure that Mr. Gill will have a large and interested audience.

Other lectures and addresses during the session will be given by Mr. J. Stuart Jones, M.B.E. (Chairman for the Session), Mr. M. C. Pink, Mr. G. T. Archibald, Mr. A. J. Waldegrave, Captain P. P. Eckersley and Mr. J. J. Tyrrell. The complete programme will be published in the next edition of this journal.

CORRESPONDENCE.

ADVERTISING THE TELEPHONE SERVICE.

IN Mr. J. M. Shackleton's letter in the July issue the word "not" was inserted by a printer's error in the 5th paragraph, which should begin :—

"If, however, the Department does set about utilising the sites at its disposal," &c.

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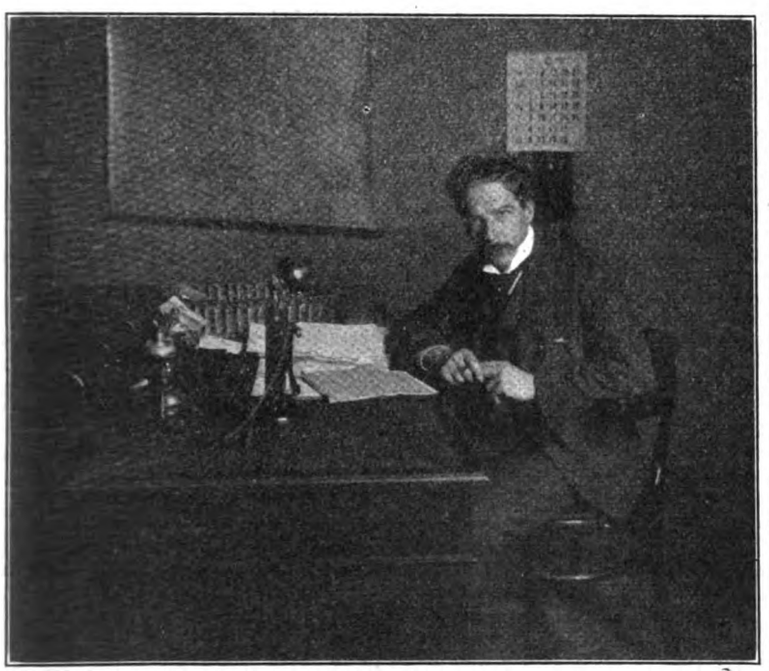
ECONOMICS: FANTASTIC AND OTHERWISE.

BY E. J. JOHNSON (*Glasgow*).

TRUE economy should go hand-in-hand with increased efficiency and therefore implies the elimination of all waste in material, time and effort. Thus the simplification of operations which are unnecessarily complex, or which, if performed by hand, can be done equally well, or better, by machine, is progress in the right direction.

In telephone exchanges there are many complex operations, and if anything can be done to simplify them a saving is effected.

The manual operations in central battery exchanges have been so standardised that little, if anything, can be done to make them easier or more simple.



MR. E. J. JOHNSON.

The only thing that remains, therefore, is to cut out non-productive calls and to ensure that each time a connexion is desired there is a reasonable possibility of effecting it. To achieve this there must be an adequate supply of junctions, both to other exchanges and to subscribers' private branch exchange switchboards. Also the arrangements made by the subscriber for answering the calls should be such as to ensure that this is done without delay. There should be an absence of wrong number trouble due to careless operating or bad pronunciation.

A high standard of maintenance is also necessary.

Subscribers' complaints cause a waste of time and energy, and if these can be rendered unnecessary by good operating and maintenance, or if and when they occur they can be "nipped in the bud" by telephonist or monitor and a letter prevented, then much time and worry will be saved. In this connexion it is usually better to accept blame rather than set up a defence and to reconnect than to argue. A sentence on the office wall in a film scene, "The voice with the smile wins," is worth remembering in this connexion by all who transact business over the telephone.

Clerical work in exchanges has a tendency to grow and anything that is unnecessary should be ruthlessly cut out.

The accounting work in connexion with trunk calls in all exchanges is increasing and in the larger centres an excess of checking for errors is liable to develop. A case was observed recently where the error detected and corrected by checking was in the nature of 1 in 10,000, a serious expenditure of time and energy which should have been put to better purpose.

There is one item which is growing and is causing an increasing amount of work in combined exchanges—the dating of trunk tickets.

In the Glasgow district there are between 8,000 and 9,000 of these to date stamp by hand daily. This takes 3 to 4 hours; surely an inexpensive rotary dating machine is available, or could be manufactured at small cost which would do the work in a few minutes.

The flow of telephone traffic, while retaining its general characteristics, varies in volume from day to day. Elaborate attempts are made from time to time, four times a year at least, to adjust the staff to the traffic in such a way that at all hours throughout the day the telephonists are taking a standard load. To take a record of telephone traffic the primary and secondary meters are read 25 times in 12 hours. In an exchange of 85 positions this is equivalent to reading 4,250 meters; also the same number of peg counts are recorded to determine the number and percentage of local and junction calls. There is an almost endless number of subtractions, additions, and multiplications to be gone through before the count is reduced to valued calls. The load thus obtained is true, in volume, only for the day or days during which the record was taken.

The staff is adjusted to the load so obtained and expected to suffice for three months, there being no allowance to cover day-to-day fluctuations.

The expansion of the actual load to the volume anticipated 3 months ahead is recognised as being of assistance in providing staff after training, but it is of little value for immediate purposes.

The characteristic shape of the loadline for the large exchanges is well known and unless the exchange is growing rapidly, varies little from year to year. In any case the number of "A" telephonists is usually determined by the number of positions it is necessary to staff during the busy hour.

Why not make use of the facts already stored in our Traffic Statistics? Draw a large scale characteristic load line on squared paper, and at the quarterly statistics, or when necessary, read the meters at 8.0 and 9.30; 9.30 and 10.0; 10.30 and 11.0; 1.0 and 1.30; 5.0 and 5.30; 7.30 and 8.0, or twelve times instead of twenty-five, also the peg count, and thus save many calculations and much time in exchange and traffic offices. The valued load so obtained would be marked on the load-line paper and the intermediate points in the load would be plotted in as indicated by the actual figures and the characteristic load line. Any increase in the load would be readily detected by the plotting on the curve and the total load for the day would be given by the difference between the first and last readings of the meters.

The adjustment of staff to load should certainly be as close as possible, but as we are dealing with averages the agreement to any one particular record should not be pressed too closely. If this is done overload may occur and revenue be lost by inefficient operating. Much time is spent and worry caused by efforts in this direction. The time and effort so spent would be much better occupied in dealing with other problems of the service. This is particularly true when too close agreement, on theoretical lines, is pressed without the correcting factor of knowledge of local conditions.

It will be necessary to take a full traffic record at suitable intervals, possibly not more often than once a year, to correct any variation in the characteristic shape of the load.

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The reading of position meters is a troublesome and lengthy business, and if a master meter of some kind were available, much time per reading would be saved, also the more frequent checking of the load would be possible.

The problem has been attacked from the electrical standpoint but hitherto has not been solved.

Has the question been put to the calculating machine people ? They might be able to design a machine which would register and tabulate successive, and when necessary simultaneous, impulses delivered to the mechanism by suitably designed electro-magnets.

A Traffic Superintendent once, in a dream, saw every position register connect to a hopper of steel balls and each time a register actuated one of the balls rolled down into a scale pan graduated to read calls, the load for any period being obtained by reading the scale indication. But alas, so seemingly simple a method is but a dream and because of the space required and complications does not appear possible of realisation.

The economical working of an exchange staff, no matter what the Traffic Office arrangements may be, is very largely dependent on the supervisors and their alertness to the distribution of telephonists according to the day-to-day incidence of the load. The proper distribution of reliefs and their restriction to the recognised limits may make all the difference between the staff giving a good or bad service. Economical working may, I think, include the efficiency of a given number of telephonists equally with alterations which may result in their reduction in number at the expense of service.

Any seeming economy which tends to restrict traffic requires careful consideration, because a slight increase in traffic is most valuable and has far-reaching effects. If 50,000 stations can be induced to make one call per day more than at present, the revenue benefits to the extent of £62,500 per year of 300 working days, and conversely anything which restricts traffic will have the reverse effect. Considerations of this kind make it dangerous to press economy in telephonists, junctions, or other equipment, to the limit.

The telephone service exists to cater for traffic and must do nothing to restrict or hamper the making of calls. A wise discretion must be used and the spirit of true economy will be shown by the provision of facilities where they are necessary and refusing to provide for an imaginary need.

In the larger C.B. exchanges there is frequently an extensive junction multiple, and as a result of the growth of the system and increasing number of junctions congestion is approaching.

The years of most large manual exchanges are numbered, and expensive alterations and re-arrangements are to be avoided if at all possible. When junction multiples reach a large size, they are a serious drag on the operating, and for multiples of 720 jacks and up to 1,200, there is an allowance of 0.05 to compensate for this in some measure. It is my opinion that when there are 1,000 jacks this allowance is not sufficient, and that 0.10 would more nearly represent the drag.

For the larger groups of junctions order wires are in use and the necessary keys, &c., occupy much valuable space on the switchboard.

It is suggested that the larger groups of junctions, say from 10 lines upwards, be connected to rotary line selectors, led to a jack on the junction multiple, the operation at the "A" end being : Telephonist plugs in jack, gives number to "B" telephonist, and sees call through.

At the "B" end of the junction a lamp associated with the junction selected to glow, the junction automatically connected to the "B" telephonist who repeats the number to the "A" telephonist and connects. As the board is keyless the operation will be speedy, and arrangements should be made for waiting calls to be "stored" for the few seconds which may be necessary on occasion.

If a method as outlined can be adopted the following advantages over the present large multiples may be anticipated :—

(1) Reduction in size of the junction multiple.

(2) Reduce the wrong number trouble (there being no repetition of junction number necessary the subscriber's number is repeated by the "B" telephonist).

(3) Plugging into wrong jack or depressing wrong order wire reduced as the selector jacks being few in number can be well separated and clearly labelled.

(4) Reduce the operating value of outgoing calls.

The operation of an order wire call, while very speedy, is complicated. A comparison of the manipulation of an order wire call and a selector junction call is given below :—

"A" TELEPHONIST.

After repeating Number to Subscriber.

Order Wire.	*Auto-Selection.*
1. Goes out of circuit.	1. Plugs in auto-selection jack.
2. Depresses order wire key.	2. Gives number.
3. Gives number.	3. Sees call through.
4. Tests junction assigned.	4. Restores speaking key.
5. Plugs in.	
6. Goes into circuit.	
7. Sees call through.	
8. Restores speaking key.	

The number of operations is considerably reduced, halved in fact ; this reduction in the number of operations should reduce the value of the call by say 0.09. There has been no means of testing this but a figure which appears reasonable has been adopted.

In the Glasgow Central Exchange the value of a junction call is 1.64. If the size of the multiple be sufficiently reduced the allowance of 0.05 must be taken away, leaving 1.59, and if a further reduction of 0.09 be made for the simplified auto-selection calls, the value is reduced to 1.50, a reduction of 0.14.

The busy hour equated E load for the Central Exchange with a junction value of :—

1.64 is 16,942, and
1.50 ,, 15,733

giving a reduction of 1,209 valued calls or a saving of six telephonists.

The possible saving under this heading (provided the assumed reduction in value of the load holds good) will go a long way towards providing the necessary switching equipment.

In exchanges where the junction multiple allowance is 0.1 the saving will probably be greater than in the case cited.

There is one other point which may be worth consideration—a reduction of "A" positions by six will, in many cases, prolong the life of an exchange sufficiently to "tide over" to the introduction of full automatics.

This paper is in the nature of a series of suggestions which have a bearing on the prevention of waste, otherwise economy, more than a record of actual achievement, my previous paper having dealt with this aspect of the subject.

Mention has not been made of the introduction of machines for accounting purposes and other items which are the outcome of known Departmental policy, neither has there been any attempt to trespass from the pastures (green or otherwise) assigned to the Traffic Office.

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PROGRESS OF THE TELEPHONE SYSTEM.

THE total number of telephone stations in the Post Office system at June 30, 1928, was 1,662,201, representing an increase of 10,961 on the total at the end of the previous month.

The number of stations working at June 30 last, in London, England and Wales (excluding London), Scotland, and North Ireland was as follows :—

	No. of Stations at June 30, 1928.
London	589,861
England and Wales (excluding London)	900,774
Scotland	150,852
Northern Ireland	20,714

The growth for the month of June is summarised below :—

	London.	*Provinces.*
Telephone Stations—		
Total at June 30	589,861	1,072,340
Net increase for month ...	4,157	6,804
Residence Rate Subscribers—		
Total	137,103	217,638
Net increase	1,320	1,849
Call Office Stations—		
Total	5,313	19,248
Net increase	36	152
Kiosks—		
Total	993	4,139
Net increase	34	113
Rural Party Line Stations—		
Total	—	10,294
Net increase	—	63
Rural Railway Stations connected with Exchange System—		
Total	—	936
Net increase	—	18

The total number of inland trunk calls dealt with during April (the latest statistics available) was 8,489,292, an increase of 476,563, or 6% compared with April, 1927.

Outgoing international calls in April numbered 31,889 and incoming international calls 35,602, representing increases of 6,747 (27%) and 8,298 (30%) respectively, over the corresponding month last year.

Further progress was made during the month of July with the development of the local exchange system. New exchanges opened included the following :—

LONDON—Beckenham, Sloane (automatic).

PROVINCES—Batley, Garston, East Grinstead. Automatics : Rochdale, Castleton, Heywood, Littleborough, Milnrow, Norden, Shaw, Whitworth, Lofthouse Gate, St. Marychurch.

and among the more important exchanges extended were :—

LONDON—Croydon, Kelvin, Kingston-on-Thames, Purley.

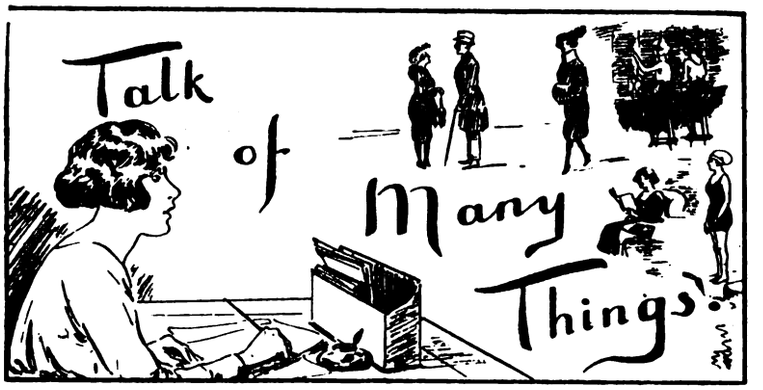
PROVINCES—Bristol, Cheetham Hill, Felixstowe, Glasgow (Western), Gosport (automatic), Old Swan (Liverpool), Wavertree (Liverpool), Rotherham, St. Helens, Trafford Park, Wallasey.

During the month the following addition to the main underground system was completed and brought into use :—

London—Camberley—Bracknell cable,

while 63 new overhead trunk circuits were completed, and 72 additional circuits were provided by means of spare wires in underground cables.

WE TELEPHONISTS



The Coffee Cult.

ONE morning recently I dropped into a teashop to have a cup of coffee. Doubtless, that statement will be received with but the slightest flicker of interest. There does not appear to be anything extraordinary about it, and it does not seem to justify the use of pen and ink and paper. Possibly you might have evinced rather more interest—or even some concern—had I said that I had dropped into a coffe-shop for a cup of tea. A visit to a teashop implies a certain degree of moneyed leisure, but a visit to a coffee-shop implies a certain degree of neediness coupled with a suggestion of manual labour which is quite tiring. But behind the simple fact of my entry into a teashop there lies much that is remarkable. I was aware that numbers of people indulge in morning coffee, but I had hitherto regarded it merely as a habit and of no special significance. I find, however, that I am wrong—morning coffee is not a habit of the dilatory, it is an act of devotion attended by the solemn rites of a mysterious cult.

My interest in the matter was first aroused when I realised that at about 10.30 in the morning the movement in the streets undergoes a sudden and peculiar change. The stream of people on the pavements becomes diverted to certain definite points, and the usual alert business stride is replaced by a sort of furtive scurry. Ever and anon unobtrusive office doors open carefully and people sidle out cautiously in ones and twos. It is as though they had been summoned mysteriously to a secret meeting of an even more secret society at an altogether secret rendezvous. Their evident desire for self-effacement and anonymity appeared to confirm this view and to imply that discovery would involve persecution and perhaps annihilation.

I resolved, therefore, to investigate the phenomenon in person, and, disguised as an Anxious Enquirer, I borrowed twopence and entered a teashop. At first my steps led me downwards to what I thought must be catacombs, but I found myself instead in an underground hall ablaze with light and wondrously decorated with gold and crystal. Marble tables were placed at regular intervals throughout the hall, and at these tables were seated the devotees of the cult. There, amid a haze of the incense of tobacco, they sipped their coffee and devoted themselves to a ritual, involving the use of dominoes, draughtsmen and chess pieces. Participation in these devotional duties appeared to be limited to members of the cult, for I could perceive that such unbelievers as were present were only permitted to watch. Coffee was served by vestals clothed in black and white robes who were known generically by the name of Miss. Apart from the unbelievers, there seemed to be three well-marked divisions in the assembly—the novices, who were occupied with dominoes, the coffers who were deep in draughts, and the arch-coffers who were lost in chess. There were only a few of the latter, and they never touched their coffee until it was cold—presumably some added mortification of the flesh to maintain the highest degree of piety. These, I gathered, were the very high priests of the order—a dignified position reached only by graduation via draughts. While I lingered, there was a continual procession of members in and out. On the faces of those who left I noticed a calm and beatific expression as of a conscience well satisfied in the performance of a high spiritual duty.

It was all so very wonderful and inspiring that it seems impossible to believe that the cult is unpopular with the chiefs of offices and business houses, and that devotees have frequently to change their rendezvous to escape discovery. Why, I myself was nearly—but hush ! PERCY FLAGE.

The New Moon.

Tradition tells us that it is unlucky to see the new moon through glass—and tradition is, undoubtedly, right.

The " Man in the Moon " appears to possess a peculiar attraction for our young people ; when new he greets them through the leafy boughs of the tall trees, and when he has grown to his full stature he bestows a benign, fatherly smile upon them as they wander hand-in-hand along the rural avenues or the quiet, country lanes.

But this friend of youth does not love all the sons of men, for when he appears in the glory of his newness amid the stars of Heaven, the tempers of certain mortals are stirred with an exceeding fury.

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We know your ways, oh Moon ! They are thrust upon us in the course of our daily work and are known as " Verbal and Written Complaints."

The subscriber affected by your frolics knows neither reason nor understanding. The emancipation of women is of little importance to him. He will not speak to a woman ! The telephonist talks of " trying to get the number " he requires, the supervisor talks of doing her best to obtain it. How these women can talk !

Connect him to the Service Superintendent, the District Superintendent, the Controller ; give him a man ! He *must* hear the low, vibrating tones of a man's voice as he gives vent to his anger. But tremble, oh man ! for our " New Moon " subscriber is either a relative of the Controller or a personal friend of the Postmaster-General.

Consider the economy which might be effected if written complaints were entirely eliminated ; no longer would the interminable documents be circulated from one office to another, and that wonderfully executed curve would cease to be exhibited in the exchange.

But " Father Moon " decrees that these things shall continue. For what other excuse can be found for the caller who inserts sixpence in a multi-coin box for a twopenny call and expects to receive fourpence change ?

The pen may be mightier than the sword, but the subscriber evidently regards the hammer as mightier still, who states his complaint in such terms as these—" It would be a good idea if all the operators were known by a number, for then you would be able, readily, to hit on the head the person responsible for the trouble."

What scientific relationship exists between the moon—especially the new moon—and the human temperament ? Try as one will, one cannot find a satisfactory explanation ; the mystery eludes us, the problem remains unsolved. Let us examine it more closely.

We can safely assume that in the ecstasy of " Love's young dream," that great force of nature is viewed through the naked eye, but no such assurance can be given concerning those upon whom the moon visits his displeasure. Perhaps they discern his golden splendour with the aid of glass and he is affronted.

So Tradition is probably wise when she says—" Never look at the new moon through glass—it is unlucky ! "

G. M. T.
London Wall Exchange.

An Experiment in Friendship.

On Aug. 11 a brief notice appeared in the Daily Press to the effect that 17 nationalities bathed together at Sandwich Bay. Some of you who saw the announcement may have wondered who these people were, and will perhaps be interested to hear of the experiment in international friendship, of which the incident referred to was a part.

Just outside the old town of Sandwich, in the huts which formed part of a large military camp during the war, there gathered together, on Aug. 3, from all parts of Europe, a company of 250 people, representing 17 nations, including Great Britain and India. They came together at the invitation of the Fellowship of Reconciliation—a few, just because it was an international gathering, but most with a deeper concern to study together the spiritual foundations of peace—all sharing in the common desire for friendship and understanding.

Groups made up of various nationalities such as Germans, Czechs, Austrians, Americans and British, sat together, discussed problems and shared experiences in a frank and friendly spirit. Translations were usually necessary to enable everyone to understand, but any difficulties of language were easily overcome.

In lectures and discussions, through friendly conversations, through the sharing of work in the camp and in common recreation—walking, bathing, tennis, and other games—we were drawn close together till, by the end of the week, we seemed a large family gathering and were loath to break up and scatter to our various homes.

Perhaps the most memorable scene was the closing meeting round the camp fire when, after national songs and dances, in the gathering dusk, the flaming torch—symbol of love which nothing can quench—was passed round the inner circle of representatives chosen out from each nation. Then in the deep stillness which followed the lighting of the fire, one after another rose up to express in his or her own language, something of the inspiration and help which the Camp-Conference had brought. In that wonderful experience of fellowship the barriers of race were broken down and we realised our unity as parts of the great world family.

Telephone supervisors and operators were represented at the conference, one of the supervisors coming from Liverpool Trunk Exchange.

This was the third of such international gatherings arranged by the Fellowship of Reconciliation, the two previous camps being held in Germany and Switzerland. Next year they hope to hold a camp at Nancy, in France. Many of those who were present this year are looking forward to meeting again then, and would, of course, welcome the presence of any others who are interested.

I. E. REES.

Competition.

A further postponement is necessary, owing to annual leave, in connexion with the report of the result of the competition. It is hoped to report fully in the October journal. In the meantime, sketches may still be submitted.

Contributions to this column should be addressed THE EDITRESS, " Talk of Many Things," *Telegraph and Telephone Journal*, Secretary's Office, G.P.O. (North), E.C.1.

GLASGOW TELEPHONE NOTES.

ON one or two previous occasions reference has been made in these notes to the good work being done by the Telephone District Staff by way of entertainment to those of our boys who are still in hospital as a result of disablement or injuries received while on active service.

The scheme consists of teas and concerts during the winter months plus a theatre show if funds permit, while during the summer season at least one char-a-banc or other type of picnic is given.

It is very nice to " do good by stealth and blush to find it fame," but even that principle can be carried too far. It would be well in this work-a-day world of ours if we remembered the good things that were being done as readily as we recollect the " otherwise."

Therefore, all honour to those members of the District Manager's Staff who contribute their mites to this commendable arrangement, to those who collect and remit, and last, but not least, to those who take on the additional duty of acting on the committee, and who see to it that the funds are well and truly applied and that the concerts never fail to attain the desired standard.

As for the artistes, all of them honorary, it is sufficient to say that the writer has many times paid highly for his entertainment and often been less pleased with the provided fare. We have specially to thank also our energetic and genial Hon. Secretary, Mr. T. S. Ward, for his services in connexion with these entertainments.

The war ended nearly ten years ago. The fever has subsided and, to a great extent, reaction killed war-time fervour and worship of the boys in uniform. That now there is still to be found in Glasgow the spirit of loyalty to those who suffered, and who are suffering, for us is something of which the district may be, and is, proud.

During the last four financial years I am told that no less an amount than £267 2*s*. 9*d*. has been raised, and a number of books contributed by the Glasgow Telephone Staff for this purely local effort. Comment is unnecessary, but that the good work may continue is the earnest wish of those who can still remember.

Life's Little Ups and Downs.

[N.B.—All characters (bad or otherwise) in this drama (?) are entirely fictitious, not to say superstitious and decidedly suspicious. If by chance (or design) any actual individual happens to be named, no personal reference is intended.]

Scene : A noble edifice in Hanover Street, Glasgow.

*A SUMMER MORNING.

ACT I.

At the foot of the stairs. Time 8.58 a.m. (A notice bears inscription ** " HOIST OFF.") *Enter dripping, singly, various Props and Pillars of the Glasgow Telephone Service.*

1st P. (or P.) of G.T.S. (pressing bell-push) : " Nasty mornin' !"

2nd Ditto : " Aye ! "

3rd Ditto : What like was it oot at Mulguy this mornin' ? "

2nd Ditto : " Och ! no sae bad as this."

3rd Ditto : " Well, at Mosspark it was simply —— " (seeing notice) " Och ! look at yon ! " [*Exit, upstairs.*]

2nd Ditto : " What, again, sae soon ? " † [*Exit, upstairs.*]

1st Ditto : " Ach tae —— ! " †† [*Exit, wearily, upstairs.*]

(*Band outside commences to play " There's a long, long trail awinding."*)

ACT (or rather won't) *II.*

A cage-like contrivance, stationary, between 2nd and 3rd floors. Time—the same.

[A diminutive gentleman (in uniform) is toying with a brass handle, apparently ornamental. A number of Props and Pillars, &c. are contemplating him with equanimity †].

D.G. (in U.) [confidentially, to nearest P. (or P.)] : " Did I tell ye the yin aboot —" (c-l-c commences to descend.)

ACT III.

The basement—immediately below scene of last act, 1⅛th second later.

[*Enter, suddenly, from above, cage-like contrivance, with contents as aforesaid.*]

Chorus of P. and P. (male) : " Ouch ! "

Chorus of ditto (female) : " Ooh ! "

D.G. (in U.) : " Well, I never ! " [*All collapse in heap.*]

Curtain.

(All rights deserved.) A. E. HIGGENS.

* Or spring (might even have been autumn or winter.)

† Or words to that effect.

†† A Gaelic expression of extreme delight.

** [We take it that this is Scots for Lift (Elevator or Ascenseur) not working.—ED., *T. & T. J.*]

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"No Reply."

An operator, having reported "No reply" from a number, was requested by the calling subscriber to try once more as he was certain there should be an answer. The operator, therefore, made a further attempt to gain the attention of the desired number, but was still unsuccessful, and, on advising the caller of this, was greeted with "Good gracious, exchange! there's a baby in the house."

Visions of the baby vainly struggling to reach the receiver to oblige the irate subscriber were conjured up, but nevertheless the call remained ineffective. M. L. T.

West End Park, Glasgow: A Reverie.

I was resting on a seat by the "Lord Roberts" statue overlooking the West End Park. It was an autumn evening and nature was resplendent with warm colourings. And as I gazed and mused on the beautiful scene all around me I marvelled at the richness of the picture set like a cameo in the midst of a busy city—the park itself, a joy of wild wood and stream, cultivated lawn and flower bed surrounded by beautiful buildings—the whole aspect representative of almost everything in life; the University, standing out on the hill, proclaiming learning, the Art Galleries with their treasures representative of the arts, the Kelvin Hall in the near vicinity telling of trade exhibitions and frivolity, the tennis players flitting to and fro typical of recreation.

The very play of Life was being enacted before me in the steps of the passers-by—the light, happy step of irresponsible youth, the slower tread of experience and thoughtfulness, the satisfied stroll of age and the dragging feet of sorrow.

And over all there was a blue-grey haze; and as I listened to the songs of the birds I seemed to hear numbers of melodies vibrating in the air, and as evening fell and the haze deepened a great peace spread all around, and the melodies harmonized themselves into a wonderfully beautiful chorale. And as the music swelled forth the name of it was written in flames across the sky, and was called "The Search for Light."

Then black night came down and hid the park in darkness, and the distant lights shone out one by one and I was wafted on the wings of night and music, and found myself in Venice drifting idly on the Grand Canal. A ripple of laughter floated towards me as another gondola glided past my own and —— some friend touched me on the shoulder "Dreaming again!" What is it this time? M. L. TULLOCH.

REVIEW.

Letter to an Absentee Director: By John Lee, C.B.E. (Sir Isaac Pitman & Sons, Ltd., 5s. net.)

We have always known Mr. Lee as a man of many parts. Here we find him as a junior director, a man of about 40, "not much of a letter writer" (the remainder of the book does not justify this disclaimer), writing "chatty letters" to the chairman of his company, who is trying to recover his health on the Riviera. The letters purport to "look on business movements in England through the eyes of an absentee director." It might have been more appropriate for the absentee director to be the writer rather than the recipient of the letters; but the distinction is of no importance, for Mr. Lee gives the views not only of the writer but of the absent chairman, of a professor of political economy, and of a certain Briggs, a blunt but kindly old reactionary, and assumes the character of each in rapid succession.

In 100 pages of large print Mr. Lee treats of some of the principal problems of industry, such as profit-sharing, group-insurance, and works' councils. He attaches the greatest importance to personal contact between the directorate and the executive, and from this point of view advocates a system of functional directors, adequately trained for their respective duties. He considers that the employers should not only recognise trade unions but should take them into their confidence and seek their co-operation,—not a novel point of view but one that is worth reiterating. He is suspicious of welfare work: "mankind wants to work out its own salvation and hates to have its salvation thrown at it." He is suspicious also of schemes of profit sharing on the ground that they double the workers' risk. He warns us of "the danger of phantom secrets": we are glad to see that this danger is not confined to the Civil Service. He considers that capitalism is being glorified into a system of peasant proprietorship (by shilling shares and similar devices), and supports the comfortable doctrine that productive work is generally profitable to business.

Very few of us are directors, but we shall all welcome this further example of that vigorous and suggestive comment which used to delight us in the days when Mr. Lee was with us.

LONDON TELEPHONE SERVICE NOTES.

Contract Branch.

THE results obtained by the Contract Branch during the month of July were a net gain of 3,865 stations, as compared with 3,694 stations for the corresponding month of last year.

* * * *

Certain London newspapers are always tilting at the Telephone Service and asserting, without any equivocation, that if it were managed by business brains the development position of this country would approximate to that of America. Anyone would be convinced after reading many of the articles that have appeared recently that newspaper offices are the only business houses on this side of the Atlantic where telephones are provided on the American scale. On enquiry, however, we find that the newspaper which has been most blatant in its assertion has only *one telephone to every* 13,500 *of its circulation*, whereas a comparable American newspaper has *one telephone to every* 1,130 *of its circulation*. Nevertheless, let us be charitable and think that they have forgotten the old adage about people in glass houses rather than assume that they do not know the extensive use made of the telephone in American newspaper offices.

* * * *

It is interesting to find that sometimes we move far too expeditiously for our subscribers. In a recent case, 15 days after the completion of an order, the subscriber asked us to cancel the agreement as he had not been able to secure the lease of the premises ! ! !

He returned with this communication the official letter, sent a month previously enclosing an agreement to be signed, with the following limerick written on the back of it ! ! !

There was a young lady of Ryde
Who ate some green apples and died,
For within the lamented
They quickly fermented,
And made cider inside her inside.

Just as the above paragraph was being written the messenger brought another letter, which starts as follows:—

"The telephone which I asked for was installed so promptly that I did not have time to tell you that I wanted it installed at a different address. . . ."

* * * *

Retirement of Mr. T. W. Northmore.

Mr. Northmore, who retired on pension on June 22 last, had held the position of Contract Officer with the late National Telephone Company and the Department for many years, the greater number of which he had spent in the West District Contract Office. An amiable disposition endeared him to all with whom he came in contact, but his retiring nature somewhat narrowed the circle of his acquaintances.

He was a Cambridge graduate and for two years was cox of the light blue boat in the annual tussle from Putney to Mortlake. He served in the South African War and despite the inexorability of Anno Domini, joined up in the Great War.

As a mark of respect and goodwill his friends and colleagues presented him with a cheque for a substantial amount. The actual presentation was made by Mr. G. W. Livermore, District Contract Manager, who spoke of his long acquaintanceship with Mr. Northmore and his appreciation of the sterling work accomplished by their departing colleague, and Mr. Northmore suitably replied.

* * * *

Obituary.

It was with the keenest sense of loss and grief that the Branch learnt of the death, on Aug. 14, of Mr. F. F. Hogan, from phlebitis, following an attack of pneumonia, at the early age of 44.

Mr. Hogan joined the Post Office canvassing staff in 1909, belonged to the L Signal Battalion of the Royal Engineers during the war, and spent many years on the Development Section at Headquarters, where he was promoted to 1st-Class Contract Officer in 1923.

Later he had served both in the West and South-East Contract Offices, so that he was well known and his sterling qualities appreciated throughout the Branch, and the deepest sympathy is felt by all for the widow and her three young children in their great sorrow.

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Gerrard Exchange.

The staff of the Gerrard Exchange and their friends gave another entertainment at the Queen's Hospital, Sidcup, on Saturday, Aug. 11. Though it is nearly 10 years since the war ended there are still about 300 men at the hospital, about two-thirds being confined to the wards, and many to their beds. Happily, for all concerned, the event was favoured with glorious weather, and the lovely grounds were looking their best. Proceedings began with tea in the wards for the invalids, followed by a dining-room tea for those patients well enough to be away from the wards, and the visitors, and then everyone wandered about the grounds and hospital while preparations were made for a concert in the Recreation Hall. The little orchestra which has given its services on many previous occasions came to swell the programme, and gave an hour of light music till the concert began.

Many of the "Stars" of the recent London Telephonists' Society Plays came to sing, and a thoroughly enjoyable evening followed, with ices and light refreshments in the interval, and, of course, "smokes." A number of wives and families of the patients were invited to join in the festivities. The patients appeared to have a really good time and the visitors certainly did so. The Committee were very pleased that Miss Cox was again able to join the party, and much appreciate the help given by Mr. Pounds and Mr. Buckeridge, old friends and supporters, and Mr. H. Dean, whose first visit it was.

The Gerrard Staff have been giving these parties at Sidcup for over ten years, and have subscribed or collected about £800 for them.

Some time ago it was proposed to collect for a complete wireless installation but it was found that the building was not suitable for the usual hospital equipment. They have, however, a set for the Recreation Hall and a number of individual sets in the wards, &c., and as there are no funds to maintain these the Superintendent of the hospital is very glad of contributions towards the upkeep. If, therefore, any other exchanges would like to help with this, Miss James or Miss Roe, at Gerrard, will be pleased to receive subscriptions.

* * * *

Cricket and Football notes.

A most successful season was concluded with a match between the Contracts (Champions) and the rest of the league at Chiswick which resulted in a draw; the final scores being :—

Contracts :	*Rest :*
148	55 for 5 wickets.

The champions displayed fine form with the bat and fielded exceptionally well. Hodgkiss and Goodger put on 60 runs for the first wicket, and other useful scores were contributed by Evans and Dickinson.

The "Rest" batsmen were in no hurry to score runs, and seemed to be content to save the game. Nearly an hour was taken in compiling less than 30 runs, and Widdup seemed to display excessive caution in taking 1¼ hours to score 18 runs.

The L.T.S. will again run a football team and compete in the Civil Service League, Division II. The headquarters of the club will be moved from Raynes Park to Chiswick, and in view of the difficulty of accommodating all who would like to play on the Chiswick ground, it is considered fortunate for the club to be able to rent a ground there so early in their career. Several practice games will be notified shortly and arrangements are almost completed for the season's engagements.

Mr. Evans, of the Traffic Branch, will continue as the Secretary. It is expected that the team will be strengthened by the addition of several new players.

* * * *

Swimming.

The end of the swimming season is in sight and a number of galas have been arranged for September and October.

City and Central Exchanges will combine forces at the Holborn baths on Monday, Sept. 10, and in addition to numerous club events, the L.T.S. Plunging Championship will be decided.

Trunks and Toll will be at the same bath on Tuesday, Sept. 25, and two special events will be decided. There will be the L.T.S. 100 yards' Championship (free style) and a team race, the Civil Service versus Insurance Officers.

Avenue Exchange will hold their gala at Aldgate baths on Friday, Oct. 5, and the special event there will be the L.T.S. Graceful Swimming Championship.

Holborn Exchange follow at the Holborn baths on Friday, Oct. 19, at which gala the L.T.S. Diving Championship will be the special attraction.

The L.T.S. Swimming Association will hold its Annual Gala at Pitfield Street baths on Friday, Oct. 12, when the usual full programme will be presented.

A new event is down for decision, the L.T.S. 66 yards' Breaststroke Championship.

There will be the usual heavy demand for tickets, and those who do not wish to be disappointed should make early application to Miss N. Temme, Trunk Exchange.

A BRIEF CHRONOLOGY FOR STUDENTS OF TELEGRAPHS, TELEPHONES AND POSTS.

BY HARRY G. SELLARS.

(*Continued from page* 240.)

1859 ... ... Cable between Great Britain and Denmark completed. July 14.

Thomas Allan patented a mechanical keyboard tape perforator and another in which a series of electro-magnets actuated the punches.

Jacob Brett's second attempt to lay a cable between Candia and Alexandria failed.

London District Telegraph Company formed and used overhead lines. It afterwards became the London and Provincial Telegraph Company.

Gaston Plantè invented the first secondary battery, the plates of which consisted of rolls of pure lead.

British Government voted a sum for cable from England to Gibraltar, but decided to lay a cable from Rangoon to Singapore to improve communication with China. Before the cable was completed the China War ended and the project was not carried out.

Mr. Sikes, of Huddersfield, revived the idea of a national savings bank and was supported by William Ewart Gladstone, Chancellor of the Exchequer, and Sir Rowland Hill, Secretary to the Post Office.

Total Post Office Staff in the British Isles, 24,802. 615,500,000 letters were dealt with.

1860, Feb. ... Bright patented duplex telegraph apparatus and a printing telegraph system.

1860, April 1 ... Packet service returned to the control of the Post Office, at the request of the Admiralty.

1860, April 25 ... T.P.O. established between London and Dover for sorting Continental mails.

1860, May 14 ... Communication with America, via the Faroes, Iceland, Greenland, and Labrador, proposed by Col. T. B. Shaffner before the Royal Geographical Society.

Dr. Antonio Pacinotti, of Florence, constructed an electro-magnetic machine and introduced the ring armature.

Z. T. Gramme introduced an armature of similar form.

Central Telegraph Office moved from Founder's Court. Lothbury, to Telegraph Street.

Clocks at Greenwich Observatory and London Bridge railway station connected electrically.

Bonelli devised an electric type-telegraph.

Varley "Mill" Repeater, installed at Amsterdam on Anglo-Continental circuits.

Everett, in Nova Scotia, showed variations in atmospheric electricity at various seasons.

Prof. Balfour Stewart showed the connexion between sunspots and magnetic storms. At Kew, he investigated the daily variations in atmospheric electricity.

Sir Edward Sabine discovered that there is a larger variation in magnetic declination every eleven years.

Emperor Napoleon III invented a battery composed of two plates of copper, one in sulphuric acid and the other in caustic soda, separated by a porous cell.

Minotto and Meidinger produced zinc and copper gravity batteries.

Pabst constructed a battery of carbon and iron.

Callaud, Chaperon and Grenet devised batteries of various kinds, while De Luc constructed a dry pile.

Gernez showed that in a bent tube containing positively and negatively charged liquids, the positively charged liquid crept over into the negative side of the tube.

Porrett observed that, when a current was passed through two liquids separated by a porous partition, part of the liquid in one section passed into the other.

Professor Quincke discovered that forcing liquid through a porous diaphragm set up a current. Showed that contraction is exhibited by resin and oily bodies under electrostatic stress.

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Glamond made an iron-galena thermo-electric battery which was used by the Submarine Telegraph Company and in the Central Telegraph Office, London.

1860, Aug. 1 ... Malta and Gibraltar began to pay as well as issue Money Orders.

New posts only set up when revenue covered the cost—calculating ½*d.* on each letter arriving.

Mail Guards abolished and assistant superintendents, overseers, sorting clerks and telegraphists, sorters, postmen and porters began to take the place of "clerks."

Arrangements made for sorting mails on steamers between Holyhead and Kingstown. Travelling Post Offices established between Dublin and Limerick, Dublin and Belfast.

1860, Aug. 29 ... Sir Charles Bright, assisted by Count Thaddeus Orzechowski (Senor D'Oksza) laid the Barcelona-Port Mahon cable.

Hughes improved the governor of his printing telegraph apparatus by adding a friction device.

Krajewski, of Moscow, added a coiled spring to the Hughes governor to obviate breakages of the suspension rod.

Philip Reis, of Fredericsdorf, transmitted sound by means of a transmitter consisting of a cube of wood hollowed conically, with the smaller end of the boring covered with a fine stretched membrane. Suitably fixed platinum contact points brought a battery into circuit in response to vibrations. The receiver was a violin with a knitting-needle fixed in the bridge. The needle was surrounded by a coil of insulated wire and became magnetised and demagnetised, emitting a slight sound which the violin reproduced.

W. H. Burnett patented a complete multiplex printing telegraph system using Bacon's five-unit alphabet, and introduced the "cadence" signal for operators.

Attempts to lay a cable between Toulon and Algiers failed.

Several attempts made to raise the Atlantic cable, which had been laid in 1858 and worked for only one month.

Suez-Aden-Karachi cable completed.

Sir Charles Bright, on behalf of the Magnetic and Submarine Telegraph Company, laid an Anglo-German cable and a cable between France and Jersey.

1860, Nov. ... Sir W. H. Preece supported observations made by Bright in 1859, relative to surveying, and discussed the merits of light and heavy sheathed cables.

1861, Feb. 8 ... House of Commons considered a plan for a Savings Bank which had been devised by Mr. Chetwynd, Book-keeper of the Money Order Office, and supported by the Receiver and Accountant General.

1861, Feb. 8 ... William Ewart Gladstone introduced, in the British House of Commons, preliminary resolutions on the Post Office Savings Bank Bill.

1861, May 18 ... Secretary to the Post Office announced the end of the Galway postal contract, the company having failed to comply with stipulations.

1861, May ... Money Orders for Malta and Gibraltar issued at fees ranging from 9*d.* for £2 to 3*s.* for £10, and for Canada, 1*s.* for £2 to 4*s.* for £10.

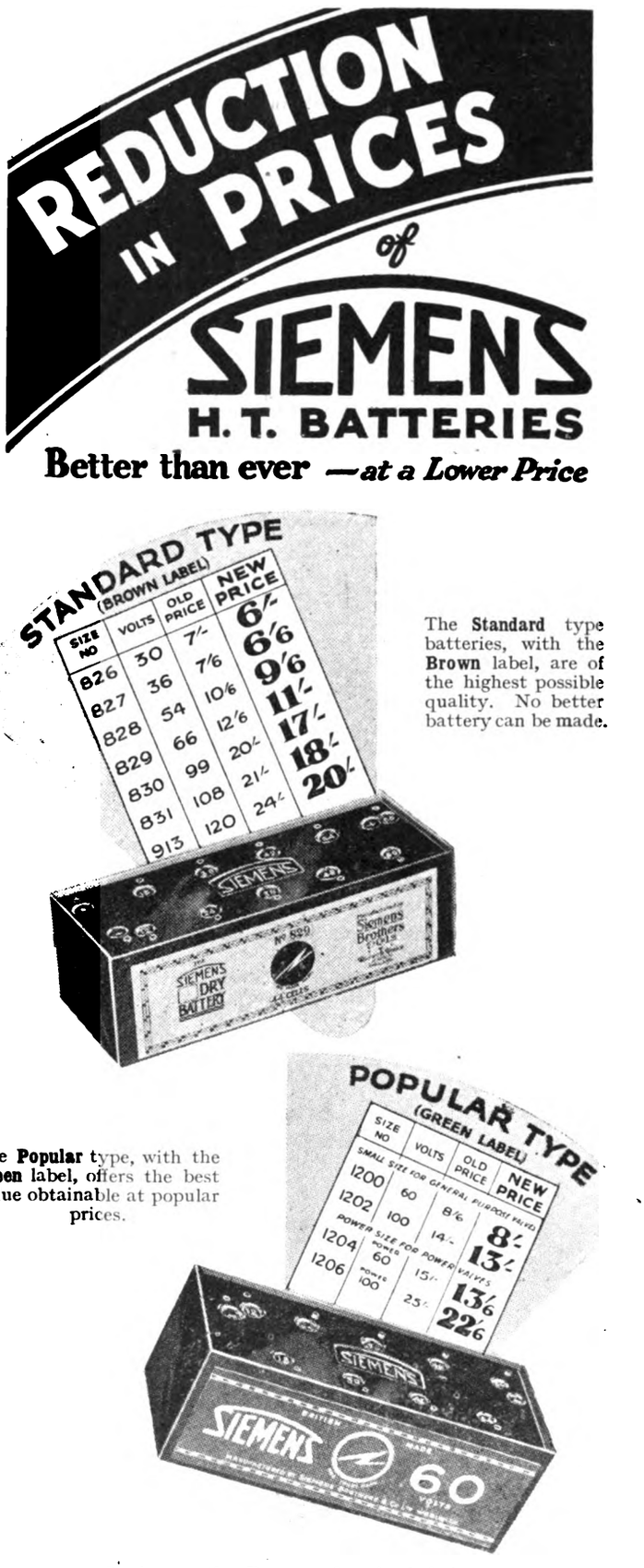
1861, May 19 ... Post Office Savings Bank Act passed.

1861, Sept. 16 ... Post Office Savings Bank commenced with deposits of 1*s.* or multiples of 1*s.*, the limits of deposit for individuals to be £30 a year, or £150 in all. Interest fixed at 2½% per annum.

1861, Oct. ... Foundation stone of a new Post Office laid by Prince Consort in Edinburgh.

Sir Charles Bright and Latimer Clark, in a paper read before the British Association, pointed out the desirability of establishing a set of electrical standards for practical use. After discussion, a committee was formed to determine a rational system of electrical units and to construct an equivalent standard measurement. The committee consisted of Sir Charles Tilston Bright, Sir Charles Wheatstone, Dr. J. P. Joule, Dr. Esselbach, Dr. Matthiesen, Prof. Williamson, Prof. Wm. Thomson, Prof. G. C. Foster, J. Clerk Maxwell, William Allen, Miller, Fleming Jenkin, Balfour Stewart, W. Siemens, D. Forbes, C. F. Varley, Latimer Clark and Charles Hockin.

Telegraphic communication established for conversation between Queen Victoria, at Balmoral, and the Princess Royal, at Potsdam.



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Johann Philipp Reis exhibited his telephone to the Scientific Society of Frankfurt-on-Main.

Caselli invented the pantelegraph.

Malta-Tripoli-Benghazi-Alexandria cable laid.

Blavier and Wartmann experimented with duplex and multiplex telegraphy, respectively.

Number of letters registered in the United Kingdom about 1,500,000.

1862, March ... H. C. Forde calculated that a speed of 8 w.p.m. could be attained on Atlantic cables if Thomson's mirror were used.

Léclanché, of the French Eastern Railway, devised a battery made up of carbon, binoxide of manganese, zinc and salammoniac.

K. W. Siemens introduced an electric arc lamp in which two solenoids regulated the positions of the carbons.

Serrin constructed a clockwork regulator to adjust the carbons of electric arc lamps automatically.

Ernest Siemens and Bright devised the "plate" and "ladder" lightning protectors for telegraph circuits, respectively.

J. B. Saunders designed a lightning protector for submarine cables.

1862, Aug. 1 ... Registration fee for Inland letters reduced to fourpence. All letters passing through London containing coin, registered compulsorily and double fee charged.

Cecil and Leonard Wray tried to improve the telephone apparatus devised by Philip Reis.

Sir Charles Bright and Latimer Clark examined the Aden-Karachi cable and were unable to find 100 miles intact, the outer covering having perished. They patented a preservative for cable which would resist the teredo and other boring seaworms.

Charles Bright perfected a curb telegraph key which effected more rapid transmission by neutralisation of residual electricity.

Lesaffre suggested partial discharge of submarine cables by momentary earthing between signals. (This arrangement works satisfactorily on the Toulon-Ajaccio Baudot installation.)

Needles of Needle Telegraph apparatus shortened and speed increased.

Derling constructed a single needle telegraph apparatus in which the needle was placed near an electro-magnet instead of a coil.

Neale produced an Acoustic Dial for use with single needle telegraph apparatus.

Spagnoletti devised coils for single needle telegraph apparatus, and induced needle galvanometer.

United States Post Office suggested a Postal Congress of all nations to discuss international postages, &c.

Foreign Pattern Post introduced.

Money Orders issued with commission, 9*d.* for £7, 1*s.* for £10.

Post Office Savings Bank had 180,000 depositors with deposits amounting to £1,750,000.

Estimated that 94% of letters were delivered at houses of addressees.

1863, Jan. 1 ... Fee on "registered" letters dropped into letter boxes reduced to eightpence and compulsory registration extended to the whole of the United Kingdom. Number of registered letters reached 2,000,000.

1863, Feb. 20 ... Pneumatic Dispatch Company started work. Mail bags sent through tubes from Euston station to Eversholt Street Post Office.

1863, May 11 ... Fifteen Governments met in Paris to discuss postal arrangements, as proposed by U.S.A.

Wilde devised magneto-electrical machine in which coils of wire, forming the armature, rotated between the poles of a large electro-magnet, which was excited by means of a small separate magneto-machine.

Committee of the British Association in London determined the value of an ohm.

Telegraph Conference at Bregenz at which Australia, Bavaria, Baden, Wurtemberg and Switzerland were represented.

Bonelli's type-telegraph used between Liverpool and Manchester.

Herman Ludwig Ferdinand Helmholtz, of Berlin, carried out experiments in the reproduction of sounds. Helmholtz calculated mathematically the effect of self-induction upon the strength of an electric current. He also constructed a galvanometer.

Maron devised the bridge method of duplex working.

Telegraph Act gave Postmaster-General certain wayleave rights for telegraph wires over public roads and streets.

Inland Pattern Post introduced, rates ranging from 3*d.* for 4 ozs. to 18*d.* for 24 ozs.

1864, March ... Sir Rowland Hill resigned from the Post Office.

Lenoir devised a writing telegraph system.

1864, April 25 ... Electrophone (invented by Dr. Strethill Wright) laid before Royal Scottish Society of Arts.

1864, May ... Cable between Persian Gulf and Karachi completed.

1864, June 6 ... House of Commons granted £20,000 to Sir Rowland Hill.

1864, Aug. 10 ... Post Office Insurance Bill received Royal assent.

Walther Nernst born at Briesen, Prussia.

Three attempts to lay a cable between Cartagena and Oran failed.

Siemens and Halske introduced a Morse telegraph transmitter in which signals were stored.

Free re-direction allowed in the case of letters, packets, &c., re-directed by the Post Office within the same "free delivery." The London Postal Service was regarded as one "free delivery."

Pattern Post rates reduced by one third.

Annual average number of letters passing through the Post Office, 630,000,000.

Musical sounds conveyed to, and reproduced by, harps on the stage of the concert hall of the Old Polytechnic, London, by means of wooden rods which connected the harps with the musical instruments played by artistes located in the basement.

1865, April 1 ... Postage rates above 1 oz. altered from 8*d.* for each ounce to 4*d.* for each half ounce.

1865, April 17 ... Life Insurance and Annuities obtainable through the Post Office in certain towns in England and Wales.

1865, July ... Shore end of new Atlantic cable fixed at Foilhommerum, near Valentia, Ireland.

1865, July 23 ... Shore end of new Atlantic cable spliced to the main portion carried by the *s.s. Great Eastern* (22,500 tons) in three iron tanks. Captain, Sir James Anderson; Engineer, Mr. Canning; Electricians, Sir William Thomson and Mr. C. F. Varley. Paying out began.

1865, July ... Fault discovered after 84 miles of Atlantic cable laid. 10½ miles of cable re-wound and fault removed.

1865, July 31 ... Fault found and repaired in Atlantic cable after 716 miles had been laid.

1865, Aug. 2 ... Another fault observed after 1,186 miles of the Atlantic cable had been laid. After being wound in for about a mile the cable broke and could not be recovered. Atlantic Company ruined.

Anglo-American Telegraph Company formed, and Mr. John Pender guaranteed a sum of two million pounds for a new Atlantic cable.

Abbé Caselli devised a method of tele-photography.

Vavin and Fribourg suggested a telegraph printer in which the printed letters were "built up" in response to certain perforations on the tape. J. Harris, Rogers, Favarger and others constructed apparatus on these lines.

Adam Millar, of Camden Town, suggested correcting variations of speed in distributors by means of gearing actuated by electric currents additional to, or part of, the working currents.

Maxwell published his theory on the propagation of electro-magnetic waves.

S. M. Yeates, of Dublin, constructed a telephone which was an improvement of that devised by Reis.

Favarger devised a single-channel telegraph distributor.

(To be continued.)

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THE TELEGRAPH AND TELEPHONE JOURNAL.

VOL. XV.

October 1928—September 1929.

LONDON: G.P.O. NORTH, E.C.1.

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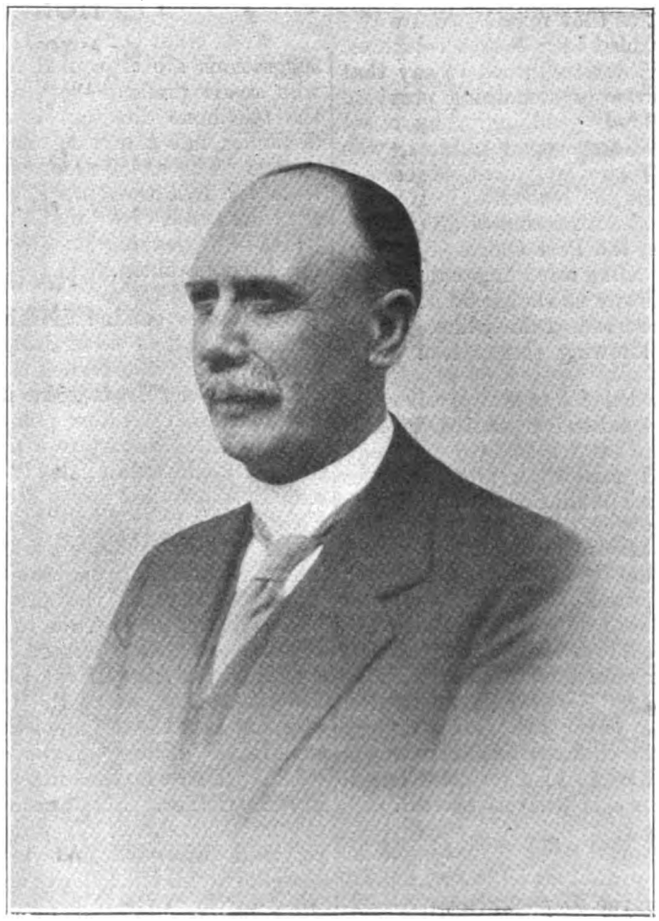
All correspondence relating to advertisements should be addressed to MESSRS. SELLS, LTD., 168, *Fleet Street, London, E.C.*4.

TELEGRAPH AND TELEPHONE MEN AND WOMEN.

LVII.

MR. W. E. GAUNTLETT.



MR. W. E. GAUNTLETT, the present District Manager of Telephones in Liverpool, began his career as a telephone man in April, 1887, when he entered the service of the Western Counties & South Wales Telephone Co., at Gloucester, as a learner. No telephone exchange yet existed in that town, nor in any other town in the whole district lying between Bristol and Birmingham. Mr. Gauntlett acquitted himself so well that in 1892 he was appointed Local Manager at Gloucester. In 1896 (the Western Co. having by this time been merged in the National Telephone Company) he became Local Manager at Bristol and took part in the conversion of the Bristol system from overhead to underground and from magneto to common battery working. Bristol, it may be observed, was the first town in England to be converted to the C.B. system. On July 1, 1900, he was promoted to the post of District Manager in the newly formed Gloucester District. The year 1906 saw him District Manager in the more troubled atmosphere of Swansea, where a lively competition with the short-lived municipal telephone system was raging. In 1917 he returned to Gloucester again, but in 1926 after having spent so far all his telephone days in the West Country, he began a period of nearly five years' District Managership in Western Scotland. In August, 1926, his solid merits procured him the important post of District Manager for Liverpool, which district, as our readers know, comprises S.W. Lancashire and most of the Wirral peninsula, and is, as regards the number of telephones it comprises, the third largest provincial district. Mr. Gauntlett has probably been concerned in the opening of as many or more telephone exchanges than any other existing District Manager. He is conspicuously successful in maintaining good relations with public bodies, and his tact in this connexion has often stood the Post Office in good stead.

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INEFFECTIVE CALLS.

(RECOVERING THE WASTE.)

BY A. E. HIGGENS, ASST. TRAFFIC SUPT., GLASGOW.

INEFFECTIVE calls, like the poor, will always be with us. It is obviously impossible to ensure that at no time will two different subscribers simultaneously desire to speak to a third, and that no one will call a house or office which happens to be temporarily untenanted. There are, however, a large number of ineffective calls which are not unavoidable, and which can be ascribed to shortcomings of one sort or another on the part of the telephone staff, apparatus or subscribers.

Now as regards the first two of these factors, no stone is left unturned to see that the staff is adequate to deal with the traffic, thoroughly trained, and understands the apparatus—and subscribers—as far as is humanly possible, and that the apparatus is sufficient and maintained in good working order. But what of the third element in the case, the great British Public ?

The proportion of ineffective work which could be eliminated by the Department alone is comparatively small, and most of this is due either to sheer misfortune or to the fallibility of the human element.

It is clear, then, that any substantial reduction in waste work can only be achieved with the full co-operation of the public. Is enough being done to secure this co-operation ? Or, perhaps it would be more pertinent to enquire : Are we setting about it in the right way ? It will be readily admitted that subscribers do not co-operate with the Department as they might. And why ? Is it not because they have a very garbled idea of the Telephone Service and all that it involves ? It is not too much to say that the average subscriber regards the service as something provided for his own special benefit, administered, grudgingly, by a set of semi-human automata with a few stereotyped phrases, who require compliance with certain rules (and payment of certain sums) without even deigning to explain the reason. He remains in blissful(?) ignorance of the fact that the rendering of an efficient service depends on him no less than on the Post Office. Now the average Britisher is not averse from lending a helping hand if he knows what he is being asked to do and why he should do it. He is apt to object, however, to being ordered, soldier-like, to do apparently objectless things without knowing the reason.

What, then, can be done to dissipate this fog of misapprehension and misunderstanding, and to give the subscriber an insight into the part *he* is playing in the telephone service ? Is it not high time that official rigidity was relaxed somewhat, and that the Department came off its perch and took the public into its confidence?

In Glasgow last winter lectures on the Telephone Service, with practical demonstrations on a model switchboard, were given to a number of societies. These proved somewhat of an eye-opener to the four thousand people who were reached by this purely voluntary effort, and have undoubtedly led to a better understanding of what is involved in the everyday telephone call. But what is 4,000 among the users of upwards of 50,000 telephones in the area ? And how long would it take to cover the whole country by this method ? If the public are to be educated into the proper use of the telephone the problem must be tackled on a far larger scale. Some systematic propaganda work is what is needed.

Let us consider what channels are open for such propaganda. These include (*a*) the Press, (*b*) public lectures and (*c*) the periodical communications sent to subscribers by the Department.

(*a*) The Press.—Here we have a vast field of opportunity practically unexplored. I do not for one moment suggest that we should lower ourselves to reply to the petty spite or alleged humour of the anonymous letter. But far too often is reasoned criticism, which would not arise were the facts of the case known, allowed to pass unchallenged, with the result that the public are left with a still more deeply rooted impression of official "obduracy" and "hopelessness," when a statement of the other side of the case from the pen of some responsible officer would have cleared away misunderstanding. If instead of the virtual interdict on journalism, contributions to the public Press (approved by responsible authority before being submitted for publication) were encouraged, much might be done to stimulate intelligent interest in the service on the part of the public and so lead to a more efficient use of the telephone.

The same remarks apply to the newest publicity medium—broadcasting. It is surely ironical that one department of the Post Office cannot do something to help another.

(*b*) The Lecture.—This is undoubtedly the method of getting into the most intimate contact with the public, of meeting their point of view with ours and of enlightening them as to the reason why things should be done. On the other hand, it entails a vast amount of work and preparation on the part of the lecturer, while the number reached is comparatively small in relation to the effort involved.

(*c*) There remain the communications sent by the Department to subscribers. Chief among these are accounts and directories. Now perhaps it is not exactly tactful to couple education with demands for money, though I believe it is the practice in some quarters to send with the accounts leaflets setting forth the inestimable benefits of extension telephones, so perhaps a few practical hints on how to get the best out of the service might not come amiss.

And what of the Directory ? Some doubtless excellent suggestions are embodied in the preface to this document. But who reads prefaces—leaving out of consideration the fact that the telephone directory is a book to be referred to as occasion demands, not a literary masterpiece to be studied from cover to cover ? The exact practical value of this preface can be gauged from the fact that practically 100% of one's calls to the public are answered by that irritating, meaningless, time-wasting "Hal-l-lo," leaving one to enquire whether the correct number has been obtained.

But why confine the hints to the preface ? Why not devote a line or two of advertising space on each page to some short, eye-attracting slogan such as "Unnecessary remarks mean engaged numbers," or "Insufficient lines mean lost calls. Lost calls mean lost business." A few pointed hints like these put one on each page of the directory in a position where it would be seen, would gradually sink in and slowly but surely produce a response. What should be avoided is the stiff, formal, unexplained request.

Apart from the overloading of lines and the general time-wasting which amounts to the same thing, perhaps the greatest source of waste work is the private branch exchange. Here, again, difficulties are largely due to lack of knowledge of what is involved. In some cases the operator does not know how to manipulate the board, giving rise to cut offs, double connexions, "L.G.'s" and the like. But where the manipulation is fully understood the operator is often the unwitting cause of lost calls and other waste work. For example, perhaps the operator is engaged on one line with a person who does not know what he wants, when a call comes in on another. She finishes the conversation before attending to the second call, on which "No reply" has meanwhile been reported. The caller, knowing there must be someone in attendance, disbelieves this and lodges a complaint, thus adding more unnecessary work to that of the lost call. Or else the second call is plugged

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out, giving a signal at the exchange to the effect that the call has been answered. Hence there is no supervision, and the caller either complains of delay and inattention, or abandons the call, which is recorded as effective. All private branch exchange operators should be thoroughly instructed, not only in the details of manipulation but also as to their responsibilities in connexion with calls, particularly as to the need for answering incoming calls (at the expense of interrupting any conversation in which she may be detained) and for clearing, as quickly as possible. It is not sufficiently realised by the renters of private branch exchanges that the working of these installations can do much to make or mar an efficient telephone service, and that it is their duty to see that they are properly attended by trained operators.

In short, it is my confirmed opinion that the chief hope for a substantial reduction in inefficiency lies in the education of the public to play their part in the working of the service. It is of little use repeatedly telling people what you want them to do. They may remember to do it, or they may not. But take them into your confidence, give them credit for a little intelligence, tell them why they should do it, make them realise that they can help you to help them, and they are far more likely to respond.

The rigid official attitude may be the only possible one to adopt in some cases, but it certainly seems that it might be relaxed with advantage now and again, especially in a case like this where there exist so much misunderstanding and so many erroneous ideas which might be removed, and whose removal cannot but lead to a more intelligent and, *ipso facto*, more efficient, use of the service.

PERSONALITY AND THE CALLING RATE.

BY R. S. GROSVENOR, Gloucester.

THERE are many good reasons that can be advanced for the general decrease in the calling rate, from trade depression and the consistently increasing popularity of the motor-car, to the mentality of the person who refrains, as far as possible, from using the telephone because his grandfather managed without.

Comparing the January 1928 Operating Statistics with those taken in January, 1927, the drop in the general calling rate by 3.5% is accounted for to the extent of 50% by the increase in residential lines and transfers from magneto to automatic working, and the other 50% by a general drop in the calling rate, greatly influenced, as it is supposed, by trade depression.

Our business, however, is to endeavour by every means in our power to turn the decrease in the calling rate into a consistent increase. It is a problem to be solved, something to achieve, and surely worthy of a big effort on the part of all telephone women and men. It will be observed the ladies are placed first in this case, not only as a matter of etiquette, but for a reason which will be abundantly clear. The problem can be effectively dealt with in the exchanges in addition to public propaganda.

What can we do about it? The great thing appears to be to sell our inexhaustible stock of calls in a more attractive manner.

A good average speed of answer in operating is essential, but after all that is only the commencement of a satisfactory service. It is equally necessary to see that the calling party is as satisfied on the completion of a call as at the commencement, but even that is not sufficient. To increase the calling rate, users of the telephone should be *encouraged* in every possible way to use it again, make a habit of it, and to quote the now somewhat worn slogan "Say it by Telephone."

The telephone is an essential factor in the life of the community and it is our business to see that this fact is much more fully recognised.

The Contract Officer eloquently explains the necessity for and advantages of the service. The order is obtained, and when connected the subscriber should be at once encouraged to forget his natural inclination to conserve calls by giving him such a completely satisfactory service that more and more calls than were ever intended are made. A most important feature, especially on the operating side is, undoubtedly, *personality*. It is not easy to introduce this for we are handicapped. Our customers do not come into a carefully prepared atmosphere, meet a very obliging shopwalker and are passed on to an equally obliging assistant. No! our customers are in their own offices or homes or call offices very often full of business, or worried and requiring urgent attention. They cannot (at present) see what is going on and have little or no idea how many customers are waiting to be served with equally important calls at exactly the same time.

The rising inflection, the courteous and confident manner, the complete supervision of the call, the ability not only to please but inspire confidence is, generally speaking, within the power of every telephone operator. Can we not treat every calling party in a more personal manner, *sell the call*, and sell it in such a way that users will be encouraged and, in fact, drawn to the telephone.

An operator's life is not a bed of roses, but nothing really worth while is easy to achieve and, after all, telephone people have their hearts in their work. There is no doubt it will be generally agreed that a more personal touch will do much to stimulate the calling rate.

It is quite recognised that it is one thing to write an article and another to operate at a busy switch section, but the ideal really aimed at will have every chance of success. Experience has proved that telephone operators can always nobly rise to an occasion.

Every telephone operator is a saleswoman or salesman and the success of the business is in their hands. To deal with telephone users in such a way as to encourage and increase business is our plain duty. The point of view is all-important. If this is right, the essential personal element will be there and, in consequence, users will come along with calls in ever increasing numbers.

With automatic systems now steadily spreading over the country, it is more than ever necessary to see that the personal touch is maintained in operating. This sounds paradoxical, but it really is not. The calls dealt with at a manual board used in connexion with an automatic system are the more expensive calls, and if sold to users in an attractive manner cannot help but encourage the more general use of that system. The majority of the calls, however, will be completed automatically, the caller being his own operator. Here in the case of assistance traffic, the personality of the manual operator is of extreme importance.

Personality in operating and the calling rate are even more closely associated than the shopkeeper and the customer. If the personal element is lacking, say, in a shop or even in a Post Office, a member of the public has an alternative, and can go elsewhere, but he cannot, by taking thought, change his telephone exchange.

In the case of exchanges serving residential neighbourhoods where a large proportion of users are leisured people, an impression of confidence, an impression that we are seeking their custom, and are anxious to serve them by showing a real personal interest in their requirements will go a long way to achieve the desired end.

A strong combined effort on these lines and the calling rate should soon be showing improvement. Optimism—certainly! With an operating force such as possessed by the department, and the more intensive cultivation of "the voice with a smile," the calling rate can be stimulated.

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TELEGRAPHIC MEMORABILIA.

AUSTRALIA.—Mr. H. P. Brown, Director of Posts and Telegraphs, on his return a few weeks ago from a tour in Europe and America, stated in an interview with a representative of Reuter's Agency, that he was anxious to introduce regular wireless telephony between Great Britain and Australia.

The business communities were, he said, reaching out for the new facility, but an early difficulty would be the synchronisation of the times, as only two or three business hours out of the twenty-four coincided. Mr. Brown added that all the new developments of wireless telephony and television would be introduced into Australia within a reasonable time.

About a week later the Canberra correspondent of the *Daily Telegraph*, London, cabled that Mr. Brown forecasts considerable advances in broadcasting, as well as in telephonic communication in Australia. He declares that the establishment of relay stations in country centres is imperative. "Australia," he says, "has a modern system of telephone trunk lines, which can be used to transmit from the capital cities programmes from main broadcasting stations.

"Sir John Reith placed the results of the British Broadcasting Corporation's investigations at the disposal of Australia to enable us to benefit by the experiments in Britain." He also added, "I feel strongly that the proposals of the Imperial Wireless and Cable Conference are sound, and if adopted and developed in the proper spirit they will re-establish the predominance of British communications."

From Ballarat we learn that "the Postmaster-General's department has asked the Dominion Broadcasting Co., Melbourne, to arrange for the establishment of a relay broadcasting station at Ballarat. A telephone circuit is now available for transmission of the programmes." And from Canberra, through Reuter, we are given to understand, Mr. Bruce has announced that the Government does not intend constructing a high-power wireless station at Canberra, as advocated by high military officers as a war precautionary measure. Mr. Bruce, we are given to understand, replied in terms which practically meant, the situation does not arise!

Victoria.—The *Electrical Engineer of Australia and New Zealand* reports that for the first time since wireless broadcasting became a national entertainment in Australia there has been a decrease in the number of listeners' licences in Victoria. Returns for the month of May show that the number of licences which were not renewed in that State was over 200 in excess of the new licences issued during the month. In all the States except Victoria and West Australia the excess of new licences over cancellations was maintained last month. The total number of licences in force in Victoria is now 136,496, and the number throughout the Commonwealth is 267,178.

New South Wales.—The New South Wales Broadcasting Co., Ltd., has been formed in Sydney, with authorised capital of £100,000, for the purpose of taking over and operating the "A" class broadcasting stations now controlled by Farmer's (2FC), Ltd., and Broadcasters (Sydney), Ltd., (station 2BL). Some of the directors are associated with the Dominion Broadcasting Co. Pty., Ltd., which recently took over the "A" class stations in Melbourne. The Sydney stations, like those in Melbourne, will retain their individuality, but the programmes will be so arranged as to avoid duplication.

The following three paragraphs are excerpted from an Australian letter to the London *Electrician*:—

"In the wireless world, the principal topic of conversation last month was the expressed intention of the Federal Government to assume control of 'A' class broadcasting, calling tenders periodically for the provision of programmes. There are two classes of broadcasting station in Australia. The 'A' class, which receive their revenue out of listeners' licence fees and are not permitted to broadcast advertising matter; and the 'B' class stations, which receive the whole of their revenue from advertising.

"There is much curiosity as to the effect which the announced wireless and cable merger will have upon Australian services, for Australia's wireless services are controlled by Amalgamated Wireless (Australasia), Ltd., formerly a subsidiary of the Marconi interests, but now controlled by the Federal Government, which holds a majority of the shares.

"Australians, by the way, are led to expect that within the next year or two the beam stations of Amalgamated Wireless (Australasia), Ltd., will be giving telephone as well as telegraph communication with the Motherland.

AUSTRIA.—The Vienna correspondent of *The Times* reports that figures just published by the Austrian Broadcasting Company bear witness to the great popularity of the service in Austria. During the past 12 months the number of listeners increased by 45,875, bringing the total number of subscribers to 293,408. The subscription collected by the company is graded according to the income of the head of the household, or the unmarried subscriber, with a minimum fee of 1*s*. 2*d*. per month on monthly earnings below £20 10*s*., and 3*s*. 6*d*. if above that figure. The biggest licensing fee is paid by dealers in receiving sets or parts domiciled in cities with more than 20,000 inhabitants. Their lowest rate is 11*s*. 8*d*. for one loudspeaker or five head telephones used for the benefit of their customers.

BELGIUM.—Brussels was the focus upon which the whole telegraph world was centred last month when what was practically a huge sub-committee of the first post-war International Telegraph Conference, held in Paris in 1928, met on Sept. 10 in the Belgian capital. The British Post Office delegates were, Mr. F. W. Phillips, Mr. J. Louden and Mr. F. Strong—a strong team—no pun intended!

For the first time in the history of international telegraphy, international commercial interests were represented, although in 1926 in Berlin, private telegraph manufacturers, Creed, Siemens and the Standard Telephone Coy., were permitted to attend, and as in the present case, had no vote.

The International Chamber of Commerce was asked to attend the Congress to represent world users of communications. After careful inquiry the Chamber decided to demand that if the number of letters in code words was reduced by half, the rate should also be reduced by half. The president of the International Chamber was represented by Sir John Sandeman Allen, M.P., as head of the Transport and Communications Group of the International Chamber. The delegation was headed by Mr. Robert E. Olds, former American Under-Secretary of State, the other members of the delegation being Mr. Ed. Dumoulin (Great Britain), Dr. Luschen (Germany), Mr. Odier (Switzerland), and Mr. Henri Story (Belgium).

This was an innovation which should have considerable enlightening influences upon the business world, which speaking from no small personal knowledge has never, as a whole, been able to understand why Anglo-foreign rates should not be decided by Great Britain, always taking as their standard the American transatlantic cable services. Over sixty countries were represented.

As is well known the main subject was that of Code Words. One of the proposals under discussion was to reduce the number of letters allowed in code words from ten, as at present, to five; the rate, however, would only be reduced by 30 or 40%, thus increasing the cost to business men. On the other hand, it was proposed that rates for ordinary telegrams should be reduced.

According to a Reuter telegram from Brussels, Sir John Sandeman Allen, M.P., speaking on behalf of the President of the International Chamber of Commerce, said that the substitution of code words of five letters for the present limit of ten letters was not desired by commercial interests. He declared that it would be unjust to impose a new charge upon international commerce, which already had many burdens to bear. If the length of code words was to be reduced without any corresponding reduction in charges there would be an almost unanimous opposition from the business community.

It is worthy of note that the Brussels gathering resolved to continue the use of French as its official language, but authorised interpreters to furnish explanations if desired.

As I close these notes comes a semi-official note to hand from Brussels to the effect that the proceedings of the Conference were brought to an end on the morning of the 21st ult., the British, French, and German delegates congratulating the Conference on the results achieved.

BOUVET ISLANDS.—There has been a slight flutter in the London Press on the report that a Norwegian wireless station is to be established on Bouvet Island, the cost of which is being defrayed by Consul Lars Christensen. According to *The Times*, the complete apparatus, including buildings and masts, has been ordered and M. Otto Rogne, for the last four years manager of the wireless station at Advent Bay, has been appointed manager of the station, with two assistants. With his assistants and the wireless outfit, he will leave Sandefjord on Oct. 1 in the floating factory *Thorshammer*. Owing to the importance of Antarctic meteorological information, especially to the agriculture of South Africa, America, and Australia, the construction of a permanent wireless station on Bouvet Island is likely to attract general attention. Bouvet, which is a remote island in the Southern Ocean, has recently been claimed by both Great Britain and Norway; no announcement has been made of a settlement of the claims.

The history of the island according to the official records in London is briefly as follows:—

"Discovered in 1739 by M. Bouvet, a French navigator, it was afterwards, in 1812, occupied for one week (!) by an Englishman, Captain Morrison by name, who called it Liverpool Island. Thirteen years afterwards it was sighted by the *Lively* and the *Sprightly*, two British Government boats.

"Two things seem to emerge from the tiny tangle (1) that it is admitted that such a station, reporting regularly on meteorological conditions, would be of special value to agriculture in Australia, South Africa and South America, (2) that in January of the present year 'the British Government granted to a Norwegian firm an exclusive licence to occupy the island.'"

BULGARIA.—The *Board of Trade Journal* states that among the goods which are exempted from the increased duties recently imposed upon goods entering Bulgaria are the following: Dynamos, motors, transformers and parts; telegraph and telephone apparatus, electrical measuring apparatus and heating apparatus; electric cables and wires; materials for electrical installations; and tramway carriages. These will continue to be subject to the duties at the rate of 15 paper levas to the gold leva.

ECUADOR.—From Quito, through Reuter's Trade Agency, we learn that a presidential decree has authorised the erection of a wireless station at the port of Limones and an initial appropriation of 11,760 sucres (1 sucre = 2*s*.) has been passed for its construction. The first wireless station was erected at Guayaquil in 1913, and since then the Marconi Company has constructed a station at Santa Elena Point with a range of over 500 miles. There are radio-telegraph stations at Quito, Guayaquil Port and Esmeraldas, constructed by La Societé Française Radio Electrique, of Paris, on the tuned-spark system. The stations at Quito and Guayaquil are of 10 kw. with antennas of 100 metres.

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and that at Esmeraldas is at present 5 kw. with an antenna of 50 metres; at both the umbrella type has been adopted. It is proposed to increase the wireless stations in Ecuador to 12, including one for inter-continental service.

GERMANY.—It is reported in the British daily Press that the German Post Office has bought up the entire German rights of the new television apparatus of the Hungarian inventor Denes De Mihaly, with the intention of giving a television service to holders of radio receiving licences. If the report proves to be correct it will be the first instance of a European Government officially adopting television as an adjunct to radio-telephony.

The British Broadcasting Corporation, London, announces that the Council and the various committees of the International Union of Radiophony, which, at the invitation of the Reichs-Rundfunk Gesellschaft (German Broadcasting Company), met in Berlin on Aug. 31 last, concluded their work on Sept. 5. The Council recognised that it was now advisable to attempt a revision of the friendly agreements for the allocation of wavelengths in Europe in order that European Governments, having in mind the ratification of the Washington Convention, might make the most efficient use of the waveband reserved by this Convention to broadcasting. The Council took note of the work done by the Rome Conference in revising the Berne Convention copyright. The Conference has permitted each Government to lay down in its own country a favourable formula for the exercise of this right in the case of broadcast works. The Council likewise followed the suggestions of the Rapprochement Committee for the establishment of uniform monthly statistics, with the object of gaining the greatest possible advantage for listeners from the artistic and educational efforts of the different countries.

Short waves—their use and abuse, might well be the headline for a report of the Berlin correspondent of the London *Daily Telegraph*, who cabled recently as follows regarding a lecture by Professor Esau, of Jena University, who addressed one of the German scientific societies recently in Bremen, on the results of his experiments carried out during the last twelve months, with ultra-short waves, viz, 3 metres and under :—

"In the field of communication," says the correspondent, "he succeeded with a fraction of a watt, using ordinary broadcasting tubes without antennæ in covering distances of 25 kilometres (15½ miles) and more. With higher energy he increased this distance to 400 kilometres (250 miles), and he hopes in the early future to extend it to 500. He also succeeded in telephoning with these short waves. The sender he employs is no larger than a cigar box, and 'he has constructed a receiver which solves with amazing simplicity the problem of detecting ultra-short waves.'

"Professor Esau had already used ultra-short waves to kill mice, rats and rabbits, but he has now demonstrated their therapeutic value. Of 30 mice which had been inoculated with tuberculosis, half were exposed to ultra-short waves and the other half were not. The latter gradually sickened and died, whereas fifteen treated with the waves "remained as fresh and lively as before inoculation." Careless treatment with ultra-short waves may, however, be dangerous to human life, in consequence, as the Professor believes, of the transformation of albuminous substances which it causes in the body. When a human being is exposed to the influence of these waves, his temperature rises one degree per second. Herr Esau also found that bleeding wounds rapidly closed and cicatrised when treated with ultra-short waves."

Much has been made of the experiments during the German President's visit to Kiel of the wireless-controlled movements of the old 12,000-ton battleship, the *Zaehringen*, by the British press, which in some cases, at any rate, appears to have already forgotten that, as the Naval Correspondent of the *Telegraph* reminded its readers, "as far back as 1919 the American naval authorities converted the old battleship *Iowa* into a radio-controlled target ship, and very soon afterwards the British Admiralty did the same with *H.M.S. Agamemnon*. Both these vessels were quite successful. The *Agamemnon* served as fleet target ship for six years. Without having a soul on board she could be made to steam through a wide range of speeds, to stop, go ahead or astern, and perform a number of evolutions."

In fact the *Agamemnon* has already been scrapped, and the *Centurion*, a much larger ship, has been similarly equipped with the latest improvements in the way of distant control. Actually the naval Robot has been a *fait accompli* for nearly a decade!

Similarly, the use of the "invisible ray," also recently reported as a novelty which was, I believe, first made public by Professor McLennan, also in 1919.

Fortunately, the latter invention may prove one of the new *Arts as applied to Peace*, for it is certain to play a most important part in the increasing of safety at sea, as it is equally efficient by day and night and also in the thickest fog.

GREAT BRITAIN.—Thanks to the "Regenerator" system so successfully extended and worked over the Eastern Telegraph Company's system during the last twelve months or more, London and Bombay have now been placed in direct telegraphic touch. In addition to enabling the company to give a quicker service it is obvious that there must be a decided saving of staff by this elimination of human aid for re-transmission purposes, at so many points over the company's system.

There would sure to be a certain number of the personnel who are approaching pensionable age and one would not be surprised to hear of any redundancy being met by premature retirements on generous terms.

The expenses on plant due to the installation of the "Regenerator" system have included a new cable or cables between Alexandria and Port Said, as well as multiple core underground cables beside the canal from the Mediterranean end into Suez itself. Heavy as such initial expense may be, the deterioration of plant is not likely to proceed at an abnormally rapid rate.

The laying of the Western Union Cable Company's new and high-speed cable connecting Bay Roberts, Newfoundland, and Horta, Fayal, Azores, was effected a few days earlier than anticipated in last month's "Memorabilia."

The Telegraph Construction & Maintenance Co., London, manufactured and laid the cable, which represents a distinct departure from the usual deep-sea cable. A special alloy has been used in its manufacture. It is interesting to recall that it was in the summer of 1858—just 70 years ago—that Americans assembled to honour Cyrus Field and his companions on the completion of the laying of the first transatlantic cable.

The present cable was laid by the British cable ship *Dominia*, which completed the task of laying the deep-sea portion in six days, despite the fact that at one time for a period of 24 hours it was impossible to take sights owing to cloudy weather. Nevertheless, the chartered route was maintained with absolute precision. The last part of the work was carried out in a howling gale, and the deep-sea end was buoyed 20 miles off Horta on Aug. 30.

When the weather abated the shore end was spliced, and communication was established with New York, via Bay Roberts, just eight days after the *Dominia* started on her voyage from Newfoundland. The new line will be brought into commercial operation as soon as the necessary engineers' tests have been concluded.

The Azores—the telegraphic Clapham Junction—has therefore yet another and perhaps the fastest submarine cable service with the United States of America, and by means of the direct cables serving Germany, Italy, Spain, Portugal and Africa should be able to give these countries a 24-hour cable service of indisputably good quality—and let it be admitted a very strong rival to wireless means of long-distance communications in the "pull baker pull devil" struggle between the two methods now proceeding.

The return from the United States of the Post Office party of five officials who left our shores on the 8th ult., will be awaited with more than usual interest and not without a certain amount of natural curiosity. As is generally known, the party was headed by Mr. L. Simon, Asst. Secretary in charge of the British Inland Telegraph Service, Mr. J. Stuart Jones, Controller of the C.T.O., Lt.-Colonel A. G. Lee, Asst.-Engr.-in-Chief, Mr. G. T. Archibald, Inspector of Telegraph Traffic, and Mr. A. E. Stone, Asst.-Engineer on the E.-in-C.'s staff. The visit is being made as the result of one of the recommendations of the Hardman-Lever Report on the Inland Telegraph Service of Great Britain.

The wireless world in all its various sections has been much moved by the two decisions of the Comptroller-General of Patents upon the applications for compulsory licences made by the Loewe Radio Co., Ltd., and the Brownie Wireless Company of Great Britain.

The applications were made early in August, but the decisions were not given until late in the same month, and on broad lines were respectively as follows :—

In the case of the Loewe Company, the company should receive a licence from the Marconi Company to manufacture Loewe valves in this country and that the royalties should be 7*s*. 6*d*. on double valves and 10*s*. on triple valves, the amount to be paid on other multiple valves to be assessed at the rate of 5*s*. in respect of the first unitary valve and 2*s*. 6*d*. for each additional valve. The Tribunal stated that the royalties proposed to be charged by the respondents, viz., £1 17*s*. 6*d*. and £1 5*s*. on the triple and double valves, respectively, and £3 2*s*. 6*d*. on long-range sets, were too high, and were prejudicing the establishment of a new industry in this country. It is noted that not one of the five patents in question was for an invention originating with the Marconi Company, but the latter had gathered them into its own hands and established a kind of "super-monopoly." The respondents, the Marconi Company, had certainly expended large sums of money in radio development, however, and were entitled to some reward. A period of 21 days has been allowed (from Aug. 24) for the submission of an agreed form of licence. Failing this, an order will be made by the Comptroller-General.

As regards the Brownie Company claim, the Tribune expressed its opinion that the monopoly rights under the respondents' patents had been abused, and it was necessary to consider the question of relief. It was therefore decided that the Brownie Company should be given a licence to manufacture receiving sets under the patents in question, the royalty to be 10% of the wholesale selling price, with a minimum of 5*s*. for the first valveholder and 2*s*. 6*d*. on each subsequent holder. If the parties could not reach an agreement in the matter, it would be necessary for the Comptroller-General to make an order giving effect to the decision. The Tribunal pointed out that in addition to the specific case before it the general question of the granting of licences on reasonable terms arose, but upon that it was unable to go further than to define the relief to which the present applicants were entitled.

The Electrical Review, in a leading article on these decisions ordering the Marconi Company to grant licences for the manufacture of receiving sets under considerably reduced royalties, remarks :—

"The decision is a momentous one. It has been generally felt that the existing royalty is too great; with the cheapening of production it represents a very considerable proportion of the total cost, especially in the low-priced sets.

"Although the decision applies so far only to the applicants in the case, there is no doubt that the principle will have to be extended to all licensees

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under the patents involved, and the result should be a considerable impetus to the sale of receiving apparatus. It seems safe to say that the crystal set will be superseded even in many poorer homes."

The matter is not settled yet, for the Marconi Company apparently intend to appeal against the decisions. At the same time the latter company has made it clear that if the decisions are confirmed by the High Court (the final point of appeal), other manufacturers than the two appellant companies will be able to obtain licences on similar terms as from the date of the confirmation.

As, according to the *Wireless World*, there were nearly 200 valves, either entirely of a new type or comparatively old with improved characteristics on exhibition at the National Wireless Exhibition held at Olympia last month, it is not difficult to agree with the *Review* that the decisions if confirmed may well be described as momentous.

As we go to press, it is interesting to note that some of the big London stores are not waiting to hear the result of any further possible appeal but have already reduced valve prices by as much as those mentioned in the Comptroller's decisions.

Aberdeen.—For the first time picture transmission by wire was carried out between England and Scotland on the 14th ult., when pictures of the Braemar gathering were "wired" to London for the *Daily Sketch*, and subsequently published in the pages of the latter paper. The Belin system of telephotography was used.

Glasgow.—A site has been provisionally selected for the erection of a B.B.C. high-power regional broadcasting station near Glasgow. If, as is anticipated, the plans are passed by the Postmaster-General within a week or two, work will commence on the new station almost immediately. A start has already been made at the site of the London station at Potters Bar.

Manchester.—The next station to be built will be one near Manchester, and by the end of 1929 the new London and Manchester stations should be in full working order, says the *Daily Telegraph*. Plans for the other stations will soon be put into operation. The Regional Scheme is expected to be complete by 1930.

Portsmouth.—A curious point of law! At Portsmouth County Court, on Aug. 16, the Postmaster-General claimed damages from William Latter, licensee of the King's Head, Wickham, for injury to telegraph wires consequent upon a fire at his premises in October last, caused by the defendant falling on the stairs while carrying a paraffin lamp. The heat from the fire reached the telegraph wires in front of defendant's premises. It was contended that the lamp was dangerous.

The Judge said that if the Act applying to the case did not protect a man when simply carrying an ordinary lamp, it seemed to him to be a farce. He dismissed the action with costs, but gave leave to appeal.

Broadcast radio-receiving licences current in Great Britain at the end of June, 1928, numbered 2,511,736, an increase of 5,477 during the month of June. The following interesting figures, issued by the Bureau Internationale de Radiophonie at Geneva, are an indication of the approximate number of licensed listeners in some of the countries of Europe: Austria, 293,408; Denmark, 214,734; Hungary, 98,011; Lithuania, 9,407; Norway, 64,722; Switzerland, 66,731; Sweden, 357,828; Czecho-Slovakia, 225,501.

Some interesting details of exports of radio apparatus from this country during the first half of the current year have been published by the *Wireless Trader*. From these it is seen that the total value was £586,322, as compared with £643,938 in the first six months of 1927. Our leading customer was again Australia, but its share declined from £124,950 to £76,332. Japan fell to third place. A large increase—from £25,419 to £46,226—placed France second in the list. Other important customers were the Netherlands (£37,281 against £35,055), South Africa (£33,281 against £10,526), India and Burma (£30,966 against £43,924), the Irish Free State (£22,622 against £13,937), New Zealand (£20,397 against £33,022), Bulgaria (£19,802 against £63), and Belgium (£18,348 against £9,191).

The British Broadcasting Corporation state that during the next two months relay stations will take over the national exclusive frequency of 1,040 kilocycles (288.5 metres), replacing the international common frequencies which they have been sharing with stations abroad. The process will be a gradual one, each station changing its frequency as soon as the necessary additional plant is installed. Heterodyne interference has become so serious on the international common frequencies that the service areas of relay stations have shrunk to from half a mile to two miles radius during the hours of darkness, thus seriously discounting their value under existing conditions. Pending the introduction of the Regional Scheme, rather than withdraw the relay stations, an attempt will be made to revive their usefulness by the expedient of single-wavelength working. It is anticipated that this will considerably improve conditions of reception, particularly in thickly populated areas. Leeds will continue on its present frequency of 1,080 kilocycles (277.8 metres). The exclusive frequency of Bournemouth—920 kilocycles (326.1 metres)—will be transferred to Aberdeen, and the transmitter at Bournemouth will continue its service on the national frequency of 1,040 kilocycles (288.5 metres). The disadvantage of the changes will be some reduction of the proportion of local programme material at relay stations. During the main evening period of transmission all ten relay stations will be bound to radiate the same programme. Experience proves that after nightfall stations on the same frequency, even a considerable distance apart, radiating different programmes, seriously interfere with each other's service. In the daytime, when interference is less acute, "group" transmissions will probably be satisfactory ("group" programmes are those originating within the region concerned).

The Elimination of Fading?—Experiments are to be made by the British Broadcasting Corporation, in association with the National Broadcasting Company of America, with the object of relaying American programmes to British listeners by a new method, says *The Times*. Fading has been one of the chief obstacles to successful broadcasting across the Atlantic, but it is now hoped that a remedy for it will be found. The experiments in reception will be carried out at the receiving post of the B.B.C. at Keston, and the transmissions will be made from the short-wave stations of the General Electric Company, Schenectady.

The B.B.C. receiving station at Keston will use, according to the *Wireless World*, five separate receivers on wavelengths varying between 16 and 50 metres, to pick up five individual transmissions of the same programme from the satellite stations of WYG at Schenectady. For relay purposes the five receivers will have a common output. This method of avoiding fading and atmospherics has been advocated by Dr. Alfred N. Goldsmith, of the U.S. National Broadcasting Company, as well as by Capt. P. P. Eckersley.

Picture Broadcasting.—The B.B.C., in conjunction with the General Post Office, has concluded some preliminary technical experiments in the wireless transmission of still pictures. As a result, arrangements have been made for a short picture transmission daily from Daventry (5XX) outside regular programme hours. These transmissions will begin this month. The material of each transmission will consist of a selection from several subjects. If and when it is discovered that there is a sufficient public demand for "still" pictures radiated in this way, transmissions will be included in regular programme hours. The Fultograph system will be used for the series of transmissions beginning in October.

Provision is to be made for radio picture transmissions in the new B.B.C. building, which is to be erected near the Queen's Hall, London. The main studio, where these transmissions will be given, will accommodate an audience of 1,000.

It is understood that the new premises will be known as "Broadcasting House," and that they will take nearly three years to complete.

Television Broadcasting.—The wireless correspondent of the *Daily Telegraph* writes: Some time ago the Baird Television Development Co. applied to the Post Office for a license to broadcast a television service, and as a result I now hear that a Post Office test of the Baird system has already been made and that other tests will soon take place.

"In well informed quarters," adds the correspondent, "it is considered very probable that a limited number of *public* tests will also be made, in order that listeners (? spectators) may have an opportunity of judging for themselves."

GUERNSEY.—The Guernsey States Telephone Department, says the *Electrician*, has arranged a service by which subscribers may be informed of the first definite news of the mail boats' approximate time of arrival, a special wireless receiver having been installed at White Rock for this purpose.

IRISH FREE STATE.—According to the Irish Free State Department of Industry and Commerce, shipping statistics show that wireless sets and components valued at £27,848 were imported by the Free State during the period January to March last. Of this, Great Britain contributed goods to the value of £27,004 and Northern Ireland £536.

ITALY.—When the Genoa and Turin stations are completed towards the end of this year, Italy will possess six broadcast transmitters. The newest installation was completed in 32 days, the Ente Italiano per le Audizioni Radiofoniche, having decided upon its erection only a month prior to its inauguration on July 12 last. Situated between Merano and Bolzano in Italy's Alpine provinces (formerly Austrian), the station's aerial power is 200 watts and its wavelength 400 m. (750 kc.); the two-wire L-type antenna is suspended between two lattice steel masts 131 ft. high and 262 ft. apart. The copper-wire earth network is 2 ft. below the surface.

JAPAN.—Reuter's New York agency states that the Radio Corporation of America has announced that a direct wireless circuit has been opened between San Francisco and Tokio.

There are at present over 30,000 radio-licence holders in Japan.

It is worthy of note that the imports of radio apparatus from Great Britain only amounted to £45,383 for the current half-year as against £103,000 for the corresponding six months of 1927.

JUGO-SLAVIA.—Mr. E. Murray Harvey, O.B.E., M.C., British Commercial Secretary at Belgrade, has forwarded to the Department of Overseas Trade, a report on the economic conditions in the Serb-Croat—Slovene Kingdom, from which interesting document the following extract is perhaps appropriate to these columns:—

"Among the improvements which are being carried out is the extension of the telephone system. Automatic exchanges, the material for which was obtained from Germany on reparations account, have been installed at Novi Sad and Zagreb, and the Belgrade exchange is also to be converted to the automatic system. Telephonic communication with many large European towns is in existence, and will shortly be established with Zurich and Paris. Tenders have been received for an important system of underground telegraph cables, and the necessary equipment, relay stations, &c., to provide a number of lines for international service. The scheme is estimated to cost some 300 million dinars (over £1,000,000), and the firms tendering were asked

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to arrange for payment to be spread over at least 12 years. There has been a certain increase in the number of radio sets in use, there now being some 12,000 throughout the Kingdom, of which 8,000 are in Zagreb alone. The apparatus in use is principally of the cheaper Austrian and German makes. The broadcasting station at Zagreb will shortly be supplemented by one at Belgrade, for which a local company has recently obtained the concession; the apparatus will be supplied by Marconi's Wireless Telegraph Co., Ltd. A further station is to be erected at Ljubljana, for which the material will be obtained on reparations account. The Ministry of Posts and Telegraphs now possesses a small 10-w. experimental broadcasting station. The new Belgrade station is to be of 9 kw., and it is expected that on its completion much more general interest in radio will be taken in the capital."

With reference to the proposed large deliveries of telephone cables to the Government of Jugo-Slavia, it is stated that the Government at Belgrade has not adopted the recommendation of a committee which was appointed to consider the offers sent in and which suggested that the orders should be divided between the English Standard group and the German Siemens group. The Government has invited representatives of the two competitive groups to enter into further negotiations, mainly regarding the conditions of the loan which both groups have offered for the financing of the work. The value of the deliveries is stated to amount to between six and seven million dollars, an amount which *The Electrical Review* with some reason is inclined to question, probably because the figures given are neither quoted in the currency of the two chief competitors or in *dinar* of the country chiefly concerned.

LIBERIA.—The Radio Corporation of America has been authorised by the Washington Government to establish a direct wireless service to Liberia.

MEXICO.—A radio transmitting station—XC 51-44 metres—has been established in Mexico City and broadcasts Mexican news at 9 a.m., and at 9 p.m. every day. The station is powerful enough to be heard all over Europe.

NORTHERN IRELAND.—The Ulster Wireless Traders' Association (which has now a membership of 90% of all appropriate traders in Northern Ireland, will this year open its fourth wireless exhibition in the Ulster Hall, Belfast, on the 4th of the present month.

PITCAIRN ISLANDS.—Pitcairn Island is probably the world's loneliest settlement, without any means of communication. Some of the enterprising islanders, as a means of breaking down their extreme isolation, began to learn the Morse code from books with the aid of Morse keys and buzzers given to them by the Marconi operators aboard the ships that called. In 1921 they obtained a simple crystal receiver and in 1926 they were given a Marconi Type-31 ship's crystal receiver. With an aerial 180 ft. long supported in the middle by a single mast 70 ft. high, they have obtained excellent results, and on one occasion they received messages over a distance of 400 miles from a ship. The success and utility of the results led the islanders to desire a means of sending messages to ships as well as receiving. In order to do this it was necessary for one of their number to qualify as a wireless operator in New Zealand, says *The Electrical Review*, the nearest point of civilisation. After passing his examination he came to London, and at the Marconi works he was presented with a ship's spark transmitter of ¼ kw. power for the benefit of the islanders. The inhabitants of Pitcairn number about 200, and among the few "outsiders" living there is an American engineer who possesses a stationary petrol engine that will probably be used to provide the power for the transmitter.

POLAND.—The Warsaw correspondent of the *Daily News* states very definitely that the Polish Ministry of Posts and Telegraphs has broken off negotiations with the International Telephone and Telegraph Corporation of New York, on the work of exchanging the Warsaw telephone wires from overground to underground and the laying of new cables.

A sum of £1,000,000 is to be spent on the work.

British firms are to be asked to quote, the American tenders being too dear.

RUSSIA.—According to a reliable technical contemporary, the Soviet Government is reported to have concluded preliminary arrangements with the Radio Corporation of America for the exchange of patents.

SOUTH AFRICA.—*World-Radio* states that the transmitter in the new Johannesburg station of the African Broadcasting Company is being rapidly completed, and should be in operation in about a month's time. The new station will employ twenty times the power of the existing Johannesburg station. The transmitter will make use of the "low-power modulation" system so successfully employed by the B.B.C. at Daventry. Apart from the many smaller valves required in the initial stages of amplification, the transmitter employs five water-cooled valves each of which has a capacity of 10 kw. The aerial system will be supported on two special lattice steel masts 160 ft. high and 300 ft. apart, similar to those which have been erected at Daventry. The earth system will consist of twelve miles of copper wire buried in the ground at a depth of eight inches, to form a herring-bone pattern. The station is about nine miles from the city, and will be connected to the studio by an overhead telephone line. The old Johannesburg equipment will probably be transferred to Bloemfontein, and will relay the Johannesburg programmes. Another relay station may be erected at Maritzburg—a mountainous district, in which reception is difficult.

SPAIN.—Reuter's Corunna agency state that it is claimed at Corunna that the trials of the "pilot cable" devised by a French engineer, M. Loth, were attended with great success when demonstrated before General Primo de Rivera, the Premier, and members of the Cabinet. The gunboat "Dato," guided by the cable, performed evolutions with remarkable precision in the canal, listening for warnings from the cable every few minutes while in the "danger zone." Pilot cables will be installed in all other important Spanish ports.

SWITZERLAND.—*Distant music!* Wedding music was supplied by Radiophone across the Atlantic when Mr. William Chase Paulton, an Army officer, was married, in Manchester, Massachusetts, to Anne, daughter of Mr. and Mrs. Carl Pullen Dennet, on the 2nd of last month.

Sitting in the Villa Garengo at Celigny, on the shores of Lake Geneva, Mr. Ernest Schelling, the well-known pianist, played Mendelssohn's Wedding March. The music passed over telephone wires to London, and thence by radio to Massachusetts, where it was amplified for the benefit of the wedding guests as soon as the procession started. Schelling was a pupil of Paderewski.

The League of Nations and Wireless.—A Reuter message from Geneva states that the Secretariat of the League has communicated to the States members of the League the supplementary report relating to the establishment of a League wireless station to be used by the Secretariat in times of crisis, which will be considered at the forthcoming meeting of the Assembly. The Federal Political Department, in a covering note, considers it indispensable that the Federal Government should possess the power in times of crisis to delegate an observer at Geneva whose duty it should be to inform the Federal Government regarding the activity of the station.

The report of the Secretary General contains an offer from the Swiss Government, the principal points of which are as follows: The wireless telegraph station to conform to the technical conditions indicated by the experts of the League, and to be constructed in the neighbourhood of Geneva by the Swiss Wireless Company. In normal times it is proposed that it should be administered by this Company, which would afford to the League of Nations all the customary facilities and necessary priorities. In times of crisis the station would be handed over to the League of Nations, which would utilise it freely and on its own responsibility. In both events the needs of private and commercial traffic would be taken into consideration. The financial arrangements would provide for an equitable division of charges and receipts as between the Swiss Administration and the League of Nations. In general the report follows the lines of the recommendations made by the Committee of Experts on Telegraphic Developments.

SWEDEN.—According to the statistical report of the Swedish Telegraph Department for 1927, which has just been published, there were, at the end of 1927, seven broadcasting stations belonging to the telegraph service, with an average yearly service of 2,043 hours per station, and 24 smaller private relay stations. The big Motala station was put into operation in the middle of 1927. The stations at Gothenburg and Malmö are to be enlarged to 10 kw. and will use their present wavelengths. The number of licences granted at the end of the year was 328,133 or 53.9 per 1,000 inhabitants, as against 242,559 and 39.9 respectively at the end of 1926. Of these Stockholm took 56,931 or 90.5 per 1,000 inhabitants (80.0 in 1926), Gothenburg 29,051 or 77.4 per 1,000 (81.6) and Malmö 16,703 or 98.7 per 1,000 (101.9).

TASMANIA.—*The Electrical Engineer of Australia and New Zealand*, states that the Tasmanian broadcasting station, 7ZL Hobart, has been acquired by the Dominion Broadcasting Co. Pty., Ltd., proprietors of 3LO and 3AR, Melbourne.

U.S.A.—Reuter's New York Agency informs us that use of the wires and other facilities of the American Telephone and Telegraph Company, which is now enjoyed by the Western Union Telegraph Company, has now been extended also to the Postal Telegraph Company by virtue of contracts, the signature of which was officially announced on Aug. 23. A great increase in competition between the two rival companies is expected as a result of the new arrangement.

[There are some 2,000,000 miles of land telegraphs in the United States. With the exception of a few hundred miles owned by the Government in Alaska and localities where there are no commercial lines, the whole system has been constructed by private enterprise and is operated by 24 companies. Of these the three named above own the greater part of the mileage.—ED., *T & T. Jnl.*]

The Postal Telegraph Company put into commercial operation on Sept. 5 in the United States a new photo-telegraphic service. One part of the service permits of the sending, between any two of eight of the largest cities of the country, of telegraph messages which will be delivered to the addresses in facsimile. The charge for such messages is one and a half times the ordinary commercial telegraph rate. Thus, a ten-word message by photogram from New York to Boston, for example, costs 54 c. (*2s. 3d.*), to Cleveland 72 c. (*3s.*), to San Francisco $1.80 (*7s. 6d.*). Another part of the service provides for the transmitting of pictures, documents, advertisements, &c., messages in, for example, Chinese or Hebrew; in fact, anything that can be photographed. The charges for sending photogram pictures, on a plate 5 in. by 7 in., from New York, are $15 (£3) to Boston or Cleveland, $20 (£4) to Atlanta or Chicago, $25 (£5) to St. Louis, and $45 (£9) to Los Angeles or San Francisco. These services, says *The Times*, have been made possible by a contract with the American Telephone and Telegraph Company, mentioned above.

Though radioed over but a very short distance, what may be fairly described as the first telegraph transmission of an actual drama in which its two actors were both seen and heard performing, took place a month ago between the studio of the General Electric Company's laboratory at Schenectady and receiver sets placed in position three miles away. The pictures were only three by three inches and were somewhat blurred, but Dr. Alexanderson is now engaged in experimenting on pictures quadruple the size.

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GENERAL ITEMS.—*Private Companies.*—The usual quarterly dividend of 5*s.* per share free of tax has been declared by the Globe Telegraph and Trust Company, Ltd.

Technical Societies.—The programme of informal meetings of the 1928-29 session of the Institution of Electrical Engineers contains the following interesting and varied subjects :—

Oct. 29.—Discussion on "Our Profession from a Manufacturer's Point of View." (Opened by the President, Lieut.-Colonel K. Edgcumbe.)

Nov. 12.—Discussion on "Engineering Requirements of a Modern Office Building." (Opened by J. Coxon.)

Nov. 26.—Discussion on "Picture Telegraphy." (Opened by Mr. E. S. Ritter.)

Dec. 10.—Discussion on "Power Factor Tariffs and Methods of Metering." (Opened by Mr. E. W. Dorey.)

Jan. 14.—Discussion on "Electric Trolley Omnibuses." (Opened by Major A. Jenkin.)

Jan. 28.—Discussion on "Mains Testing." (Opened by Mr. F. C. Raphael.)

Feb. 4.—Discussion on "Earthing and the Safety of the Public." (Opened by Mr. W. R. Rawlings.)

Feb. 18.—Discussion on "Modern High-Power Rectifiers—their Development and Use." (Opened by Mr. R. L. Morrison.)

The School of Electrical Engineering (Wireless and High Frequency Section) will open on September 24, when a series of special courses on Radio Engineering will be given by Messrs. R. S. Elven, J. A. Gracie, A. Serner, S. T. Short, H. A. Thomas, A. C. Warren, and W. West. The courses are spread over a period of five years, and cover mathematics in addition to theoretical and practical considerations of the subject.

The 1928-9 session of the Institute of Wireless Technology will commence in October and an attractive programme is being drawn up. A review of the past year's activities indicates a very satisfactory state of affairs, the Journal of the Institute, especially, having given increased satisfaction. The growth of the Institute continues. Those interested in the Institute are invited to communicate with the hon. secretary: Harrie J. King, F.C.C.S., 71, Kingsway, London, W.C.2.

For Our Advertisers.—Contracts Open.—Where not otherwise stated, quote reference number and apply Department for Overseas Trade, London, S.W. :—

Rangoon Municipality, Oct. 19.—Supply of instruments and apparatus for installation of street fire alarms on close circuit principle. Specification, &c. (10*s.* per set), from Messrs. Ogilvy, Gillanders & Co., 67, Sun Court, Cornhill, London, E.C.3.

Victorian Electricity Commission, Oct. 22.—Transformers and spares, for Yallourn power station and Richmond terminal station (specification 28/44). (Reference B.X. 4,637.)

Postmaster-General's Department, Melbourne, Oct. 23.—Insulated wire. (Reference B.X. 4,674.)

Postmaster-General's Department, Melbourne, Oct. 27.—Supply of loading coil-pots. (Schedule C.361.) (Reference B.X. 4,695.)

Egyptian Ministry of the Interior, Oct. 29.—Supply of d.c. generator, for Beni Mazar power station. (Reference B.X. 4,660.)

New Zealand Public Works Department, Oct. 30.—Protective relay system. (Reference B.X. 4,573.)

Postmaster-General's Department, Melbourne, Nov. 6.—Automatic telephone switching equipment (schedule C. 353). (Reference B.X. 4,638.)

South Africa, Nov. 9.—Department of Posts and Telegraphs.—Supply of wall-pattern telephones for Hillburn Exchange. (D.O.T.)

Postmaster-General's Department, Melbourne, Nov. 13.—Switchboard keys and parts. (Schedule C. 362.) (Reference B.X. 4,396.)

The list of departures from the C.T.O. upon arriving at "The Day" in their official life is as follows, to all of whom the best of best wishes for the coming rest-years: Mr. A. H. Bell, Superintendent, Mr. J. A. Buffin, Assistant-Superintendent, Mr. A. J. Jellie, Superintendent, Higher Grade.

To Captain A. J. Cherry, M.C., congratulations on his promotion to Superintendent, Higher Grade, also to Mr. A. Matthews, who steps into the Captain's Assistant-Superintendent shoes, and to Mr. L. N. Collingham, also from Overseer to Assistant-Superintendent rank. The latter's appointment is back-dated to August 12.

To London Telegraphists a visit to the Radio Section of the Science Museum, South Kensington, should prove an inexpensive afternoon's entertainment, with its free admission. The latest additions are: A model of the wireless transmitting station at Rugby, where a power of 1,000 kw. is controlled by a tuning fork, a mechanical representation of the operation of a valve and a model of the Bodmin Beam station.

TOLERANCE.—Tolerance is a lesson often needed quite as much in the hearts of a minority as of a majority. Tolerance means reverence for *all* the possibilities of Truth.—*John Morley's "Gladstone."*

J J T.

PROGRESS OF THE TELEPHONE SYSTEM.

THE total number of telephone stations in the Post Office system at July 31, 1928, was 1,669,094, representing an increase of 6,893 on the total at the end of the previous month.

The growth for the month of July is summarised below :—

	London.	*Provinces.*
Telephone Stations—		
Total at July 31	592,553	1,076,541
Net increase for month	2,692	4,201
Residence Rate Subscribers—		
Total	137,908	219,003
Net increase	805	1,365
Call Office Stations—		
Total	5,370	19,387
Net increase	57	139
Kiosks		
Total	1,044	4,256
Net increase	51	117
Rural Party Line Stations—		
Total	—	10,268
Net increase	—	—
Rural Railway Stations connected with Exchange System—		
Total	—	963
Net increase	—	27

The total number of inland trunk calls dealt with during May (the latest statistics available) was 9,347,597, an increase of 745,246, or 8.7%, as compared with May last year.

Outgoing international calls in May numbered 35,931, and incoming international calls 40,899, representing increases of 8,203 (29.6%) and 12,153 (42.3%) respectively over May, 1927.

Further progress was made during the month of August with the development of the local exchange system. New exchanges opened include the following :—

PROVINCES.—Wilpshire (automatic), Haywards Heath,

and among the more important exchanges extended were :—

PROVINCES—Ashford, Bingley, Higher Broughton, Lytham, Poole, Rusholme, Smethwick, Watford.

Sixty-seven new overhead trunk circuits were completed, and 75 additional circuits were provided by means of spare wires in underground cables.

PROPOSED GATHERING OF EX-NATIONAL TELEPHONE MEN.

IN response to a wish which has often been expressed that a gathering should be held of ex-members of the staff of the late National Telephone Company, it is proposed to organise a Dinner in London some time in November or December.

The gathering will, of course, not be confined to Post Office members of the ex-National Company, but will embrace any ex-members of its staff wherever situate. About 60 names have already been received by Lieut.-Col. C. B. Clay (Hurst, Sundridge Avenue, Bromley, Kent), who will be pleased to receive the names of any further members who would like to attend.

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FIRE IN THE EMBANKMENT SUBWAY, LONDON.

On the evening of Sept. 8 the placid quietude of the Victoria Embankment on a Saturday evening was disturbed by the clanging of fire bells; smoke had been observed emanating from one of the ventilating shafts of the subway which runs under the footway on the south side of the road.

Following the alarm, fire appliances were quickly on the spot, and with that intrepid courage which characterises the London firemen, entry was made into the subway regardless of the volume of smoke, when it was found that a section of cabling, comprising power, telephone and telegraph circuits, was burning furiously. Steps were immediately taken to turn off the various electric supplies,

[By courtesy of the Topical Press Agency.

The Picture Shews the Masses of Telephone Cable Destroyed by the Fire Stacked Up on the Embankment.

and the firemen with the aid of smoke helmets and chemical extinc-teurs, attacked the flames, but so fierce was the blaze that their efforts were of little avail, and resource to water was finally decided upon, one of the river floats being brought into action and many thousands of gallons of water were pumped into the subway.

By this time several large telephone cables carrying junction circuits between exchanges in the City and West End, and junctions associated with the Trunk and Toll Exchanges, also cables carrying subscribers' circuits had been completely destroyed, and the effect was being felt in the exchanges affected in the form of innumerable lamp glows and failing junctions.

The magnitude of the breakdown was quickly recognised, and the usual emergency messages were despatched. Engineering officials were soon on the scene, and the work of repair commenced.

Throughout the Saturday-Sunday night the exchange staff proceeded steadily with the testing out, and the compiling of the lists of affected lines, the final estimate of lines affected being :—

Junctions	1,400
Central subscribers' lines	920
City „ „	380

The normal testing and plugging up arrangements in the City and Central Exchanges was inadequate to deal with such a number of faulty circuits, and arrangements were made to introduce portable tone-test units in order that all faulty circuits might be plugged up, and the appropriate advice tendered to callers.

The day following the fire being Sunday, normally a very slack day at the City exchanges, enabled a careful study to be made of the situation in preparation for the heavy Monday morning traffic.

The junction situation was first considered, as in a large number of cases routes both ways to exchanges were entirely down, but by the Tuesday morning the number of junctions out of order, which had arisen to 1,500 on the previous day, had fallen to 1,300, due to replacements by the Engineers by spare pairs on alternative routes, and by the week-end conditions had been improved to 50% of the normal number of circuits working in each route.

The 1,300 odd subscribers' lines which were down had also been receiving attention and were reduced by half by Sept. 17, and all, with the exception of two isolated lines, were restored by Sept. 25.

The dislocation of direct junction routes naturally threw a considerable burden on the operating staff, particularly at the Tandem Exchange. The normal day load at Tandem on Sept. 10 would have been about 178,000 calls. In actual fact it amounted to over 245,000 calls, and as can be imagined, congestion on many routes was inevitable, but this condition was appreciably ameliorated by the introduction of special operating measures.

Subscribers were advised of the probable delay on calls proper to the interrupted routes, as conditions would not permit offers to call to be made. In the case of Central alone, however, as many as 5,200 memorandum tickets in connexion with delayed calls were prepared in one day in respect of cases where subscribers asked to be called. It is estimated that it was possible to complete 95% of their requests.

At the time of going to press some 500 to 600 junction circuits are still faulty, but the work of repair is progressing steadily, and it is hoped that all will be in order within a few days, as the new cable pairs are brought into use.

A word of praise would, perhaps, not be out of place in respect of the manner in which the emergency has been met, and the loyal way in which all grades of the staff worked to minimise the trouble caused to subscribers. Special tribute should be paid to the jointing squads of the engineering staff who, under most difficult conditions, carried on cheerfully in effecting repairs.

EXTENSION OF THE TRANS-ATLANTIC-BELGIAN TELEPHONE SERVICE.

On October 1 the Trans-Atlantic Service will be extended to include all places in Belgium

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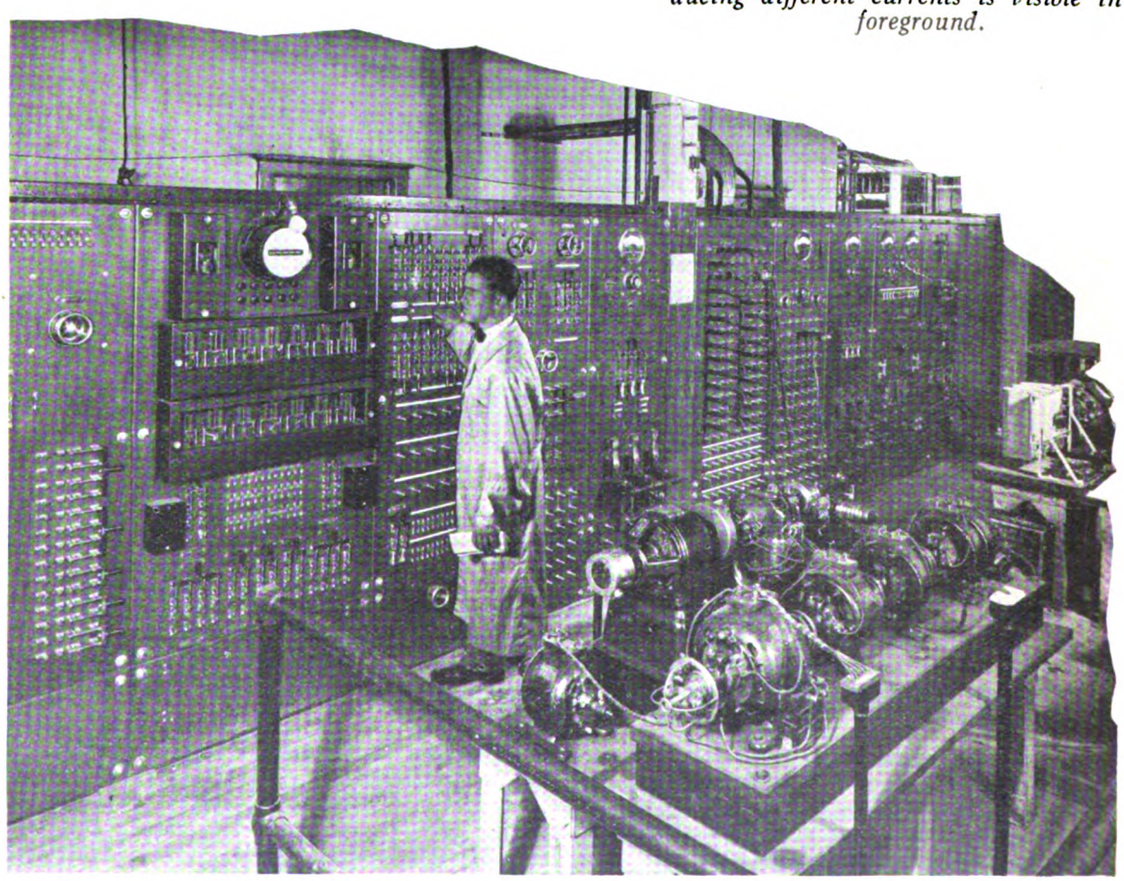
Where Strowger Auto

The Laboratory

The power board shown below has switching facilities for supplying for experimental purposes not only every kind of current that is used in an automatic telephone exchange, but also every kind that might be required for research or development purposes. Part of the generating equipment used for producing different currents is visible in the foreground.



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wer Equipment.

THE Research and Development Department of Automatic Electric Inc. has an unusually extensive and complete equipment of power apparatus of every description. Motor-generator sets, rectifiers, storage batteries, ringing machines, dynamotors, interrupter sets—every type of equipment used in actual working exchanges for the production or control of electrical current is available for study and investigation. No new method of power control, generation of ringing current, storage battery operation or anything of the sort is approved until it has been subjected to rigorous comparative tests as to its practicability under actual working conditions.

The operation of the various laboratory power units is controlled and co-ordinated by the power board pictured in the illustration. Through its use, any kind of current is made available in any of the research rooms to engineers who may require it in running tests or investigating the performance of automatic telephone equipment. The exact fidelity with which actual exchange conditions can be duplicated through the use of this equipment accounts in no small measure for the consistent record of satisfactory performance which Strowger Automatic equipment has always established when it gets "out on the job."

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The Telegraph and Telephone Journal.

PUBLISHED MONTHLY IN THE INTERESTS OF THE TELEGRAPH AND TELEPHONE SERVICE, UNDER THE PATRONAGE OF THE POSTMASTER-GENERAL.

Editing and Organising Committee - - - J. STUART JONES. W. D. SHARP. J. F. STIRLING. W. A. VALENTINE. J. W. WISSENDEN.

Managing Editor - - - W. H. GUNSTON.

NOTICES.

As the object of the JOURNAL *is the interchange of information on all subjects affecting the Telegraph and Telephone Service, the Managing Editor will be glad to consider contributions, and all communications together with photographs, diagrams, or other illustrations, should be addressed to him at the G.P.O. North, London, E.C.1. The Managing Editor will not be responsible for any manuscripts which he finds himself unable to use, but he will take the utmost care to return such manuscripts as promptly as possible. Photographs illustrating accepted articles will be returned if desired.*

VOL. XV. OCTOBER, 1928. No. 163.

TELEPHONES IN RELATION TO PROSPERITY AND INTELLIGENCE.

The *Los Angeles Herald* asks: "What effect has the use of the telephone on the prosperity and intelligence of those who employ it? That question is a natural one after reading that the United States, Canada and New Zealand, in the order named, lead all the countries of the earth in the number of telephones in use *per capita*. No one will question the intelligence or the prosperity of those three countries, either." The writer goes on to point out that whilst the countries named are at the head of the list, Russia, Brazil, Mexico, Poland, Spain, Italy and Chile come last with less than one telephone per 100 inhabitants. He wisely concludes that "the question asked at the beginning still remains to be answered according to the analysis any thoughtful person may make of the statistics." Certainly the half-drawn inference would lead to the most questionable deductions. We shall be the last to deny the cultural significance of the telephone, or its uses as an index of the prosperity of any given country. But it can only be considered as an index in a loose and qualified sense, for an index to be valid must exhibit some sort of precise relation of figure to fact. The United States has over seven times as many telephones *per capita* as France, but who would venture to deduce that America is eight times as prosperous or eight times as intelligent as France? Europe, whose development has been retarded by the war and its after effects, affords small encouragement to the deductions of the enterprising statistician. The country most highly developed telephonically is Denmark, a prosperous state not directly involved in the war. Now Denmark has three times as many telephones *per capita* as Holland, another prosperous and non-combatant country. Could anyone seriously defend the inference that Denmark was thrice as intelligent as Holland? Moreover, even in the realm of communication alone—to mention no other aids and incentives to prosperity, no other gauges of intelligence—telephony is not the sole medium. Our telegraph colleagues, judging by telegraph statistics, could abase some European countries which are now exalted, and exalt others which are lowly from the telephonic point of view. The railway man, knowing that there are more miles of rail per square mile in Belgium than anywhere else, could point out that country as the most prosperous and intelligent in the universe.

Comparative telephone statistics are of the greatest value in their legitimate sphere; only when they are correlated with other factors can they serve as an index in economic studies. We commend this view especially to thoughtful—and other—persons who undertake to analyse them.

HIC ET UBIQUE.

A CROP of legends is arising around the transatlantic service. The large figures involved in the cost of a long call seems to dazzle the paragraphists, who magnify them to fantastic sums. Recently a weekly newspaper informed us that Americans in Paris wishing to keep in touch with their business at home travelled especially to London in order to ring up New York, returning to Paris after they had made the call. The writer seems quite oblivious of the fact that service from Paris to America has been in existence since March. "The calls are taken in periods of three minutes, costing £15 a time. The most usual length for a conversation is six minutes, which, of course, comes to £30." The arithmetic is flawless, but the facts are wrong. The charge for a 3-minutes' call to New York was reduced to £9—also in March last.

Then we have the story of the financier who spoke from Berlin to New York for a period of an hour and a quarter at an alleged cost of £400. The correct charge for such a period is nearer £250 than £400. There is a better foundation, however, for the "record" London—New York call of £285 recently chronicled in the Press.

The first automatic exchange in Paris was cut over on Sept. 22 by Mons. Cheron, the newly-appointed Minister of Commerce. All the telephones in the Carnot area had previously been equipped with dials which the subscribers were warned not to use before the appointed hour on the Saturday night.

The opening of the Carnot Exchange marks the first step in the conversion of all the telephones in the French capital to dial working. The programme extending over 10 years has been mapped out for the conversion of Paris to the Rotary Automatic System. Carnot contains equipment for 6,000 subscribers' lines.

In an official report of the Chief Telegraph Engineer of the New Zealand Post and Telegraph Department on telegraph and telephone developments in Europe and America is an interesting table of comparative statistics of radio broadcasting. From this there would appear to be 5,500,000 radio sets in use in the United

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States, or 4.8 per 100 inhabitants, and 3,000,000 in the British Isles, or 6.2%. The figures are presumably only approximate, as we have not yet reached the 3-million mark in this country.

The 50,000th telephone in the city of Brussels has just been connected up. On July 31, 1914, after 30 years of existence, the system contained 18,258 instruments. At the end of 1921 the number was 19,768, 1923 26,005, 1925 36,011, 1927 45,246.

According to *The Electrical Review* an automatic telephone exchange is to be built at Tashkent, in Soviet Central Asia. The exchange will cost more than £200,000, and will be for 10,000 lines. Practically all the telephone exchanges that are now being built in the Soviet Union are automatic.

Telephone submarine cables have recently been laid between Sweden and the Island of Aland in the Gulf of Bothnia and between the Island and Finland, thus connecting Sweden with Finland.

A Sheffield Corporation tram driver brought to the offices of the *Sheffield Daily Telegraph* a large mushroom which he discovered growing in a crevice against the telephone box at Nether Green tram terminus. He stated that there were several smaller mushrooms and that probably, with the showery weather, there would be good crops there in future.

Those who believe in signs and portents may see here some prefiguration of the crop of telephone kiosks which are springing up everywhere like mushrooms.

REVIEWS.

"Post Office People." By John C. Craven. (Published by Percy Brothers, Ltd., Manchester. 128 pp. Price 1s. 6d.)

We welcome the appearance of these sketches, most of which appeared in *The Post*, in handy volume form. Mr. Craven has a lively vein of genuine humour which he exploits with considerable gusto in dealing with imaginary episodes in the daily lives of that preponderating body of our colleagues who operate telegraphs and telephones and deliver letters. He tries to solve the mystery "Why Dogs bite Postmen," and propounds theories of the origin of blushing pillar-boxes. He is at his best, we think, in satirical sketches, such as the "Marathon Postman," "Domestic Drama," "Holidays," "The Super S.C. & T," and others, but he successfully handles slight romances in the "Love Letter" and "A Telephone Romance." He expresses heretical views on the theory "there were giants in those days" in a sketch entitled "The Old Days." It will be gathered even from this brief notice that the book contains a varied and entertaining series of papers.

"International Radiotelegraphic Convention of Washington, 1927. (Published by H.M. Stationery Office. 177 pp. Price 2s. 6d. On sale at the Stationery Office, Adastral House, Kingsway, London, W.C.2.)

This book contains, in handy, cloth-bound form, the official French text of the International Convention above referred to with an English translation in parallel columns. Besides the purpose for which it is primarily intended, the book will serve French students in the service as a useful vocabulary of many technical "wireless" terms and locutions.

ROUND CORNWALL HOUSE.

THE recent removal of the London Contract Branch from St. Bride Street in the City to Cornwall House in Waterloo Road, has definitely established that building as the headquarters of the London Telephone Service. Before that removal, no sound and true Contract man looked upon Cornwall House as the real and effective headquarters of the Service. How could it be so regarded when the Contract Branch, the pivotal branch of the organisation, the branch whose work formed the start and foundation of the whole telephone edifice, was housed elsewhere? This attitude may, perhaps, appear parochial, lacking, it may be, somewhat in breadth, but, after all, there is a good deal to be said for it. The useful man in an organisation is the man who believes that his branch is the most important in the whole establishment, that, wherever that branch is, there is the centre of things. He may be a nuisance at times, but, if he is willing to fight for the idea, to insist that his branch be given its full share of consideration, it is not likely to fall below par in efficiency.

Contract men, like other men who had crossed the river, regarded the removal to Cornwall House with mixed feelings. Whatever might be said for the accommodation in the new building, there seemed a concensus of opinion that the neighbourhood of Waterloo was not all that it might be, that it was below the standard of the City, that, in the main, it might be classed as a dull and dingy neighbourhood, that its streets and buildings contained little that was attractive, that it had few interesting associations.

Closer acquaintance with the neighbourhood has sensibly modified these views. Far from containing few attractive features it was found to contain many. It was found to be a steadily improving neighbourhood, one which had changed considerably within the last score of years, one which was on the eve of further changes. A new Waterloo Station had been built. New buildings had sprung up in Stamford Street and Waterloo Road. The new County Hall had conferred a definite status on the Waterloo side of Westminster Bridge. On the other side of the river, the widening of the Strand between the end of Waterloo Bridge and Charing Cross was on its way to completion, while the section running east to the Law Courts had been spaced out to receive the great new arteries of Kingsway and Aldwych. These new features, which it might be worth while to examine in greater detail, have given character and, in some cases, architectural distinction to the locality.

It is appropriate to begin with Waterloo Station, because the new station is the dominating feature of the immediate neighbourhood, and because it constitutes one of the most noteworthy improvements which have taken place in London in the twentieth century. Those who had occasion to use the old station will remember the approach from York Road, through a dark and musty tunnel, and the confused, almost chaotic, appearance which the station invariably presented. The new structure has a spacious carriage entrance from Westminster Bridge Road and a no less spacious exit to York Road, with adequate passenger exits and entrances to and from Waterloo Road, while inside, the platforms being all in one row, there is an absence of confusion even at the height of the holiday season. The station, which is the largest in Great Britain—the Waverley Station in Edinburgh comes next—was opened in 1923. It took twenty years to build, the explanation for the length of time being that the plan of gradual construction out of revenue funds was adopted, no fresh capital being borrowed for the undertaking.

Waterloo Bridge, considered by most people to be the noblest bridge spanning the Thames, naturally comes next to the mind. Its future is, at the moment of writing, uncertain. In May, 1924, the foundation of one of its main arches weakened, and for a short time the bridge was closed. The foundations were strengthened and a new temporary bridge built, since the completion of which, in 1925, a one way traffic system has been in force, the south bound traffic using the temporary bridge. At that time it was generally agreed that a new and much wider bridge would be constructed to take the place of the old structure, but the voice of the people was raised strongly against the proposed demolition of Rennie's masterpiece and a Commission, appointed to enquire into the cross river requirements of London, recommended the retention of the present bridge, strengthened and widened from twenty-eight to thirty-five feet. If this scheme, which will cost £850,000, as against a cost of £1,000,000 for a new bridge to take six lines of traffic, is adopted, the slightly widened bridge will still constitute, it is to be feared, a bottle-neck between the large and important arteries of Kingsway, Aldwych, and Wellington Street on the north side, and Waterloo Road on the south, but this is not, perhaps, the place to discuss a question which has given, and is still giving, rise to much acrimonious discussion among architectural experts and road authorities. It is interesting to recall, before leaving the subject of Waterloo Bridge, that the bridge was built by a private company, that as a commercial speculation it was so far unsuccessful that it is on record that two shares, of the nominal value of £100 each, were sold by auction for £10 (vide *City Press* of Jan. 6, 1872), that in 1877 the Metropolitan Board of Works purchased the bridge, and that in 1878 it was opened to the public free of toll.

That part of the Strand which abuts on the north side of Waterloo Bridge, being within a very short distance from Cornwall House, comes within the scope of this article. The widening of the western portion of the Strand, between Wellington Street and Charing Cross, has been before the public eye for an exasperatingly long time, for it began as far back as 1899, when the original frontage of the Hotel Cecil was pulled down, together with some adjoining buildings, and the present eight-storey building erected, the adjacent portion of the roadway being widened at the same time to eighty feet. In

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1902, a practically identical process was applied to the Savoy Hotel, next door, the roadway in front of its new entrance also being set back in accordance with the new building line. Nothing more was done for a long time—until 1914, to be exact—when the old Tivoli Music Hall was pulled down, the present Tivoli Picture Theatre not, however, being erected until 1922. Since then a row of old buildings on the Charing Cross side of the new Tivoli has been demolished, and the new buildings set back, and a similar operation has been performed on the whole of the remaining buildings between the Savoy Hotel and Wellington Street, with the solitary exception of the building at the top of Savoy Street, at present occupied by the Agent General for Western Australia. It may, perhaps, be mentioned that while these sweeping changes were taking place on the south side of this portion of the Strand, the north side was left practically untouched, the only notable alteration, carried out without affecting the building line, being the disappearance of Exeter Hall and the erection on its site of Lyons' Strand Palace Hotel, now extending itself over the site formerly occupied by "Haxells."

The widening of the eastern portion of the Strand, between Wellington Street and the Law Courts, was carried out in the opening years of the century in conjunction with the Strand to Holborn improvement, and was, in comparison, a much more speedy affair. Space does not permit of more than a passing reference to this improvement, perhaps the most extensive carried out in London in recent years. The result, so far as the eastern section of the Strand was concerned, was a much wider thoroughfare—the average width of the section between Wellington Street and the Law Courts is one hundred feet—and the erection of a number of striking buildings on the north side. These buildings comprise the new Gaiety Theatre, a handsome building occupying the Aldwych-Strand corner on the west, Marconi House, Bush House and Australia House, which occupies the Aldwych-Strand corner on the east. The building of Bush House, one of the most striking office blocks in London, with its upper storeys "zoned" or set back in the American style, begun in 1920, extended over a period of four years. The building presents a restrained and dignified elevation on the Strand side to the exquisite little island church of St. Mary-le-Strand, while on the Aldwych side the gigantic recess of the great pillar-fronted pavilion effectively closes the long straight vista down Kingsway. Two new wings to Bush House are proposed, one of which, that on the west side of the central building, is, at the moment of writing, on the point of completion. The site between this wing and Marconi House has been acquired by the Indian Government for the erection of a building to be known as India House.

Stamford Street, built at the beginning of last century on a portion of Lambeth Marsh, runs between Waterloo Road and Blackfriars Road. The Blackfriars Road end has considerably improved in recent years, some attractive shops and a new headquarters building for Sainsburys, perhaps the best of the Stamford Street buildings architecturally, having taken the place of some old and rather dilapidated houses which formerly stood here. In one or other of these old houses lived and died John Rennie, the famous engineer, son of an East Lothian farmer, and the builder of Waterloo Bridge. Confronted with the question of Rennie's house when collecting material for this article, I made some enquiries at County Hall and received from Mr. Montagu Cox a very courteous letter with two admirable and instructive L.C.C. booklets containing particulars of Rennie's house and also of the house at 28, Bennett Street, a short street running off this end of Stamford Street, where John Leech, the famous *Punch* artist, was born. Mr. Montagu Cox mentioned—and Messrs. Sainsbury were good enough to write to the same effect—that both houses were demolished to make room for the new Sainsbury buildings. Further along Stamford Street, on the river side, are the large new premises of the Union Cold Storage Company. This building is devoid of architectural ornament, and its many windows are arranged in somewhat monotonous repetitive formation, while it is a question whether the beauty of the landscape is assisted by the huge enamelled iron signs, some of which are plainly visible, as, of course, they are meant to be, from the other side of the river. Let me add, however, that an interesting skyline is formed by the tower-like double attics, clearly introduced to break the monotony of the design. Nearly opposite is the Stamford Street Unitarian Chapel, a building remarkable—having regard to the size and character of the main structure—for its entrance feature of six massive Doric columns. Further east, opposite Cornwall House, is W. H. Smith & Sons' printing establishment, a rectangular building with an extensive glazed frontage to Stamford Street. Flanking Cornwall House are the new premises erected by Boots for the library and photographic materials branch of their business, and a few yards south of Cornwall House, in Waterloo Road, is St. John's Church, an edifice with an imposing Doric portico, the effect of which, however, is marred by the unimpressive steeple, an unnecessary architectural feature probably not to be found in the original design.

York Road, which runs between Waterloo Road and Westminster Bridge Road, does not call for much comment. The Waterloo end has been improved by the new carriage exit from Waterloo Station. At its other end, or, to be precise, at the corner formed by the junction of Westminster Bridge Road and Belvedere Road, a short road running parallel with York Road, stands the London County Hall, the new home of the London County Council. Designed in what has been termed the classic style domesticated, the County Hall building forms a strong contrast to the aspiring Gothic of the Houses of Parliament on the opposite side of the river. Its tiled roof, dormers, and high stone chimneys certainly give it an air of tranquil domesticity, and whether or not a building with domes and towers would have harmonised better with other buildings within view is, after all, a matter of individual opinion. The foundation stone was laid in 1912 and the building opened by the King in 1922.

York Road will, of course, disappear with the intended transference of Charing Cross station to the Surrey side of the river, the removal of the existing railway bridge, and the construction of a new road bridge across the river. The original suggestion for the new station was that it should be built on the site of Waterloo Junction, the small station through which south-eastern trains run between the present Charing Cross station and London Bridge. This proposal, which would have involved a long road route from the north side of the Thames, has since been abandoned and the new station will occupy the site where the Lion Brewery and the old shot tower now stand. The proposal includes the building of an embankment, similar to Victoria embankment on the other side, between the County Hall and Waterloo Bridge. The new roadway will clear up the present rather melancholy stretch of river front between these points and afford an attractive foreground for a railway terminus and hotel. It will also clear away the dingy and depressing property on the west side of Waterloo Road between the bridge and Waterloo Station, as one side of the new station will run along the whole length of that road from a point near the bridge to a point nearly opposite St. John's Church.

When will these great schemes be carried out? A writer in one of the architectural journals, after detailing the work step by step, estimated, rather pessimistically, I think, that it would take 20 years to effect their completion. More hopeful calculations range from nine to twelve years. The reconditioning of Waterloo Bridge and its widening to take four lines of traffic will first be taken in hand. Almost simultaneously will come the clearance of the triangular area between the County Hall, Waterloo Road, and the present Waterloo Station. Directly this area, which may be termed the Lion Brewery area, has been cleared, the building of the new station will proceed, followed by the clearance of the Middlesex side to make room for the approaches to the new bridge, one arm of which will lead to the Strand, and the other, which will itself form a bridge over the Strand, to a point further north, near the Cavell Monument. Finally will come the erection of the new Charing Cross Bridge.

Enough has, perhaps, been written to show that, not only is the Waterloo neighbourhood one which contains many features of interest but, what is, perhaps, of more concern to telephone men, it is one big with possibilities. It seems inevitable that the City will extend in its direction. It is possible that it may become the greatest commercial centre in London. The present business centre—the City—has many disadvantages. As regards position it is too far removed, for one thing, from Westminster, the civic centre. It is terribly congested. Its traffic has become so excessive that it blocks itself, and the economic advantages resulting from concentration in a small area have, to a large extent, disappeared. It is constantly seeking to expand by creeping north and west. Waterloo, on the other hand, is close to Westminster. It is comparatively free from congestion. It has abundant possibilities for expansion. It may, therefore, fairly be predicted, without excessive exercise of imagination, that, when Waterloo Bridge has been reconstructed and widened, when a new bridge for road traffic has been thrown across the river at Charing Cross, when Charing Cross station has been moved to Waterloo, when an embankment comparable with that on the Middlesex side has been built on the Surrey side of the Thames, the neighbourhood will become a great business centre, perhaps the greatest business centre in London.

C. W. M.

BERMONDSEY AUTOMATIC EXCHANGE.

THE opening of a new automatic exchange at Bermondsey marks a further important step in the conversion of the London Telephone Area consisting of over 100 exchanges to automatic working. The Exchange has an initial capacity of 2,600 lines, and will considerably relieve the heavily loaded manually operated exchanges serving the district. The equipment has been supplied and installed by Standard Telephones & Cables Ltd., in accordance with specifications prepared by the General Post Office. It is typical of the Step-by-Step Register Translator System adopted by the G.P.O. for London, and is similar to that which was put into operation recently at Sloane Exchange.

A subscriber at Bermondsey can now obtain any subscriber on any exchange within ten miles of Oxford Circus without speaking to an operator. To do this the subscriber simply dials the first three letters of the exchange name followed by the number of the wanted subscriber on that exchange.

A call from Bermondsey to another Automatic Exchange in the London area, such as Sloane, is now put through without the assistance of any operator, even though there is no direct line between Sloane and Bermondsey and the call has consequently to pass through an intermediate exchange.

The chief agent in this process, the Register Translator, translates the first three letters of the exchange name (SLO) into

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the code necessary for sending the call through the various stages to the wanted exchange. It then registers the four digits of the subscriber's number so that when it has directed the call as far as the wanted exchange, it can guide it further to the particular line required.

Having seen the call to its destination it frees itself from the line and is ready to pilot another call through. If the wanted subscriber is at Bermondsey, the process is just the same and just as quick, but it takes place entirely in the one building.

In a call from Bermondsey to a manually operated exchange, the process appears just the same to the calling subscriber, but in this case the Register Translator directs the call to an operator at the distant exchange. The required number appears as a group of illuminated figures on a screen in front of this operator and she completes the call without speaking on the line.

Although automatic, Bermondsey has 18 operators' positions, 5 of these are required to deal with calls incoming from manual exchanges with direct lines to Bermondsey. The operator at the manual exchange gives the order to one of these special "Cordless B" operators who, by means of a set of ten press button switches, directs the call through the automatic apparatus to the required subscriber.

Other operators are required to deal with calls from coin boxes, to give assistance to subscribers in trouble (to obtain an operator it is only necessary to dial 0), to offer trunk calls to subscribers already engaged on another call, and for other special work.

Like other automatic exchanges in London, Bermondsey Exchange is equipped with special machines called "Routiners" which periodically apply tests automatically to the important switches in the exchange and give warning to the maintenance staff if any switch is not functioning correctly.

FRANK TALBOT WADLEY.

THE Telegraph Service was the poorer on Sept. 14 last, when Mr. Wadley, the Assistant Controller, Foreign Central Telegraph Office retired upon reaching the age-limit. He was appointed as a telegraphist in February 1884, and took up the position of 3rd-Class Clerk in the Controller's Office in 1894, 2nd in 1903, 1st in 1910, Principal Clerk in 1914 and Assistant Controller in February, 1918.

Mr. Wadley had had a lengthy experience in the administration of the Anglo-foreign telegraph communications before he was appointed Assistant Controller of that important portion of the British Telegraph Service, the importance of which, indeed, had never been fully realised until the outbreak of war.

Mr. Wadley took up the reins of control of the Cable Room at the fag-end of that terrible struggle and at a time of crisis in the history of the Cable Room itself when, such were the then conditions, that only a man with goodwill at his heart and graciousness in his spirit could have succeeded.

That was over ten years ago, and there are few, surely, who have not recognised by this time how real has been his regard for the welfare of the staff, how much he has really made himself "one of us," once the necessary official restraint has been removed and the cricket field, the concert or dance room have been the meeting place. This desideratum has been aided in no small measure by the unaffected geniality of Mrs. Wadley, herself an old C.T.O. telephonist.

As a disciplinarian of the martinet type, Mr. Wadley was a failure, and for this *Deo gratias*. He had other and successful methods, no matter how he tried to disguise them by striking the table emphatically!

"When all men praise thee, beware!" says the proverb. If this be true then Mr. Wadley's case must be the one great exception that proves the rule. J. J. T.

A TRAFFIC OFFICER'S DREAM.

IN an article entitled "Economics: Fantastic and Otherwise," on pages 277-8 of the September *Telegraph and Telephone Journal*, the writer, when dealing with the question of adjustment of staff to traffic, refers to the dream of a Traffic Officer. It might be of interest shortly to describe the main lines along which his dreams—there were three of them—ran.

He saw in his first dream a gas meter from which led many pipes—each to an "A" position. At each position the current from the position register lamp actuated a valve that permitted exactly one cubic inch—or exactly one "something"—of gas to escape. The gas company's meter-reader saw to the rest.

Again he dreamt, and this time saw the steel balls, referred to in the article, rolling down inclined grooves at the end of each of which there was a little gate, so constructed that only one ball could get out at each opening, and lo! whenever a position register lamp lit up, then did one of the little gates open, and the ball thus released fell on to a travelling platform, like unto a miniature bicycle chain, which carried it against the spoke of a wheel which turned a counter round.

Again he dreamt, and this time, in a circus, he saw an acrobat who held a platter over his head, and on this platter there stood another acrobat who likewise held a platter over *his* head, and on this platter stood a third acrobat. Now, when the first acrobat turned round, the other two, of necessity and without volition on their own part, were also turned. Again, whilst the first was turning once completely round, the second also turned completely round upon *his* platter, and this time by his own volition, whereupon it was seen that the top man had turned twice though he himself had made no effort and each of his companions had but made the effort of one turn each.

The acrobats and the circus were dissolved and in their place was seen a spindle with independently moving wheels, yet with each coupled to his neighbour by a spring, and the last wheel was fixed. Between each pair of wheels a ratchet was, and it, when raised, allowed an angular movement of 18 degrees between the two wheels adjacent to it. The first wheel was turned by a winder until each wheel had travelled as far as its coupling spring permitted, and then could turn no further unless and until one or more of the ratchets moved—which indeed happened whenever the register lamp of a position lit up, and as each movement was made, so did an electric winder turn the first wheel to compensate for the separate amounts of turnings of the several wheels, and counted as it turned.

And then the Traffic Officer awoke, for in his ears there sounded the words: "Lo! these wheels and ratchets are not STANDARD PARTS, nor do they appear in the great Book called RATE."

And he went on his way sorrowful and dejected!

C. D. I.

DINNER TO N. CURTIS-BENNETT, ESQ., C.V.O.

IN response to a generally felt desire in the Civil Service, arrangements have been made to entertain Mr. N. Curtis-Bennett to dinner in recognition of all that he has done during recent years to promote the welfare of his fellow Civil Servants, especially in connexion with the promotion and development of the sports movement. For this purpose the following committee, which is representative of the whole of the Civil Service, has been formed: Mr. E. E. Beare, C.B.E. (Chairman), Mr. J. W. Bowen, Mr. C. Briggs, O.B.E., Mr. W. J. Brown, Mr. G. H. Craddock, Sir Herbert J. Creedy, K.C.B., K.C.V.O., Capt. G. Seymour Dixon, O.B.E., Miss A. E. Gardner, O.B.E., Mr. B. Jewell, O.B.E., Hon. Dame Maude A. Lawrence, D.B.E., Mr. Lachlan Maclean, O.B.E., Mr. Geo. Middleton, J.P., Mr. A. F. Pound, Dr. G. F. Herbert Smith, D.Sc. (Honorary Secretary-Treasurer), and Miss D. Smyth. Such an all-round and representative committee is probably unparalleled in the history of the British Civil Service. Moreover, Sir Warren Fisher, G.C.B., G.C.V.O., Secretary to the Treasury, who had expressed his wish to be present at the dinner, has consented to take the Chair.

The Dinner is to take place in the Victoria Hall, Hotel Cecil, on Nov. 27, at 7.30 for 8 p.m., the price of the tickets being 8*s*. 6*d*.

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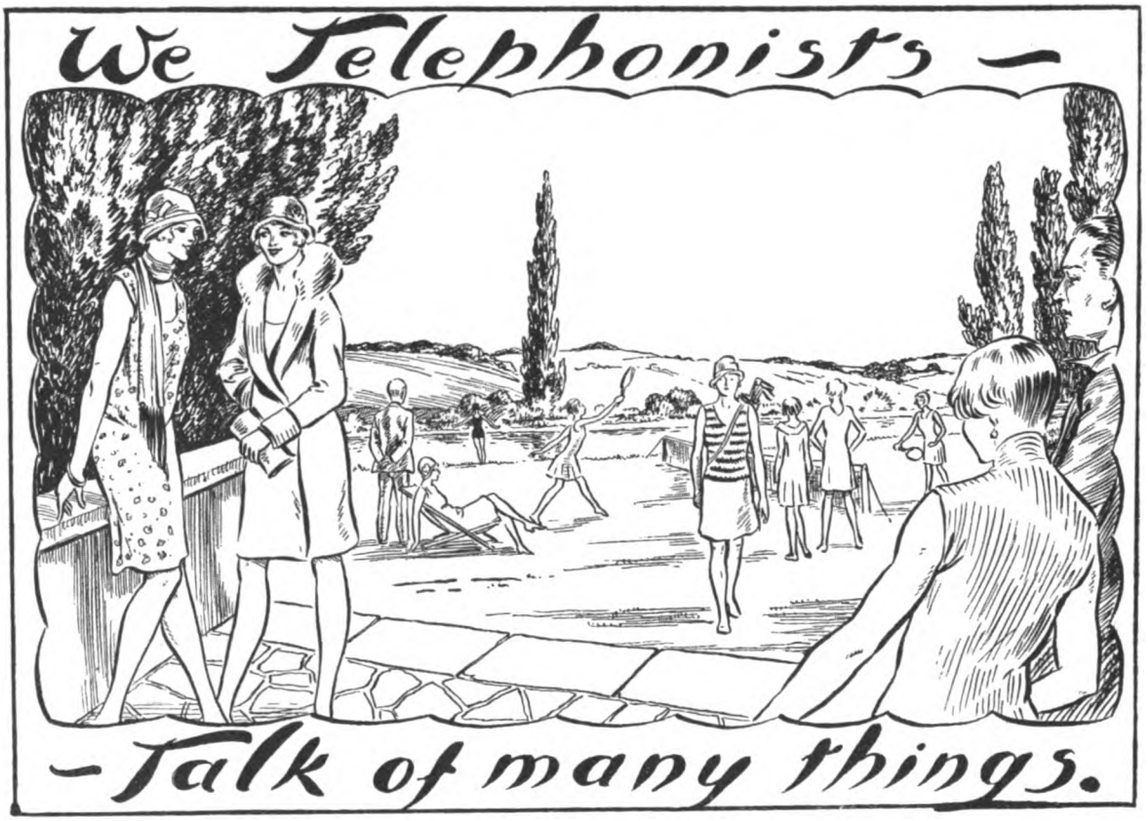

Hats.

FAR be it from me to say anything which would tend to deprive a fellow creature of the means of earning a living. I might not be so particular had I not to earn one myself. I can claim that in the matter of work I am unselfish—almost to the point of self-denial—and I should not like to feel that I am creating a condition whereby others were forced to cease work whilst I was forced to continue. Probably I bear a share of responsibility for the unemployment which exists in this present complex social system, but it is my misfortune rather than my fault. There is, of course, a great deal of unnecessary work done, and it is arguable whether it would not be better to do no work rather than to do work which is unnecessary. At best, however, it is a pitiable alternative to unemployment.

And this brings the matter of hats to a head. Hats, maybe, are useful to conceal a yawn—as you will doubtless have discovered by now—or for taking up collections or for fanning hot tea (so I have heard), but of what manner of use are they otherwise? The saying "As mad as a hatter" is well known, and its truth is demonstrable. If hatters were not mad they would not make hats nor would they ever designate as hats those things which they do make. The very fact that their madness was recognised originally, and has been accepted for all time, indicates the general attitude of mind towards hatters and their works.

It is probable that the first man to wear a hat did so with the idea of demonstrating that he was superior to his fellows. They, on their part, at once supposed that he was possessed of a devil and venerated him accordingly. Gradually each man came to regard himself as rather better than his neighbour and everyone took to wearing a hat. Then in the course of time, and with the customary mutation of ideas which marks progress, it was the man without a hat who came to be regarded as possessed of a devil. But co-incidentally, devils had ceased to command the same degree of respect. Thus, although in normal course the man without a hat should have come to be regarded as a superior being, the decline in the respect for devils robbed him of his due of veneration, and nowadays he is merely tolerated.

Now this is all quite wrong and very sad. It is not as though one could find anything to say in favour of wearing hats. Actually there is no sense in piling an erection of felt or straw or other material on the head when nature has provided a suitable covering which can be dyed or waved if necessary to meet current fashion. Most of us decline to wear a hat whilst on holiday. So used do we become to a hatless state that, during the first few days after our return to civilisation and hats, we invariably leave our headgear on the luggage rack of the morning train or on a teashop peg.

The time is past when to be hatless is to be witless, and therefore, I say, with all respect to and sympathy for the hatters, let us abolish hats. Then and only thus shall the hatters be set free from the awful stigma which has saddened their lives. They ought to be pleased, the barbers will rejoice and the housing problem for birds will be solved. Strictly *entre nous*, *sotto voce* and *sub rosa*—mustn't it be awful to be as mad as a hatter!

PERCY FLAGE.

DEAR EDITRESS,

It is with deep regret we note that we have not yet received any "Further Statistics" as promised to us by our "Central" colleague "D.D." We are of unanimous opinion that she fully deserves to be allowed to add the initials "I.D." to her name, as the information imparted by her in the previous "Further Statistics" was well worth assimilating, and has, undoubtedly, served to remove any "Creeping Depression" lurking in the region of our minds.

Why this sudden and lengthy silence? Has our friend received a shock by coming "face to face" with a few dials whilst making her investigations? Perchance she has again gone "Mountain" climbing in the "Boots" which caused annoyance to Dean Inge. We trust she will have rubber soles put on them the next time she ventures near the dome of St. Paul's. Can it be that she has retired, upon the discovery of her "Last Gem?" But listen! rumour has it that she was recently seen in the warm and misty clime of the C.C.I. Riviera. Has she gone there to trace the truant "No displays" who always take their leave "Out of course," defying alike the vigilance of engineers and supervisors.

Further "leaves" and "Statistics" from "D.D." are eagerly awaited.

L. M. C. (City Exchange).

Over the Dining Table.

A dining-room table is a peculiar subject to write about, yet methinks there is one worthy of such mention in these pages.

This particular table is not remarkable by its construction, or its position in the Hop Exchange Refreshment Club, but by the senior telephonist members who meet around it each day during the luncheon period, and the discussions that take place there.

Obscure table, in an obscure dining-room, in an obscure corner of this great City of London, you play your part in the scheme of things as well as any high-born official, for in what other place could one meet so successfully to join in the mood of one's colleagues. And such moods, and such arguments—sport, literature, the topics of the day, the latest play and numerous other subjects are debated upon. To-day an affair of State was discussed with such detail and frankness that would shame any debate in the House of Parliament. Yesterday there was a funny story told, the table was in hilarious mood. To-morrow someone may be in trouble, there will be a call for sympathy and it will not be in vain, or perhaps some scandal to which even the most well-meaning ever lend an ear. Sometimes individuals are discussed, and if such discussions were broadcast, many there are who would for ever after walk in high places, others would shrink through the meanest cracks, for have I not previously inferred that subjects are met with frankness.

There are those who prefer the oak gate-legged table in their own comfortably furnished homes to the ordinary common deal table of the work-a-day world, but even "as the venomous toad, there is yet a bright jewel in its head."

F. D. BREENS.

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Competition Results.

The winning sketch in connexion with the "heading" competition is that submitted by Mr. T. R. Fletcher, General Staff Section, Cornwall House. The prize of half-a-guinea has therefore been forwarded to him. The new design appears at the head of these notes.

Of the other sketches submitted, the three best were sent in by the following, and as a consolation prize, the *Journal* will be sent free to each of these competitors for a year.

They are congratulated on the excellence of their work :—

Miss D. M. Dibben (Park).

Mr. V. Bowles,
Buildings Section,
St. Bride Street.

Mr. M. H. Rees,
Post Office Engineering Department,
Plymouth.

Contributions to this column should be addressed THE EDITRESS, "Talk of Many Things," *Telegraph and Telephone Journal*, Secretary's Office, G.P.O. (North), London, E.C.1.

CORRESPONDENCE.

TO THE EDITOR OF "THE TELEGRAPH AND TELEPHONE JOURNAL."

Sir,—This summer I was fortunate in being able to visit the United States, and whilst in New York to see something of the working of the American telephone service. I thought the following impressions might be of some interest to your readers.

New York certainly does impress the stranger by the vast size of its buildings, and perhaps there was some excuse for that American guide whom I overheard telling a party of simple British visitors that "This is the biggest, and that is the largest, and there is the richest, &c., in the world."

The buildings of the New York Telephone Co., by their gigantic size and appearance, and thoroughly up-to-date appointments, can claim to be a true part of that big and enterprising city.

I will not attempt to give more than a passing impression of my visit to the American and New York Telephone and Telegraph Companies. One of the first impressions I received was that the Americans appear to take their business very seriously; they regard the Telephone Company as a great public service—indeed, the phrase "Public Service" was frequently on their lips. We on this side of the Atlantic are rather more reticent in the way we use the term; they, most probably, have been influenced by the virile teaching of their own philosopher Emerson, and consequently clearly recognise their very valuable part and worth in the world of business. It would be interesting to ascertain what sort of Press they have. The difference between us and them appears to be this, that while the Americans regard their Telephone Company as a great public service, the company seeing to this, we in this country are too prone to accept the often misinformed, and ill-timed criticism of a certain section of the Press. On the principle that if you will only tell a man a sufficient number of times that he is thoroughly inefficient he may come to believe you, so a constant, carping, misinformed criticism may tend to affect the psychology of a great public service.

Their striking literature, "Pamphlets of Explanation," "History of the Telephone," "Work Done," "Developments," &c., persuade the public that the telephone is a vital necessity, as a consequence the company are entitled to the esteem they arouse, by the judicious advertising of an efficient system.

I would add a further word as to their knowledge of the psychology of advertisement by environment. To realise this one must pay a visit to their head office in West Street. The entrance hall with its striking decorations, colours, lights, and remarkable series of paintings, all suggest the importance of the telephonic method of communication. Nor must one forget the splendid hall in which contracts are arranged, if in one way only we might with advantage follow their example and arrange separate tables, fitted with every requirement, at which both representative and inquirer could sit and discuss apparatus, rates, agreements, &c. The question of rates cannot be gone into here, but to take one aspect of the question, I think the subscribers in this country should know that there is an installation charge made for the telephone in America. In England it is installed free of charge; certainly English subscribers do not always appreciate this.

In closing, I must express my appreciation of the kindness and courtesy shown me by the gentlemen who conducted me through the exchanges and the various offices; also to mention the keen pleasure I experienced when my first call was made across the Atlantic, and I conversed with a friend on the London Wall Exchange—the call was due to their courtesy, another piece of evidence that one was not among officials, but friends.

In some ways they may have something to teach us, and while it would be invidious to suggest which service reaches the higher level, one might enquire whether we on this side are doing all we could to recommend to the public the good qualities and sound organisation of the Telephone Service in London.—Yours faithfully,

City Contract Office, J. W. MARSHALL.
Queen Victoria Street, E.C.4.

LONDON TELEPHONE SERVICE NOTES.

Telephonists' Society.

THE meetings will again be held in the hall of the City Y.M.C.A., in Aldersgate Street, and the session will commence on Friday, Oct. 5, when this year's President, Mr. Horace Dine, will give his address on "Something to look forward to." A very apt title if taken also in connexion with the programme for the session. An innovation this year is the experiment of serving tea to the early arrivals as an encouragement to friendly chats before the business commences.

The annual whist drive will be held at Caxton House Restaurant on Friday, Oct 25, and here again the early arrivals will find themselves catered for in the form of a photograph-judging competition. Several well-known Service people have promised to furnish photographs of themselves when not older than six years of age and the prize will be won by the competitor who names the greatest number. Other snappy competitions will be decided during the evening.

An interesting debate will take place on Friday, Nov. 2, when Miss Naomi Budden (Mrs. Herbert), lately a telephonist, will affirm that "The work of a telephonist fits her to assume domestic responsibility." The opposite view will be expressed by Mr. R. C. Atkins, better known to the readers of the *Journal* as "Percy Flage."

On Friday, Nov. 23, the Society is to be entertained by Mr. F. G. C. Baldwin, who will lecture on "The Early Development of Telephone Switching," illustrated with lantern slides.

The annual dance will be held as usual at the Bishopsgate Institute on Saturday, Jan. 26, and on Friday, Feb. 1, Captain G. Reid, R.A.F., will give a lantern lecture.

The Competition Night and distribution of prizes will be on Mar. 1.

The session will close with the production of a new play by Miss J. McMillan, which will be performed on two nights, April 4 and 5, at the King George's Hall.

* * * *

Imperial Service Medal.

An interesting event took place in the L.T.S. Conference Room at Cornwall House on Aug. 29, when Mr. W. A. Valentine, C.B.E., presented the Imperial Service Medal to Miss E. E. Waghorn, in the presence of a large number of her colleagues.

Miss Waghorn had retired on reaching the age of 60 years on June 7 last, having completed 42 years' service as a Sorting Assistant, 26 years of which were passed in the Money Order Department and 16 in the London Telephone Service.

Mr. Valentine said that the event was unique in the history of the L.T.S., owing, no doubt, to the comparative youth of the L.T.S. as a Government Department. He paid a warm tribute to Miss Waghorn's long and devoted service and said that the office was identified with her in the honour she had received. He asked her to accept the congratulations of her colleagues with their best wishes for her future.

Miss Waghorn, in reply, said that the presentation came as a great surprise to her and that she would regard the medal as one of her cherished possessions. It would remind her of the many pleasant years she had spent in the Controller's Office.

One of Miss Waghorn's Supervisors added a spontaneous tribute to Miss Waghorn's unfailing cheerfulness. The section, she said, was sorry to lose such a cheerful and helpful colleague.

* * * *

Contract Branch Notes.

The results obtained by the Contract Branch during the month of August represented a net gain of 3,081 stations as compared with 2,683 stations in the corresponding month of last year.

Obituary.—The Staff learnt with regret that Mr. G. E. Bugler, a Contract Officer, Class II, of the City Contract Office, passed away on Sept. 6 at the early age of 44. He had been away from the Office since January last, and had been superannuated a few weeks before his death. He was a conscientious worker, and a highly respected member of the staff and will be sorely missed.

A cheque was forwarded to his widow as a result of a collection from his colleagues, and the Contract Branch was represented at the funeral by Mr. A. E. Culpin, of the City Contract Office.

Cricket.—The batting averages and bowling analysis of the Contracts cricket team for the successful season just closed are given below.

Cowdray just tops the batting averages, thanks to a vigorous knock of 53, but Hodgkiss is the only man to exceed 100 runs in League games, and he has proved himself to be an ideal opening batsman.

Pearkes has had to bear the brunt of the bowling and his 15 wickets, coupled with several useful scores with the bat, reflects a good season's work.

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Another improving player is Goodger, who has made rapid progress during the year and promises to be even better.

BATTING AVERAGES.

Name.	*No. of Innings.*	*Times not Out.*	*Most in an Innings.*	*Total Runs.*	*Average Runs per Innings.*
Mr. Cowdray ...	5	—	53	96	19.2
„ Hodgkiss ...	6	—	36	114	19.0
„ Dickinson ...	4	—	24	73	18.25
„ Pearkes ...	5	1	29	64	16.0
„ Oliver	6	2	20	64	16.0
„ Goodger ...	6	—	37	75	12.5
„ Griffiths ...	5	—	21	40	8.0
„ Wilson ...	4	—	13	28	7.0
„ West	5	—	11	19	3.8
„ Sharp	3	1	1	1	0.5

The following also completed 2 innings each :—

Mr. Holdstock, 52 runs ; Mr. Barnsley, 26 runs.
Mr. Evans, 19 runs ; Mr. King, 4 runs ; Mr. Staples, no runs.

BOWLING ANALYSIS.

Name.	*Overs.*	*Maidens.*	*Runs.*	*Wickets.*	*Average per Wicket.*
Mr. Dickinson ...	15.1	3	39	7	5.57
„ Pearkes ...	24.3	8	86	15	5.73
„ Holdstock ...	13.0	3	21	3	7.00
„ Oliver	6.2	1	15	2	7.5
„ Cowdray ...	16.0	2	48	5	9.6
„ Wilson	11.0	2	40	2	20.00
„ Griffiths ...	8.0	1	28	1	28.00
„ Hodgkiss ...	23.0	6	44	—	—
„ Staples... ...	4.0	—	16	—	—

* * * *

Football.

There was a very good turn out for the first practice game of the season which took place on the Chiswick ground on Tuesday, Sept. 11. A match was played between the Stripes, consisting of the probable first team forwards, and the Whites, who had most of last year's defenders. The Stripes, who were the better opportunists, won by 3 goals to 1.

Several of the new players were very impressive, and it would appear that the prospects for the coming season are very good.

The programme of league games commences on Sept. 29, and the list of matches to the end of October is as follows :—

Sept. 29. Ministry of Health, at Chiswick.
Oct. 6. Board of Education, at Chiswick.
„ 13. Land Registry, at Osterley Park.
„ 20. Taxes, at Osterley Park.
„ 27. Match to be arranged.

* * * *

Bowls.

Four members of the L.T.S. Bowling Club gained the distinction of winning the London Area Civil Service Rink Competition—they were Messrs. Cleland (skip.), Heard, Hutchison and Weaire. The team travelled west to Cardiff, in August, and lost to the West of England. Some consolation came their way, however, for Cleland and Heard played for the English Civil Service against Scotland and Wales, and Hutchison played for Scotland. All four played in representative games against county teams.

* * * *

Swimming.

At the combined Central and City Exchanges Gala, the following were the principal results :—

E.C. District Challenge Cup :
Team Race.

Clerkenwell Exchange 1
Central Exchange 2
City Exchange 3

L.T.S. Plunging Championship :

Miss Bailey (Victoria) ... ... 57 ft. 0 ins.
Miss Brain (Royal) ... ... 56 ft. 6 ins.
Miss Mason (Avenue) ... ... 54 ft. 0 ins.

Invitation Team Race :

Gerrard Exchange... 1
Trunk Exchange 2
Victoria Exchange 3

GLASGOW TELEPHONE NOTES.

THE saying that if we "take care of the pence the pounds will take care of themselves" is well exemplified in the annual amount contributed by the Telephone Staff to the National Savings Scheme.

For the year ending Aug. 31, 1928, the sum collected exceeded £3,650, and as this was subscribed in small sums it will be clear that the Glasgow Staff have developed the habit of thriftiness to a marked degree.

This opportunity is taken also to thank all those who have so willingly organised and carried out the duties involved. These call for personal effort and enthusiasm on the part of all concerned. The success of the scheme is ample testimony to the quality of the work. That this may continue is the sincere wish of everyone.

Ode to a Multi-Coin Box.

This is the Coin-Box that Hall built.

This is Button B of the Coin-Box that Hall built.

This is the Coin that wouldn't come out of the Coin-Box that Hall built.

This is the Caller, afflicted with gout,
Who cursed the Coin that wouldn't come out,
When he pressed Button B of the Coin-Box that Hall built.

This is the Policeman, strong and stout,
Who said "Now, what's all this about ?"
And arrested the Caller, afflicted with gout,
Who cursed the Coin that wouldn't come out
When he pressed Button B of the Coin-Box that Hall built.

This is the Prison, all comforts without,
Wherein a sufferer from gout
(Whose sanity they begin to doubt),
Still raves of a Coin that would not come out
Though he's pressed Button B of the Coin-Box that Hall built.

[With apologies to the author of "The House that Jerry Built."]

A. E. HIGGENS.

Extracts from Complaints.

"We can be wrung up, but cannot get into communication with the exchange." (We should be very much obliged if they would.)

"At this stage I was subjected to a lot of filthy epitaphs : " (*De mortuis nil nisi bonum*).

(From a typed letter) : "I note your remarks."

A. E. H.

The Business Man's Dream.

I dreamt that I dwelt in a land far away
Where the telephone girl o'er the world held sway.
She never "chipped" back—for that led to strife—
Was the joy and the pride of the business man's life.

* * * *

If *he* made a mistake—no matter what kind—
She'd rectify that and the right number find.
She never once said that he "didn't correct" her,
But "swallowed" it all. He longed to protect her
From official rebuke that his error might cause,
So on using the 'phone he made a slight pause
Lest he vent on this Angel his feelings so ruffled
By everyone else. Her treatment so baffled
Each stockbroker, merchant and business men all,
That to soothe their bad temper they made a 'phone call.
No matter what happened the telephone girl
Could deal with the case. Great the price of this "pearl."
The "time" was exact—never less, never more—
Business firms ordered 'phones and extensions galore.
The "Contract Department" worked hard day and night
To please every client was their great delight.

* * * *

And I also dreamt which pleased me the most—
That all the "M.P.s" never counting the cost,
Said the telephone girl wherever she went,
Was worthy an increase two hundred per cent.
On her annual wages. To save time by months,
This bill passed its reading three times all at once.

* * * *

I woke from this dream of a system perfected
And lifted my 'phone. IT WAS QUITE DISCONNECTED ! !

M. L. TULLOCH.

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After Relaxation—Work.

" Who first invented work, and bound the free
And holiday-rejoicing spirit down
To the ever haunting importunity
Of business in the green fields, and the town—
To plough, loom, anvil, spade—and (oh, most sad !)
To that dry drudgery at the desk's dead wood ?
Who, but the Being unblest, alien from good,
Sabbathless Satan ! " (*Lamb*).

" Why should the sense of duty be dull, leaden, soul-depressing and fall upon one like a weight and a burden ? " (*O. Henry*).

" Not for leisurely contemplation of thyself art thou here. Thy work alone determines thy worth." (*Fichte*).

" Why seekest thou rest, since thou art born to labour ? " (*A. Kempis*).

" Give me leave to allow myself no respite from labour." (*Tertullus*).

" All books and no business makes Jack a jack-in-the-box ; with springs and wheels in his head—all play and no work makes Jack a jack-ass, with bosh in his skull. The right prescription for him is play when he really needs it, and work whether he needs it or not ; for that dose makes Jack a cracker-jack." (*Gorgon Graham*).

" The only happiness a brave man ever troubled himself with asking much about was, happiness enough to get his work done. " I can't work ! " that was the burden of all wise complaining among men. Happiness, unhappiness, all that was the wages thou hadst in sustaining thyself hitherward : and now thy work, where is thy work ? Swift, out with it, let us see thy work ! " (*Carlyle*).

" It is part of our *delight* to measure our wages with the merit of our work, and to *admire* the close proportion." (*Dante*).

" In labour is medicine for the hearts of men." (*R. Oakeshott*).

" God has made work the sentinel of virtue." (*Napoleon*).

" J. L."

THE POST OFFICE TELEPHONE AND TELEGRAPH SOCIETY OF LONDON.

1928-29 SESSION.

THE opening meeting of the Session will be held on Monday, Oct. 15, at the Institution of Electrical Engineers, Victoria Embankment, W.C.2., at 5.30 p.m., when F. Gill, Esq., O.B.E., Past President, I.E.E. (Vice-President International Telephone and Telegraph Corporation), will give an address on " International Telephony."

In the absence of the Chairman, J. Stuart Jones, Esq., M.B.E., on official business in America, Col. T. F. Purves, O.B.E., has kindly consented to preside at this meeting.

Members may introduce visitors, and members of the Institution of Post Office Electrical Engineers, and of the London Telephonists' Society may attend the meeting.

Tea and light refreshments will be provided in a room adjoining the Lecture Hall, from 5.0 p.m. to 5.30 p.m.

Other papers and addresses during the session are as follow :—

1928. *Monday.*		
Nov. 19	" Changes at the Central Telegraph Office during the last Fifteen Years."	Mr. J. Stuart Jones, M.B.E. (Controller, C.T.O.)
Dec. 3.	" The London Automatic System."	Mr. M. C. Pink (Assistant Controller, L.T.S.).
1929.		
Jan. 21.	" Impressions of the American Telegraph Systems."	Mr. G. T. Archibald (Inspector, T. & T. Traffic, Secretary's Office).
Feb. 18.	" Commission Control of Public Utility Services."	Mr. A. J. Waldegrave (Assistant Acct.-General G.P.O.).
Mar. 18.	" Broadcasting Developments."	Captain P. P. Eckersley, M.I.E.E. (Chief Engineer, The British Broadcasting Corporation).
April 15.	" The Telegraph Service in 1950."	Mr. J. J. Tyrrell (late C.T.O.).

Applications for membership should be addressed to the Local Agent, or to the Honorary Secretary of the Society, Mr. D. H. Thomson, Secretary's Office, G.P.O., North, E.C.1.

WHY NOT ADVERTISE THE TELEPHONE?

THE writer of a letter in the May issue of this *Journal* advocates advertising the telephone service with a view to encouraging the interest of the public, by initiating them into some of the mysteries behind the scenes.

The suggestions contained in the letter appear to be worthy of serious consideration. They constitute, in short, an appeal with a psychological aspect, as nothing is calculated to interest mere humans more than to know " how it works."

If, as Sir Henry Bunbury has warned us, the time may come when the profit from the telephones threatens to turn into a deficit, it would appear that something will have to be done to create more public interest in the business. There seems to be only one way of doing this, and that is by travelling along the same road as that taken by all progressive business firms, and advertise. There should be no half measures adopted, however, but the matter should be tackled in a thorough and up-to-date manner.

The advertising idea should be carried much further than by furnishing subscribers with details of the working of the system, and if adopted at all, every means by which publicity could be given to the service should be used. Advertisements should be framed with definite objects in view, and these could be divided into three categories with the idea of :—

(1) Increasing development.

(2) Creating the interest of the public in the working of the telephone system.

(3) Encouraging the growth of the telephone habit.

As regards item (1), the Telephone Development Association is already doing good work in this direction, but more still could be done by the Department. Why not have periodical house-to-house canvassing, especially to houses which have been scheduled as " telephone houses " during the course of block surveys—or at least these houses could be circularised. It might be necessary, of course, to regulate intensive canvassing in areas where the equipment is approaching exhaustion, but this should not be a difficult matter with efficient co-operation between the local Contract, Traffic and Engineering departments. Another method of encouraging some would-be subscribers might be by permitting them to purchase their instruments, and allowing a corresponding reduction in rental. These instruments might be supplied in various shapes and with decorative designs to suit the taste of purchasers. A display of such instruments could be made at district offices and should be visible, where possible, from the street in a similar manner to displays of electrical equipment on view at the offices of local electric lighting companies. These displays would afford a certain amount of publicity and would be an advertisement in themselves, especially if accompanied by prominent and catchily-worded notices regarding the service.

Advertisements under category No. 2 would have a two-fold object, viz. that of disseminating information among existing subscribers regarding the activities of the service for which they pay, and that of gaining the interest of the general public, and so inducing more of its members to become subscribers. In other words, this type of advertisement would tend to popularise the telephone service. It might be said that technical details would bore instead of interest the public, but in these days of wireless broadcasting, almost every intelligent member of the community is more or less acquainted with a certain amount of electrical knowledge. In any case, the information supplied would need to be only of a simple technical nature, and should be carefully chosen having due regard to the object in view.

Subscribers, as a whole, are profoundly ignorant of, but are entitled to know, some of the details regarding the " make-up " of their telephone circuit. Rental would be paid far more willingly

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if a subscriber knew for what he was paying besides the upkeep of the instrument at his house or office.

Public interest in the service would lead to a better understanding between subscribers and those who administer the service. Subscribers would have a better knowledge of what happens "at the other end," or at least of some of the equipment or operations involved. This knowledge would undoubtedly reduce the number of complaints and scurrilous talk, which tends to belittle the telephone service and to bring it into disrepute instead of, as it should be, into popular favour. A new feeling would be created and this in itself would help to increase development. Another effect of increased knowledge on the part of subscribers would be that it would help them to understand better the explanations offered to them by the traffic staff in reply to genuine complaints. This, and the reduction of complaints would relieve the local traffic staffs of an appreciable amount of unremunerative and unsatisfactory work.

The Glasgow Telephone district has given a lead as to one of the methods which might be adopted in order to impart information to subscribers and others. In the same issue of the *Journal* as quoted above, a short account was given under the heading of "Glasgow District Notes" of meetings held in that district during the winter months. At these meetings, which were well attended by subscribers, call office users, and potential subscribers, as well as exchange staffs, interesting lectures on the activities of the service and demonstrations of the working of the telephone system were given. This example might well be followed in other districts, especially in districts where automatic working has been, or is about to be introduced. The information and demonstrations given at the meetings could be supplemented by appropriately worded brochures issued, as suggested by the aforementioned correspondent, in a series. These could either be distributed at the meetings, sent out with subscribers' accounts, or could be placed on the public counters of post offices, in call office boxes, or anywhere where members of the public could help themselves, such as is done with underground railway and tramway guides. Slow motion films would provide an efficient and entertaining means of depicting the action of automatic apparatus during the progress of a call, and, no doubt, these could be provided at a comparatively reasonable cost. The films and projectors for showing them would probably cost less than the demonstration sets now exhibited in areas about to be converted to automatic working. Films of this type are extensively used in America, both for educational and advertising purposes.

By far the most important, from a revenue point of view, are advertisements under category No. 3. This has been placed last, however, because it is obviously necessary to induce the public to become subscribers before attempting to persuade them to adopt the telephone habit.

The equipment of an exchange is provided on a basis to cater for the average peak traffic load. This normally occurs during about one hour each day, the particular hour varying according to the business of the area served by an exchange and the class of subscriber's line predominating, i.e. business or residential. It is obvious, therefore, that a large amount of plant, including junctions, representing a considerable amount of money, is standing idle for the majority of hours each day. This is especially the case at automatic exchanges where switches replace telephonists on a large number of the calls dealt with. At manually operated exchanges the duties of the operating staff can be arranged so that the wastage is minimised to a certain extent. It is with the idea of providing traffic in order to make remunerative use of this idle plant that this class of advertisement should be framed.

It is an established fact that the increasing proportion of the residential class of line is having a depressing effect on the average day-calling rate per subscribers line throughout the country. The majority of calls from this class of line is originated outside the peak load hours, or what are commonly known as busy hours, of most exchanges. Any inducement, therefore, for a greater use of the telephone on the part of subscribers of the residential class, would be extremely beneficial from a revenue point of view by increasing the average calling rate per line without necessitating a corresponding increase of equipment, because in most cases the additional traffic would be effected during hours when plant would otherwise be standing idle. Such traffic would obviously be highly remunerative.

There are endless means by which publicity for the telephone service could be obtained. Advertisements should be published in the popular Press; on hoardings; and on the backs of the various forms sent to subscribers, such as the "DM" series—these are plain at present, and, therefore, good space wasted. The advertisements should consist of catchy slogans, cartoons or illustrations, depicting incidents where the use of the telephone might be an advantage. Why deliver the apparatus to new exchanges in "plain vans" as though it was on the hire purchase system? Why not label such vans "Apparatus for a new public telephone exchange at ———" and let the public know of the telephone activities in its area? With a similar idea in view, new telephone buildings in course of erection could be appropriately indicated. Even the large banking firms do not consider such a type of advertisement to be undignified. Publicity notices could be exhibited on linesmans' trucks or on the jointers' tents frequently seen in the streets. The slogan "Say it by telephone," which appeared on postmarks for a time was a step in the right direction. Why not broaden the scope for this and other slogans?

There is a rooted objection in conservative minds to the adoption by the Post Office of the advertisement methods of well-known business firms; why should such objection exist, however? Such firms are well known only because of their widespread and, in many cases, pleasing advertisements. A precedent has been created already by the advertisements inducing people to buy war saving certificates. Admittedly, advertising would entail setting aside annually part of the revenue obtained from the telephone service, but would not the results justify the expense? After all, the type of advertisements referred to are the fashion of the times, and the profit which would accrue therefrom would be for the benefit of the community as a whole.

As it is, the main publicity which the telephone service gets at the moment is through more or less derogatory articles in the Press when things go slightly wrong. This has the adverse effect to that which publicity should really have.

P. J. S.

GLOUCESTER: PRESENTATION TO MR. J. PIRIE.

REPRESENTATIVES from all sections of the local staffs assembled recently in the District Manager's Office, Gloucester, to bid farewell to Mr. J. Pirie, Assistant Traffic Superintendent, on his departure to take up an appointment as Traffic Superintendent, Class II, at Preston.

The District Manager (Mr. John H. Storrie, M.B.E.), supported by Messrs. R. S. Grosvenor (Traffic Supt.), W. J. Norman (Chief Clerk), W. Brodie (Contract Manager), J. B. Ryall (Sectional Engineer) and R. W. Slack (Head Postmaster of Gloucester), on behalf of the associated staffs, presented Mr. Pirie with tangible evidence of their esteem in the shape of an oak bureau.

He expressed his gratification that Mr. Pirie's sterling qualities, which had endeared him to all in the Gloucester District, had received recognition in promotion and extended a hearty wish that he would climb high in the service.

Feeling reference was made by Mr. Grosvenor, Mr. Ryall, Mr. Slack, and other speakers, to Mr. Pirie's thoroughness and his calmness in difficulty.

Sincerity was the keynote of all the speeches, and it was evident that the gathering felt keenly the parting with one who through the years had carved a niche for himself in their hearts.

Mr. Pirie, in returning thanks, alluded to the happy years he had spent on the Gloucester Staff and his sorrow at the severance of the connexion.

Mr. Pirie was also the recipient of an expanding suitcase from the staff at Gloucester Exchange, and a bookcase from the Exchange and Engineering Staffs at Cheltenham.

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PRESENTATION TO MR. G. A. W. GREGORY, SOUTHAMPTON.

IT was a strange coincidence that the official date fixed for Mr. G. A. W. Gregory's promotion to Traffic Superintendent, Class II, Brighton, should fall on the anniversary of his transfer to the Southampton Office.

The Traffic and Contract Sections being housed in different premises to the Accounts Section for over eleven months of Mr. Gregory's period of service in Southampton, did not permit of his acquaintance with the majority of the staff, but all sections were fully represented in the District Manager's room on the morning of June 28 to join in the congratulations on his promotion, and to wish him every success in his new office.

The District Manager (Mr. O. G. Lee), in a brief speech, paid high testimony to Mr. Gregory's capabilities as a Traffic Officer, and voiced his personal regret at Mr. Gregory's departure, whilst he congratulated him on a well-deserved promotion. He asked, on behalf of the staff, Mr. Gregory's acceptance of a case of pipes and a fountain pen.

Mr. A. L. May (Traffic Superintendent, Class I) also spoke in high terms of Mr. Gregory's capabilities and personality.

Mr. Gregory suitably replied and expressed appreciation of the tangible gifts which would prove a constant reminder of a short but very pleasant period of service in Southampton.

PRESENTATION TO MR. G. D. BATEMAN.

To mark his promotion to Traffic Superintendent, Class II, Middlesborough, the presentation of a camera to Mr. G. D. Bateman, late Asst. Traffic Superintendent, took place on June 28. In making the presentation, Mr. F. J. Frost, Traffic Superintendent, Class I, spoke with sincere appreciation of Mr. Bateman's service in the Western District, and wished him every success and happiness in his new district.

Mr. Kay, Chief Clerk, and Mr. Jowett, Contract Manager, speaking on behalf of their respective departments, suitably endorsed Mr. Frost's remarks and good wishes.

PRESENTATION TO MR. J. R. CRAIG.

MR. J. R. CRAIG, Assistant Traffic Superintendent, Telephones, Canterbury, was recently the recipient of a handsome Jacobean oak writing bureau to mark the occasion of his promotion to the position of Traffic Superintendent, Class II, Scotland West. The gift was the result of the combined subscriptions of friends in the District Manager's, Sectional Engineers' and Postmasters' Offices, and in the telephone exchanges. The presentation was made on June 27 by Mr. S. W. McDougall, Traffic Superintendent, in the absence, on leave, of the District Manager. In the presence of a small gathering representative of the various staffs, Mr. McDougall voiced the high esteem in which Mr. Craig was held, both officially and socially, and expressed the keen regret felt on all hands at his departure. That regret was, however, tinged with pleasure at his promotion, and in the name of all concerned Mr. McDougall wished Mr. Craig every success, good health and happiness in his new field. Several members of the departments added their tributes of regard and good wishes, and after a graceful reply by Mr. Craig, the ceremony closed.

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A BRIEF CHRONOLOGY FOR STUDENTS OF TELEGRAPHS, TELEPHONES AND POSTS.

BY HARRY G. SELLARS.

(*Continued from page* 284.)

1865 ... ... Marshall Lefferts eliminated the foot pedals from Humaston's perforator and introduced a friction drive.

Marcus constructed a powerful thermo-electric battery.

International Telegraph Union founded in Paris, the French Government being the prime movers. Twenty countries and states were represented, but Great Britain was not included.

1866, Feb. 1 ... British registration fee on all foreign and colonial letters reduced to fourpence, except those to, or passing through, France.

Pattern Post rates altered, intermediate rates for 12 and 20-oz. being introduced.

1866, June 30 *S.S. Great Eastern* left the River Medway with new Atlantic cable aboard.

1866, July 7 ... Shore end of new Atlantic cable laid down at Valentia.

1866, July 13... Shore end and main portion of new Atlantic cable spliced, and *S.S. Great Eastern*, assisted by the vessels *Medway* and *Albany* commenced paying out.

1866, July 27... *Great Eastern*, having laid 1,852 miles of cable, reached Newfoundland.

1866, July 28... American shore end and Atlantic cable spliced.

1866, Aug. 9 ... *Great Eastern* and *Medway* put to sea in search of the cable of 1865.

1866, Aug. 12 *Great Eastern* and *Medway* met the *Terrible* and the *Albany*. The latter had already grappled the cable and attached it to a buoy, but the chain broke and the cable sank again.

1866, Aug. 13 Mr. Canning suggested the three vessels should drag simultaneously for the cable. This was done and proved successful.

1866, Sept. 2... Atlantic cable of 1865 raised and repaired by *Great Eastern*, thus providing two communications between England and America.

1866, Sept. 2... *Great Eastern* signalled through the old cable, joined a spare length and started for Newfoundland.

1866, Sept. 8... *Great Eastern* reached Heart's Content, completed the cable and established communication with Valentia. Captain, Sir James Anderson; Engineer, Mr. Canning; Electricians, Sir William Thomson and Mr. Willoughby Smith. Mr. Varley was the electrician at Valentia.

William Thomson knighted for his work in connexion with the Atlantic cable.

Du Moncel discovered that an increase of pressure between two conductors in contact causes a diminution in the electrical resistance of the circuit of which they form a part.

Two Atlantic cables looped experimentally and signals received on a Thomson mirror galvanometer, the battery used consisting of a few drops of pure sulphuric acid in a silver thimble with a piece of zinc weighing 1½ grains.

E. A. Calahan positioned the typewheel in Humaston's perforator and altered the method of punching.

S. A. Varley introduced induced needles for Single Needle Telegraph apparatus.

Wilde invented an electro-magnetic machine.

S. A. Varley constructed the first self-exciting dynamo. Dr. Werner Siemens and Sir Charles Wheatstone discovered the principle independently and simultaneously.

Bernard Meyer devised a writing telegraph system.

First Anglo-German telegraph cable laid.

Sir W. Thomson suggested the construction of a diagram showing the variations in the thermo-electric properties of lead, copper, zinc, and iron. Professor P. G. Tait constructed the diagram.

Merchants of Alexandria asked for a direct cable between that place and Malta.

Select Committee of the House of Commons recommended a route to India alternative to that via Turkey.

Dr. Lardner and Edward B. Bright published their work on "The Electric Telegraph."

1867, Aug. 25 Prof. Michael Faraday died and was interred at Highgate.

1867, Oct. 1 ... Compulsory registration of letters containing coin extended to the Colonies.

Number of registered letters reached 3,000,000.

Sir William Thomson invented the syphon recorder, based on his mirror galvanometer.

Wilde, Ernst Siemens, and Wheatstone, working independently, suggested that the coil rotating between the electro-magnets of a magneto-electric machine might induce a current which, passed through the coils of the electro-magnet, might increase its magnetism and so lead to the induction of stronger currents.

Machines were constructed on this principle and named by Siemens dynamo-electric machines.

Ladd exhibited an electro-magnetic machine at the Paris Exhibition.

Kravogl constructed an electro-magnetic machine.

(Buergin, De Meritens, Guelcher, Marianini, Niaudet, Schuckert and Wallace constructed dynamo-electric machines of various types.)

Morse referred to Bright's "Bell" Sounder as the fastest manual telegraph.

Wheatstone introduced the centre line of feed holes into his perforated tape and used morse alphabet.

Newspapers desired to establish their own telegraph organisations but the telegraph companies objected.

Frank I. Scudamore suggested that the telegraphs of the United Kingdom should be taken over by the Government.

Electric light substituted for oil lamp at Dungeness lighthouse.

Travelling Post Offices made a separate branch.

English Money Order Office established at the Paris Exhibition.

Money Orders payable through recognised London banks.

1868 ... ... Royal E. House, of Binghampton, New York, invented and patented an apparatus called the "electro-phonetic telegraph."

J. B. Stearns, of Boston, devised the bridge system of working duplex, using condensers for compensation purposes.

1868, April 1... Bill introduced in House of Commons to enable the Postmaster-General to acquire, operate, and maintain electric telegraphs. A Committee was formed to work out the conditions of transfer.

1868, July 31... British Telegraph Act passed.

Telegraph Act gave Postmaster-General certain wayleave rights over railway systems.

Florida-Havana cable laid.

Telegraph Conference in Vienna. Arrangements made for establishing a Central Telegraph Bureau at Berne. Great Britain was not represented but adhered to the convention.

Ernst Siemens constructed a keyboard tape perforator using the morse alphabet.

Organ played at a distance by electric connexion.

Indo-European Telegraph Company formed, and route towards India constructed via Germany, Russia, and Persia.

Dr. von Stephan, of the North German Postal Confederation, suggested a Universal Postal Union. Swiss Government invited other administrations to meet at Berne to discuss the proposition.

Great Northern Telegraph Company's European system erected.

Post Office servants re-enfranchised.

Press Association established.

(*To be continued.*)

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THE

Telegraph and Telephone Journal.

VOL. XV. NOVEMBER, 1928. No. 164.

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All correspondence relating to advertisements should be addressed to MESSRS. SELLS, LTD., 168, *Fleet Street, London, E.C.*4.

TELEGRAPH AND TELEPHONE MEN AND WOMEN.

LVIII.

MR. J. T. WHITELAW.

MR. J. T. WHITELAW, the subject of our sketch, was born in 1872, at Edinburgh, and in 1892 entered the service of the late National Telephone Company as a fitter. He was subsequently made Special Faults Inspector for Police, Fire Brigade and special circuits. With the exception of a short period in Manchester on special duty, Mr. Whitelaw remained in Glasgow until 1900, when he was appointed Local Manager at Falkirk; in 1902 further promotion came his way when he entered the ranks of the District Managers at Kirkcaldy, being subsequently transferred to Hamilton in 1904. From 1901-1910 he was actively responsible for systems of main line underground work and aerial cable construction.

Mr. Whitelaw remained at Hamilton until October, 1912, when he was transferred to Lincoln, where he opened 19 new exchanges in a little over two years.

During the war period Mr. Whitelaw was responsible for the first Air Raid Warning Scheme in respect of the Humber Command, and in July, 1915, on his promotion to Aberdeen (where he remained until March, 1920), he kept in close touch with the Naval forces. He was then transferred to Middlesbrough. Promotion to the District Managership of Rochdale followed in April, 1921, to that of Blackburn in 1923, and to Manchester, the largest provincial telephone district, in February, 1926.

Mr. Whitelaw has had what is probably the most varied career of any of the present District Managers, having been in charge of eight districts at various times. As a Scotsman and, in his younger days, a player, he is a "Soccer" enthusiast, and rarely misses a match during the season. His sturdy physique suggests that even at this date he would be a capable exponent of the game. Mr. Whitelaw has always cultivated cordial relations with the staff, as evinced by his interest in and attendance at all social functions promoted by them.

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CONFERENCE OF THE TELEGRAPH UNION.

BRUSSELS, SEPTEMBER 10 TO 22, 1928.

THE normal Conference of the Telegraph Union is a rather tedious affair, in which such human interest as resides in the International Telegraph Regulations is spread out very thinly over the discussion of twelve or fifteen hundred amendments. As a relief from the monotony, a series of entertainments, known in Conference language as "distractions," is arranged. They consist, as a rule, of banquets four hours long, at which the Telegraph Service forms the main topic of conversation and of the speeches. At the end of a six weeks' Conference, the exhausted members have lost the power of distinguishing between work and distraction.

The Brussels Conference did not suffer from the usual drawbacks. It was a Conference specially convoked to deal with a single subject; and it had the great merit of being short. It is true that the traditional intervals between the distractions had to be dropped and that there were banquets on eight or nine successive days, but the end was always in sight.

Then the subject was one which had produced a sharp division of opinion in the Telegraph Union and had aroused interest out of doors. Thus we had the novel and pleasing spectacle of a Belgian girl representing the Press of the world at our meetings, and the equally novel but less pleasant sight of a deputation of commercial users of the international telegraphs.

The subject for discussion was a proposal to reduce the maximum length of a code word from ten letters to five letters. The idea behind it was that a jumble of ten letters cannot be memorised at a glance, and that telegraphists lose their way in these long groups, with the result that errors occur and free repetition is necessary. This was common ground, and so was the further postulate that if the telegraphist took the ten-letter group in two bites he would be less likely to make an error, and that he would more easily take the group in two parts, if it was already divided on the telegram form. The first objection comes here, namely the loss of line time caused by the transmission of an extra space for each code word; and a complication is introduced, because the advocates of the change did not propose that the new five-letter words should be merely the halves of the old ten-letter words, but wanted them to be free from the restriction as to pronounceability to which the old word had been subject. This restriction specified that the code word must be pronounceable according to the usage of one or more of eight western languages. Its adoption by the Conference of 1903, which first sanctioned artificial code words, showed a pathetic and groundless faith in the possession by code makers and counter clerks of a linguistic knowledge far beyond anything reached by the delegates themselves or any of their successors. The hope of the 1903 Conference was to secure artificial code words which should look like actual words. The artificial words as developed in practice looked like nothing on earth. They contained, however, a fair proportion of vowels and were better than mere jumbles of consonants, and the simple abandonment of the pronounceability rule, vague and unsatisfactory though this was, meant a definite worsening of the code word. It was nevertheless advocated by the five-letter partisans, whose logical minds were offended by a rule which could not be enforced strictly and with uniformity.

The advantage, for transmission, of two groups of five letters over one group of ten letters ceased to be obvious when the groups compared were no longer of the same kind; and the Paris Conference of 1925 decreed that statistics on this point and various others more or less connected with the subject should be collected and that a special inter-Conference Committee of 15 Administrations should examine them and report on the whole subject.

The Committee made a promising beginning by arranging to meet at the mountain resort of Cortina in the month of August, 1926, and spent the whole month there; but the rest of its work was less sound. It prepared a report advocating, by a majority of 14 to Great Britain, the adoption of five-letter code without restriction in place of ten-letter partly pronounceable code. The apparently solid majority was obtained by evading the question of the readjustment of tariffs. It was, of course, recognised that a change-over from ten-letter words to five-letter words would involve a reduction of the charge for code words, but on the actual figure of the reduction the opinions of the majority were much divided. A rate of 50% for the whole telegram would have meant a heavy loss of revenue, since no telegram consists entirely of code—the address and signature, for instance, are never code and the text often contains words and numbers in plain language mixed with code words. There was also the probability that the new rate would have to be applied, if not at the outset, then almost certainly later, to full-rate telegrams wholly in plain language.

The proportions of code and plain language vary greatly on different routes; and while the principle that the change-over should not be used to increase charges to the public was fully admitted, there was equal anxiety to ensure that it should not result in a loss to the service. A rate might be calculated which, on the traffic of the world as a whole, would give to the totality of Administrations and Companies and would extract from the conglomerated users the same sums as at present. The British code user would then pay more for his telegrams in order that the user of plain language in Poland, for example, might pay less; and the cable companies in Britain would conversely receive more while the Polish telegraph service would receive less.

The practical impossibility of finding a tariff which would not penalise large sections of the code-using public was at the root of the opposition of the British Post Office to the five-letter scheme, both at the Cortina meeting and at the Brussels Conference. The position was well understood by the commercial users both in this country and abroad, and they declared uncompromising opposition to the scheme unless the rate were fixed at half the present rate.

Nevertheless, of the 60 governments represented at the Conference, probably 40 or 45 would have voted for the five-letter scheme at some compromise rate not below 65% of the existing rate. The exact number of supporters is unknown, because the scheme did not reach the stage of a vote. The minority, comprising Great Britain, the Dominions and some of the South American countries, made it clear at the outset that it was unalterably opposed to the scheme, and it was strongly backed up by the representatives of the International Chamber of Commerce. The leaders of the majority recognised, after a week's discussion, that there was no available means of overcoming this opposition, and set themselves to find an acceptable compromise.

The compromise was reached after several days of debate, lasting sometimes from 9 a.m. to 7 p.m. and then interrupted only to prepare for a distraction. Its essential features are the retention of the ten-letter system slightly modified and the introduction of a five-letter scheme at a lower rate. The existing rates are retained for the ten-letter system. The rates adopted for the new class of telegrams are two-thirds of the present extra-European rates and three-quarters of the present European rates. The higher proportion in the European system is based on the greater risk of loss of revenue due to senders passing off plain language as five-letter code, the proportion of plain language to code in full-rate telegrams being much greater in the European system.

The five-letter words being subject to no restriction at all, except that they must not be plain language words in their ordinary sense, provide a much larger vocabulary than can be got from

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words subject to restrictions as to occurrence of vowels. Whether this larger vocabulary plus the reduced rate will make these words more attractive to the public than the ten-letter word at existing rates will perhaps appear from the experience of the next few years. It is obvious, however, that with a rate of, say, 66 for five-letter words and a rate of 100 for ten-letter words, there would be a strong inducement to senders of all telegrams except very short ones to get their five-letter words passed in groups of ten letters at the 100 rate. The vague old rule about pronounceability was not enough to prevent this ; and a mechanical rule was adopted, requiring the ten-letter word to contain at least three vowels of which at least one must be in each half. The pronounceability rule is dropped.

This requirement of three vowels is the one drawback to the scheme from the point of view of the user of existing codes. There are code words containing only two vowels which are perfectly pronounceable and therefore acceptable under the old system. They are not very numerous. A test covering 15,000 code words in actual telegrams showed only 75 which did not contain at least three vowels. Under the new rules those 75 words would be charged double, the other 14,925 words being unaffected. The users can, if it is convenient, replace these occasional words by others with more vowels ; if not, they will have to pay double rate on one word in 200. That is not a heavy burden, and there are striking advantages on the other side, apart from the retention of the ten-letter system without any increase of rates. The three-vowel rule will simplify the construction of new codes and will provide a larger vocabulary ; the abandonment of the pronounceability rule will remove a frequent source of trouble and dispute, and the reduction of the rate for telegrams in five-letter code is a definite gain for those who are astute enough to take advantage of it.

The Service does not gain so much. It gets rid of the troublesome pronounceability rule, but on the other hand there is the complication of having two rates for code telegrams instead of one rate ; and there will be some minor variations of rule, thus plain language in mixed texts will be five letters to the word in one category and ten letters to the word in the other ; figures will not be allowed in telegrams containing five-letter code except in the special case of commercial marks ; and the new category of code telegrams will be subject to a special minimum charge as for four words, where that is more than the ordinary minimum of 1*s.* 3*d.*

The new rules are to come into force on Oct. 1, 1929, and they will be reviewed at the next Conference of the Union, which is to be held at Madrid in 1932.

J. L.

OBITUARY.

MR. S. J. J. H. VAN EMBDEN.

WE regret to announce the death of Mr. S. J. J. H. Van Embden, the Inspector-General of Telephones to the Dutch Administration of Posts and Telegraphs, and the Chief Delegate of that Administration to the International Consultative Committee on Long-Distance Telephony in Europe. Mr. Van Embden was one of the Vice-Presidents of the latter organisation and had for several years directed the labour of the Rapporteurs engaged in the study of administrative and traffic questions. The Committee had no more enthusiastic supporter than Mr. Van Embden, and his devotion to his work had made him universally esteemed. He was hospitable and companionable to an unusual degree, a lover of music and literature, and a man of the world in the best sense of the term. His British colleagues are not likely to forget the many kindnesses which they received at his hands during the Rapporteurs' meetings at The Hague.

H. G. T.

TELEPHONE ENGINEERING: COST ACCOUNTING GENERALITIES.

BY H. J. B. F. AND L. J. C., LONDON ENGINEERING DISTRICT.

THE title indicates the scope of the following remarks. For the unitiated it is observed that " Cost Accounts aim at a systematic and precise record of the cost of all operations, both main and subsidiary, involved in the performance of specific work "—a part of the financial and general accounts necessary to the solvency of the telephone and telegraph business—and should provide the means of an effective Headquarter and local control over the cost of all works carried out by the Department's staff.

This latter aspect, namely, to control the cost of individual operations, is that with which the Engineering Department is primarily concerned, and being intimately related to its organisation and staffing, is a subject of the first importance, demanding a system suitable to its needs.

The present unit cost accounting system was introduced in the Post Office Engineering Department in 1920. It has operated with some success and it is beyond dispute that the cost of producing the statistics has been amply justified. It has furnished valuable information not previously available, both for the control of staff and for standard cost details for estimating proposed works. Rival systems have been sifted and trials given to certain alternatives. In the opinion of the writers there is a tendency in some systems to over-elaboration and non-essential detail and to cloud the actual requirements in a fog of figures. On the other hand, a partial system on percentage audit of the cost of specified works (even if coupled with inspection thereof) is not considered adequate to provide the necessary control or to secure the financial saving expected. So far as the workman is concerned, simplification of detail and a minimum number of operations to be costed separately is essential to correct allocations.

The existence of a unit costing system in any business has a corrective influence on all operations and bears the relationship of a police force to a community, enforcing rectitude and maintaining its well-being.

This leads to the psychological effect of any system of costing which may be beneficial or injurious, according to the policy adopted by Headquarters as to publication and utilisation of the records. The danger to be countered is subtle, viz. : the tendency for the average time recorded, per operation, to be regarded by the staff as the allowance for that unit. A judicious and limited publication of the periodical figures is the only remedy for this negation of results.

It must be recognised that no system enabling control can be really effective without the interest and co-operation of the clerical staff who analyse its details and produce the statistics, and for this some knowledge of engineering details is an essential factor, but well within the ability of the present clerical force to provide.

Much thought and attention have been devoted to the object of producing a really effective instrument for controlling costs, and a stage has now been reached where some agreement upon a system of costing for general application throughout the whole country may be shortly expected.

What, then, are the main considerations in setting up such a system ?

Briefly, we submit the following :—

(1) It should function as an auxiliary to direct supervision.

(2) It should lead to the discovery of weakness in organisation.

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(3) It should stand as a referee upon all questions of increasing or decreasing staff at any given point.

(4) It should produce sound estimating figures.

(5) The moral effect of a prompt utilisation of the figures should be an integral part of the system.

(6) Investigation of organisation, on the spot, and personal inspection of completed works by a superior officer from District Headquarters should be undertaken without delay where real weaknesses are indicated by the records.

(7) Simplicity and adaptability are of the first importance, coupled with the release of workmen from all unnecessary clerical work.

It goes without saying that the cost of producing the figures should be commensurate with the results obtained, viz., losses prevented and savings effected.

That there will always be opponents to any system from the operative and supervising ranks, who must provide the details and submit to the examination of its labours, is recognised; and exponents of rival systems will continue whatever methods be adopted, but that evolution and cultivation will be the determining factors in producing *the* system we have little doubt, for there is not much room for genius in book-keeping.

TELEGRAPHIC MEMORABILIA.

THE International Telegraph Conference held a plenary session on Sept. 20 at Brussels, and accepted a compromise whereby two systems will be authorised with regard to the wording of code telegrams: that of 10-letter words at the present rates, and that of five-letter words at reduced rates. The latter system permits all possible combinations of vowels or consonants in code words, says *The Times*. The proposal was approved by 46 of the countries represented; four countries did not vote.

It is, perhaps, necessary to recall to our readers the fact that on Sept. 14, at a meeting of this Conference, the leader of the German delegation, Herr Arendt, read a report on the labours of the Commission which had been entrusted with the work of drawing to the attention of customers the difficulties in the present system of making known their wishes, and of discovering means whereby those difficulties might be overcome. During the discussion the representative of the International Chamber of Commerce, Sir John Sandeman Allen, M.P., said that the latter body was not opposed to all changes, but could not consent to any increase in the cost of telegrams. The Congress then discussed the proposal of the Committee at Cortina for a uniform tariff at lower rates for clear and code words, the charge being 66% of the full rate in zones other than European and 90% in the European zone. The delegation of the United States of America opposed any change in the present system, and those of Great Britain and Canada objected to any increase in charges. As an undertaking was not given that charges would not be increased, the delegates from the International Chamber of Commerce withdrew from the Congress. A representative of German industry enumerated the advantages of an application of the proposals of the Cortina Committee, and said that even if the cost of telegrams was increased by one-half, it would be to the interest of German industry to support the change. A Swedish delegate then urged the merits of the system of code words with a maximum of six letters as used in the Scandinavian countries. The Conference had thus three proposals before it: First, that of the Cortina Committee, for the reduction of code words from ten to five letters, with a reduction in charges. Secondly, that of the British for no change. Thirdly, the Swedish proposal for code words of six letters. The Conference therefore decided that a Committee should examine the various proposals and report upon them.

AUSTRALIA.—Mr. Brown, Director of Postal Services, predicts the early establishment of a wireless telephony service between Australia and the United Kingdom. The London *Daily Telegraph* reports him as saying that it will be a Government controlled service, undertaken by the British and Australian Governments conjointly.

The following is an abridged report of the Annual Statement of the Pacific Cable Board for the year ended March 31, 1928:—

The financial position as therein given shows that the total receipts were £397,730, while the traffic receipts, £387,046, fell short of those of the previous year by £80,018. The report adds that this reduction of revenue was due entirely to the entry into the telegraph field of a beam wireless service between the British Isles and Australia. This service, which was opened in April, 1927, at lower rates than those of the cables, succeeded in attracting a substantial portion of the business hitherto carried by the cables. The loss was chiefly in the cheap classes of traffic which are limited to plain language and are subject to delay. The Board's expenditure during the year was £355,622, a decrease of £32,140. Sums aggregating £7,554 have been expended from the reserve and renewal fund during the year in connexion with the duplication of the cables between Vancouver Island and Fiji. As a consequence of the introduction of automatic apparatus and also the reduction of traffic, the service was found to be largely overstaffed. Accordingly, the training establishments at Bamfield and Sydney were closed down and the students then in course of training were disbanded. The surplus staff has been substantially reduced by resignations, and advantage is being taken of the remaining surplus to work off a large amount of arrears of long leave.

During the year approximately 9,200,000 words of international traffic (viz., traffic other than local messages between Australia, New Zealand and the Pacific Islands) were transmitted over the Board's system. This volume was less by approximately 2,800,000 words than that carried during the previous year. The ordinary or full rate International traffic showed a reduction of approximately 220,000 words, deferred ordinary 269,000 words, daily letter telegrams 235,000 words, week-end telegrams 2,000,000 words, Government 60,000 words, and Press 53,000 words. There was an increase of approximately 40,000 words of deferred Press traffic.

(See also under WEST INDIES.)

BELGIUM.—A meeting of the International Scientific Radio Union was held in Brussels last month to consider means of accelerating the advancement of practical applications of radio-electrical science. On the initiative of Mr. Robert Goldschmidt, the Belgian Secretary-General of the Union, who contributed 200,000 fr. (£1,140) as a first gift, says *The Times*, it has been decided to establish in Brussels a radio-telegraph experimental centre.

BOLIVIA.—The Bolivian Government has recently issued statistics of the country's foreign trade in 1926. From these the following figures relating to the imports of telegraph and telephone apparatus have been extracted, the comparative figures for 1925 being added and notes of any increases or decreases given:—

	1925. (*Values in* 1,000 *bolivianos.*)	1926.	*Inc. or dec.*
Total	94	178	+ 84
From Great Britain ...	3	61	+ 58
„ United States ...	20	41	+ 21
„ Germany	20	14	— 6
„ France	12	23	+ 11
„ Chile	31	18	— 13

(12½ bolivianos = £1.)

CANADA.—Canada, according to one of the Government Radio Inspectors, is unaffected by the U.S.A. Federal Radio Commission's new allotment of wavelengths throughout the five zones that will divide the United States equally and reduce the number of full-time broadcasting assignments from 545 to 310. The only change so far as the Dominion is concerned is that there will be one less shared wavelength, only 11, whereas formerly there were 12.

An important conference on the allocation of wavelengths will be held in Ottawa about the middle of the present month, at which will attend representatives of the Governments of the United States, Mexico, Cuba and Canada. Commander C. P. Edwards, Director of the Radio Branch of the Department of Marine, attended a conference in Washington, where various angles of the problem were dealt with. Further investigation was agreed upon, with a view to final reports being submitted at the meeting to be held in Ottawa 90 days after the Washington adjournment, says *World Radio*.

EGYPT.—More than ordinary interest has been exhibited on the part of manufacturers in the tenders for the supply and laying of the Cairo—Alexandria trunk cable, already mentioned in these columns, and the following list of the most important tenders received is supplied by Reuter's Trade Service, Cairo.

The main quotations are for heavy-loaded cable and the alternatives are generally for up-to-date *repeatered* cable similar to that used for long-distance trunk lines in Europe.

	(£E)
Siemens, Bros. & Co., Ltd.	205,300
Standard Telephones & Cables, Ltd.	217,973
Standard Telephones & Cables, Ltd., first alternative	227,672
Standard Telephones & Cables, Ltd., second alternative	159,497
British Insulated Cables, Ltd.	222,437
W. T. Henley's Telegraph Works Co., Ltd.	226,994
Callender's Cable & Construction Co., Ltd.	227,296
W. F. Dennis, agent for Felten & Guillaume ...	234,564
Pirelli	246,589
Pirelli, first alternative	187,949
Pirelli, second alternative	152,375
Siemens & Halske	251,847
Siemens & Halske, first alternative	149,126
Siemens & Halske, second alternative	133,970

FRANCE.—A new regulation has lately been issued by the French Postal and Telegraph Authorities under which subscribers to the telephone service throughout France are to be permitted to install teletype apparatus in connexion with their instruments to enable telegraph communications to be transmitted to other subscribers, or to the telephoned telegram section of the French Telegraph Department.

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"Stands Paris where it did?" may well be asked when one reads that on the authority of the French Bureau of Longitudes, hitherto "navigators and astronomers" have made an error of about six yards in the location of the French capital.

Thanks to observations—astronomical and radio combined—the exact longitude of the city is now definitely determined as two-hundredths of a second farther east than had been supposed!

GERMANY.—It is interesting to learn that a British firm, Messrs. Newton Brothers (Derby), Ltd., have just secured an order from the German State Telegraphs, Berlin, for a 50-kw., 10,000-volt direct-current generating set. It is to be motor-driven and similar in type, size and voltage to the sets designed, manufactured and installed at the British Broadcasting Station, 5GB, Daventry, and the Marconi Beam Radio Station, Dorchester.

In the last quarter there was a great diminution in the number of convictions of "pirates" in Germany, says *World Radio*, the total falling to 331, as compared with 1,003 for the corresponding period in 1927. Licence-holders are approaching the two and a half million mark, and blind licensees (who, as in England, are allowed free licences) now number 15,629.

The same authority states that the German short-wave high-power station will begin broadcasting early next year. Progress is being made with the two simultaneous transmitters at Berlin (East) and Magdeburg, and it is hoped that they will be finished by December. At the Flensburg station work has begun on the aerial masts. With the completion of these three stations, the total number of German transmitters, reduced to 24 when Dortmund closed down, will be increased to 27.

Commenting on the Berlin Wireless Exhibition held early in September a trade correspondent of the *Electrician* remarks: "The wireless trade in Germany is developing tremendously, and this year three exhibition halls were required to house the exhibits. All these were situated on the exhibition grounds at Witzleben, and could be visited without having to leave the grounds, the latter being laid out in a very attractive manner with the object of making the place a regular resort for Berliners. It is probable that the attractions of the well-ordered gardens and the miniature Eiffel tower helped to account for some of the extremely large attendances—frequently in the neighbourhood of 200,000—which have been a feature of the wireless exhibitions held there.

The exhibition was strictly confined to the display of wireless goods manufactured in Germany, no foreign-made articles being admitted. This precaution was not altogether unnecessary, as the German market is not, as is often supposed, the exclusive preserve of home manufacturers. In spite of tariffs and the strength of local competition, there is an influx of certain imported wireless material, more especially valves from Holland and Austria. In a rather unexpected direction, there is also some competition from Sweden, and the Baltic Company have now established a subsidiary company in Berlin.

"Amongst the more elaborate apparatus exhibited this year," continues the correspondent, "should be mentioned the Lorenz-Korn picture transmitting apparatus as used by the police authorities. Dr. Korn is one of the original investigators in the field of wireless picture transmission, although now not so much heard of as some of the later inventors. Telefunken apparatus for speaking films was also demonstrated, as well as the other interesting Telefunken development for the wireless transmission of film pictures. With the Karolus system, the film runs continuously through the transmitter at a speed of 10 pictures per second, and each picture is divided into 10,000 elements, though it is stated that it is quite possible for this speed to be increased. From a technical point of view this exhibit is one of the most intersting at the exhibition.

GREAT BRITAIN.—Speaking at a dinner of the Radio Manufacturers' Association held at Olympia, London, the evening prior to the opening of the highly successful National Radio Exhibition, Senatore G. Marconi said: "It is a wonderful revelation to me to see what the radio industry has achieved and is achieving. . . . Wireless has become the most potent means of communication ever known to mankind, and the fullest development of wireless is still before us. The future is full of promise, and I think it will be full of surprises. I am still of opinion that we are a long way from being able to utilise electric waves to their fullest extent." It was mentioned at the same gathering as a surprising fact that although in bulk more wireless apparatus had been manufactured in the United States, nevertheless, while in the latter country one in every five houses is supplied with radio receivers one in every three is so furnished in Great Britain.

It was notable, too, at this particular exhibition, that the ruling of the British Patent Authorities regarding the excessive royalties charged on valves, had had an immediate effect in the reduction of prices, so that "the more elaborate and efficient apparatus was now brought within reach of a wider public."

The *Evening News* reports that the British Broadcasting Corporation intends to build new premises to replace its present headquarters at Savoy Hill. To this end negotiations are in progress regarding the construction of a building on a site at the corner of Portland Place and Langham Street, Oxford Circus, London. The first twin-wave regional station that is being built at Brookmans Park will eventually replace the London transmitter (2LO), which is situated on the roof of stores in Oxford Street.

For the special information of our Colonial and foreign readers the following interesting particulars are excerpted from the official publication published by H.M. Stationery Office, London, entitled, "The First Annual Report of the British Broadcasting Corporation," and may be thus summarised:—

"A total profit of £128,336 is shown in the Revenue Account for 1927. Of this amount, £100,000 is transferred to the capital account to cover future expenditure in the construction and equipment of regional stations. These are designed to give the greatest number of listeners an uninterrupted service of two programmes.

"Licences in force at the end of 1927 numbered 2,395,174, an increase during the year of 217,000.

"No fewer than 60,000 letters were received from listeners during the year with reference to programmes.

"'Prospects are encouraging for Empire broadcasting,' states the report, 'although undue expectations for the near future are to be discouraged. As a result of experimental work carried out at Chelmsford to determine the best method of linking widely-separated broadcasting systems where land lines are impracticable, it was found that short-wave telephony stations will in all probability provide the necessary link.'

"Educational broadcast gained steadily in importance and popularity, approximately 4,000 schools listening-in to London and Daventry schools transmissions alone, this being double the number for the previous year. Music formed about two-thirds of all programmes.

"Transmissions from all stations covered over 68,000 hours in 1927, the percentage of breakdown being only .03. There was a strong and growing demand for features other than entertainment."

Much the largest part of the B.B.C.'s income comes from the Post Office, based on the number of receiving licences issued. Of all fees collected, 12½% is retained by the Post Office to cover costs of collection and administration. Then, in respect of the first million licences issued, the Treasury retains a further 10%; in respect of the second million, 20%; of the third, 30%; of anything over three millions, 40%.

The revenue account gives some interesting details of the expenditure side, programmes, &c. (including costs of artists, orchestras, news, royalties, performing rights and simultaneous broadcast telephone system, and salaries of programme staff), costing no less than £487,728; maintenance of plant, power, salaries and expenses of engineering staff, development and research, &c., £131,036. The balance, being the net revenue for the year, was £128,336. The income was £901,626, made up of licence income £800,959; net revenue from publications, £93,686; and interest and sundry receipts, £6,980."

Llandudno.—The urban district council has consented to the proposals of Broadcast Relay Service, Ltd., to open a broadcast reception relay station in the town and erect wires where necessary.

Southampton.—Twelve hundred miles out, the surgeons of the Cunard liner *Berengaria*, which recently arrived at Southampton, wirelessed to New York asking for advice on the treatment of a passenger. The reply was received within seven minutes.

The passenger was Dr. M. Shiffman, a New York surgeon who was taking a crate of 10 snakes, including two rattlesnakes and two copperheads, to Vienna for laboratory purposes. While taking out a snake which had died he was bitten on the finger by a copperhead. His arm immediately swelled, and his condition became critical.

He was attended to by the liner's surgeons, but since they were not certain whether they were applying the right treatment, the message to New York was sent. The reply showed their treatment was correct, and when Dr. Shiffman disembarked at Cherbourg he had nearly recovered.

A British fleet order has been issued to the effect that Navy telegraphists who passed professionally in the Signal School for advancement to leading telegraphist before July 16, 1926, are not required to obtain educational certificate, Part I, as a condition of advancement to leading telegraphist.

If the information, from a usually very reliable source, is correct, before these pages are in the hands of our readers—actually Oct. 30—the B.B.C. will broadcast pictures from that day onwards each day excepting Sundays and Mondays. "The pictures," says the *Daily News*, "will be supplied to the B.B.C. on specially prepared copper plates ready for transmission. *The Electrical Review* states that the "Fultograph" system will be used and that the broadcast will be made from Daventry (5XX).

The receiver, says the same periodical, may be connected to any ordinary radio set capable of operating a loudspeaker. It will work entirely automatically, consuming no more current than one ordinary valve; therefore, additional batteries will not be needed. The picture (3 by 4.5 in.) is built up gradually in three minutes, during which time the process can be watched on the cylinder of the instrument, which is revolved by spring clock works; when complete, the picture does not require fixing or developing, as a specially prepared paper is used.

The position of "still pictures" and television matters appears to be well laid down by the *Daily Telegraph*, which says that: "It is true that the Fultograph system has been tested by the B.B.C., and found sufficiently satisfactory to warrant the commencement of a series of picture broadcasts; but should the novelty prove popular, and should the service be extended, the B.B.C. will not be likely to grant a monopoly to one particular concern.

"The same applies to television. The B.B.C. is open to consider other systems, and it has one main object in view, i.e., to give listeners the best system. There will be no question of monopoly and long-term contracts, and the wireless trade in general is expecting its share of increased business, should a still picture service or a television service eventually prove satisfactory and popular."

Three days later the wireless correspondent of the *Telegraph* writes to the effect that there are apparently grave doubts concerning the suitability of the Baird system for Television broadcasting, but the B.B.C. are waiting the report of their engineers.

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Mr. Baird recently stated to a London daily journal that he was confident that in the near future the public will be able to see by radio an image of the artist who is broadcasting.

The Electrical Review says: "Television, with the human voice synchronised with the picture, has often been foreshadowed: Mr. John L. Baird has achieved a considerable measure of success, and a recent demonstration convinced us that the results he now obtains are a material improvement on his earlier ones. The art has reached a stage which is at least comparable with, if not slightly better than, that of voice and music reproduction when broadcast radio-telephone apparatus was first marketed commercially. It is by no means perfect, of course, but without doubt the transmission almost instantaneously to a distance of images of objects by telegraphy, either wire or wireless, has been accomplished."

The representative of the *Electrician* who witnessed a demonstration of the Baird system at the Radio Exhibition in London was distinctly disappointed with what he saw, and confirmatory of this opinion, though not conclusively so, comes the news that, over date Oct. 17, the British Broadcasting Corporation has issued the following statement:—

"In agreement with the Post Office, the B.B.C. required a studio demonstration of the Baird television apparatus before considering whether there should be public experiments, in which a B.B.C. station would participate. A demonstration took place at the offices of the Baird Television Development Company, Ltd., on Oct. 9, and was attended by administrative and technical officials of the Corporation.

"The opinion of the B.B.C. representatives was that, while the demonstration was interesting as an experiment, it failed to fulfil the conditions which would justify trial through a B.B.C. station.

"The board of the Corporation has decided that an experimental transmission through a B.B.C. station shall not be undertaken at present. The Corporation would be ready to review this decision if and when development justified it."

One of their directors has since stated that the decision may cause the Baird Company to erect a station abroad for the benefit of their subscribers in Great Britain and other countries.

At the autumn Trade Conference of the Music Trades Association, Mr. C. Foulds, presiding, raised the question of the position of the gramophone, which had been linked up with radio in a combined instrument and for which it was claimed that the proper channel for the sale of this combination should be the retail *music* trade. Mr. Mould, of the Radio Manufacturers Association, asked whether it was considered that *his* trade was a branch of the music industry. The president of the Music Trades Association replied by expressing the hope that it soon would be.

From what one has been able to gather up to the moment, matters seem to have ended with a standardisation of prices whichever industry was the retailer!

INDIA.—According to *The Electrical Review*, in view of the complaints of business communities in Ceylon and India that they are being subjected to serious inconvenience on account of delay and mutilation caused by what is called an obsolete system of telegraph working, the Government is carrying out experiments between Madras and Colombo to provide for simultaneous communication between Colombo and Madras and Colombo and Madura. This would double the carrying capacity of one cable and would greatly accelerate disposal of traffic for stations south of Madura which hitherto has had to travel *via* Madras.

IRISH FREE STATE.—On Oct. 1, the charge for a telegram sent from Great Britain or Northern Ireland to any place within the Irish Free State became 1*s.* 6*d.* for 12 words, or less, and 1*d.* for every word over 12.

LEEWARD ISLANDS.—A tornado early last month destroyed the telephone exchange and lines throughout the island of Montserrat. The systems at St. Christopher (St. Kitts) and Nevis also suffered, while country lines at Roseau (Dominica) were demolished.

MEXICO.—*The Electrical Review* states that the Mexican Legation has informed *World Radio* that a new transmitting station has been opened at San Lazaro, a suburb of Mexico City, to broadcast Mexican news, and it is further stated that it is sufficiently powerful to ensure reception throughout Europe. The times of transmission will be 9 a.m. daily on a wavelength of 44 metres. The call sign of the station is XC51.

NEW ZEALAND.—The Officer-in-Charge of the Wellington (N.Z.) Trade Commissioner's Office has forwarded to the Department of Overseas Trade a report upon New Zealand's import trade during 1926 and 1927. In the course of this it is stated that the imports of copper wire declined from £241,786 in 1926 to £186,095 in 1927, but the United Kingdom's share of this trade rose from 79.2 to 90.4%. The imports of electric batteries and cells rose to £152,060 in 1927. The bulk of these was supplied by the United States (£93,323); the United Kingdom's share was £36,770, and that of Canada £18,730. The United Kingdom has steadily improved her position in the imports of insulated cable and wire at the expense of the United States, and in 1927 claimed £484,781 out of a total of £520,534; the United States accounted for £7,353, Canada for £10,023, Belgium for £10,269, and Germany for £4,444. In telegraph and telephone apparatus (including wireless) there was a rise from £295,817 to £391,149. The United States led in this section with £178,271, the next being the United Kingdom (£93,918), Belgium (£72,003), the Netherlands (£12,534), Australia (£7,913), Sweden (£5,067), and Canada (£4,939).

The revenue of the New Zealand Post and Telegraph Department for the year 1927-8 was £3,329,511, made up of postal revenue £1,439,586, telegrams, £435,514, and toll and other telephone calls, £1,454,411, and the expenditure was £2,299,571, leaving a surplus of £1,029,940 available for interest and depreciation, compared with £874,392 in the preceding year. The total receipts for 1927-8 were £1,088,845 in excess of those for the previous year. At Dec. 31, 1927, the number of radio receiving licences issued in the Dominions was 38,125, and at March 31, 1928, the total approached 40,000. The automatic telephone service has been applied to rural lines in the Wellington exchange area, and the extension of the system to other rural districts is being considered. The number of subscribers' main telephone stations on March 31, 1928, was 114,079, and toll and service stations, public call offices and extension stations brought the total up to 139,740.

PORTUGUESE EAST AFRICA.—In the course of a report upon conditions in Portuguese East Africa (reproduced in the *Board of Trade Journal*), Mr. Joseph Pyke, British Consul-General at Lourenço Marques, says that a steady increase in the telephone service is taking place, there being about 700 telephones in the district of Lourenço Marques, while the land telegraph service is maintained in an efficient state. Development in this direction is, however, rather by way of extension of the wireless system. The towns of Chai Chai (Vila de Joao Belo) and Porto Amelia are being equipped with Marconi plant, and the station at Tete is on the point of being opened for communication with the Colony. A powerful beam station was opened at Lourenço Marques early last year, and the results secured would appear to have exceeded the hopes of the promoters of the enterprise; business with Europe has even been obtained in the Union of South Africa.

RUSSIA.—Plans for early radio-telegraph communication between the United States and Soviet Russia were announced by Mr. G. Gurevitch, acting chairman of the board of directors of the Amtorg Trading Corporation, New York City, in discussing an agreement recently made between the Radio Corporation of America and the Soviet State Electrotechnical Trust of Weak Current Factories, calling for technical co-operation and exchanges of patent and engineering information between the two organisations. The Amtorg Corporation has also placed a large order for radio equipment in the United States, he said. The Soviet State Weak Current Trust operates the principal factories in the Soviet Union producing telegraph, telephone and radio equipment.

Intensive development of radio communication is also expected in Russia, according to *The Electrical Review*, where 67 broadcasting stations and 250,000 receiving sets are claimed to be in use.

A Radio University has been opened at Leningrad, according to the Riga correspondent of the *Daily Telegraph*. The object of the new institution is to train specialists for Soviet radio stations and to prepare students as lecturers, &c.

SPAIN.—A conference of wireless maritime associations representing the principal wireless maritime companies of the world, was recently held at San Sebastian, Spain, and an international radio maritime committee was formed. The purpose of the committee is to pool the experience and specialised knowledge of wireless companies for the benefit of shopowners, passengers, and the public generally, and to aid all those who are interested in the development and use of wireless at sea. Mr. A. Hubert, managing director of the Belgian company, was elected president of the new committee, and Mr. F. S. Hayburn, general manager of the Marconi International Marine Communication Co., Ltd., was elected vice-president.

SWEDEN.—*The Electrical Review* states that the Government Telegraph and Telephone Department, in its preliminary budget, plan for 1929-30, calls on the Treasury for a sum of 8,618,593 kronor, of which 7,000,000 kr. is for the further extension and development of the telephone and telegraph systems. The Department plans the building of new broadcasting stations at a cost of 1,200,00 kr., and the broadcasting stations of Stockholm and Sundsvall will be rebuilt. A new submarine telephone cable will be laid to the island of Gotland in the Baltic at a cost of 1,300,000 kr., and the new telephone connexion with Finland will be opened for traffic early next year.

SWITZERLAND.—The Department of Overseas Trade is informed that the Federal Administration of Telegraphs is issuing as from Sept. 1, monthly licences for wireless receivers. The formalities for their issue have been made very simple, as the object of the new system is to enable owners of new receiving sets to test their sets thoroughly before applying for the ordinary annual licence, the cost of which was raised from 12 to 15 francs on Jan. 1, 1928.

The Third (Reduction of Armaments) Committee has had before it the question of the League wireless station, which is considered by some nations as part of the machinery of security. However, says *The Times*, Mr. Cadogan, the British delegate, not only stated that Great Britain considered the cost of a purely League station to be altogether out of proportion to its possible utility, but that it did not agree with the Swiss Government's proposal to build a Swiss station, to be at the disposal of the League in time of crisis. The British Government was not sure that wireless was the most suitable form of transmission for the League, and, in any case, it did not think the League was justified in so adding to its financial commitments. The moment was not opportune for expenditure of that character.

U.S.A.—Reuter's New York agency cables that, by filing at Washington, on Sept. 26, before the Federal Radio Commission, its application for the allocation of 67 wavelengths over which to transmit domestic wireless messages, the Radio Corporation has taken the first step in what may become a struggle between it and the older established land-wire companies, such as the Western Union and the Mackay Companies. Ever since trans-oceanic wireless was placed in operation, the Radio Corporation, through lack of other facilities, has had to depend on other domestic telegraph companies with which it is in cable competition to carry to points within the

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United States the messages it receives daily from abroad. The Radio Corporation claims, however, that this method of distribution has never been satisfactory, and it is now seeking permission to establish its own network of domestic stations (in all about 30, situated in the leading commercial centres of the country) so that it can distribute its own messages without employing others. Very likely the companies at present engaged in the domestic telegraph business will seek to oppose the Radio Corporation's application, and the development of a struggle is being watched with the keenest interest by the financial interests involved.

Quickly on the heels of the above information came news from the Washington branch of the same agency that the International Telephone and Telegraph Company, through its subsidiary, the Mackay Radio Company, has applied to the Federal Government for a number of short-wave channels, to make possible the establishment of a commercial wireless service throughout the country. Several other organisations have also applied for major allocations of short-wavelengths, chief among them being the Radio Corporation, which is seeking to supplement its international connexions.

A message from Washington to the Exchange Telegraph Company reports Mr. W. A. Winterbottom, the traffic manager of the Radio Corporation, as having said that if their petition were granted it would lower the land-wire tolls, and that the Radio Corporation has now four offices to handle 10,000 radiograms daily across the Atlantic and 2,000 over the Pacific, which had to be distributed in the interior over land lines.

Another interesting development is the following, regarding the political use of broadcasting. The *T. & T. Age* reports that permits for the construction of two radio transmitting stations of 10,000 watts each, one in New York and the other in Chicago, and licences for experimental operation on three short-wave channels have been granted to the Universal Wireless Communication Company by the Federal Radio Commission as the first step in a plan to set up a national radio communication network as a public utility. Politicians, says *The Age*, who have been declaring that to "just own or hire a radio broadcasting station and bawl them out" was all that would be necessary in the political campaigns this Fall, will be interested in the Federal Radio Commission's first decision on a matter of that kind, ordering station WCOT, of Providence, R.I., operated by Mr. Jacob Conn, to "go off the air" after Sept. 1. The decision is of national importance as laying down general principles which will govern the Cor mission's action in other similar cases.

More and more is the wisdom of the British quiet but firm control of broadcasting justified, judging from the above and the following paragraph :—

"In consequence of their alleged broadcasting of 'personal disputes,' four Pennsylvanian stations have been placed on probation for 30 days, says *World Radio*, pending a decision whether they shall be re-licensed or not."

Reuter's Agency states that the American Telegraph and Telephone Company has perfected a very sensitive submarine cable which, according to the company, will make it possible for the first time to secure effective telephonic communication by cable between the U.S. and England.

It is stated that this new cable promises more reliable service than that given by the best wireless methods known. The construction of such a cable for long-distance purposes is under consideration.

A New York correspondent of the London *Times Engineering Supplement* recently informed its readers of an automatic device, which utilises the hum of an aeroplane engine to close the circuit of an airport lighting system and has recently been designed by the Westinghouse Electric and Manufacturing Company, East Pittsburgh, Pa. The device is so sensitive that it functions when the aeroplane is still 1,500 ft. above the landing field, yet has such selective qualities that it will not respond to any sound except that of an aeroplane engine.

The device consists of a microphone, resonant and amplifying circuits, a time element relay and contactors. The hum of the engine is picked up by the microphone, which is mounted in a vertical position so that it will best catch sound waves from the air above. The current thus induced in the microphone circuit is transmitted to a resonant circuit tuned to the frequency of the hum of the engine, where it is amplified many times. The tuning of the resonant circuit eliminates such sounds as voices and the noises of motor vehicles' engines and horns. Further insurance that the device will be actuated only by the hum of an aeroplane engine is provided by the time element relay, which is so adjusted as to function only after the sound has persisted over an unbroken period of 10 seconds.

The great floodgates of an airport consume a considerable amount of electrical energy, and such an installation will effect a material saving, since the lights will go on only when they are actually needed.

The *Leviathan*, of the United States Lines, which sailed from New York, on one of its recent voyages was guided to Southampton by an instrument named the fathometer. This measures the depth of water continuously by timing electric echoes, and thus makes it possible for the navigating officers to plot their course as accurately in darkness and fog as in clear daylight.

The fathometer is a small instrument about 1 ft. square, which transmits electrical sounds downward from the keel. The time required for return of the echoes is timed to a fraction of a second, and is translated into terms of depth on a clocklike dial.

WEST INDIES.—The following extracts form part of the report of the Pacific Cable Board mentioned above under "Australia," and refer to the financial year ended March 31, 1928, on the working of the submarine cable system and wireless-telegraph stations of the West Indian Islands and British Guiana shows that the traffic receipts (£52,568) exceeded those of the previous year by £2,654. The net expenditure (£33,270) was £310 less than that of the preceding year. The surplus of receipts over net expenditure amounted to £20,013, compared with £16,831, and the deficiency to be made good by the contributing Governments in respect of the year under review is £12,070.

GENERAL AND PERSONAL.—*Private Companies.*—The directors of the Eastern Extension, Australasia & China Telegraph Co., Ltd., have declared an interim dividend for the three months ended June 30, 1928, of 5*s.* per share, free of tax.

The directors of the Eastern Telegraph Co., Ltd., announce the payment of a dividend of 2½% on the ordinary stock, free of tax, for the quarter ended June 30.

The directors of the Marconi International Marine Communication Co., Ltd., have declared an interim dividend of 7½%, actual, less tax (against 4% last year), and they state that the estimated profits for the year will enable them to declare a final dividend of the same amount. This will make a total of 15%, as compared with 12½% last year.

In view of the statement issued by the board of the Marconi's Wireless Telegraph Co., Ltd., on Aug. 3, concerning the proposed merger with the cable companies and at the instance of an influential body of holders of £1 ordinary shares, a committee has been formed for the purpose of concerted action, if necessary. The committee consists of the Hon. W. B. L. Barrington, Chairman (Helbert, Wagg & Co., Ltd.), Mr. B. H. Binder (Binder, Hamlyn & Co.), Mr. S. R. Cooke (Rowe & Pitman), and Mr. H. A. Vernet (Robert Benson & Co., Ltd.), with power to co-opt. Messrs. Binder, Hamlyn & Co. will act as secretaries to the committee.

For Our Advertisers.—Contracts Open.—Where not otherwise stated, quote reference and apply Department for Overseas Trade, London, S.W. :—

Postmaster-General's Department, Melbourne, Nov. 27.—Supply of indicators (schedule C. 371). (Reference B.X. 4,751.)

Postmaster-General's Department, Melbourne, Nov. 27.—Supply of condensers (schedule C. 370). (Reference B.X. 4,753.)

South African Posts and Telegraphs, Nov. 29.—Telephone apparatus for Pretoria. (Reference B.X. 4,757.)

Victorian Electricity Commission, Dec. 17.—Supply of metal-clad switchgear and accessories (specification 28/68).

South African Posts and Telegraphs, Pretoria, Dec. 13.—Supply of solder, copper wire and cable (D.O.T.).

South African Railways and Harbours, Johannesburg, Dec. 13.—Supply of one 7-ton electrical overhead travelling crane (tender No. 1347). (Reference AX. 6989.)

New Zealand Government Railways, Dec. 20.—Sub-station equipment, including switchgear, transformers and cables, for Frankton Junction power and signalling supply (specification No. 101). (Reference B.X. 4,771.)

The tragic death of Mr. H. L. Upcott, Asst. Superintendent, C.T.O., while on holiday with his wife and daughter at Tintagel, constitutes a very real loss to the C.T.O. and has left a gap in that large circle of his friends which cannot be filled up. Mr. Upcott was an idealist who kept those ideals unsullied throughout a strenuous life and work for others. Side by side with this idealism there was a strongly marked vein of the practical which made him a strong bulwark of any organisation with which he might become associated, and a leader whom men would follow and trust. Thus, to select Upcott as Secretary meant trustworthy and precise minutes, as Treasurer or Auditor a meticulous exactitude that would satisfy the most exacting chartered accountant. As one who knew Hubert Upcott well through more than three decades the writer, though unavoidably belated, could not do less than place these few inadequate tributes upon his grave.

The friends of Mr. H. C. Mathias, Executive Officer in the A.G.D., were deeply grieved to hear of his death on Sept. 30, after but a very brief illness. It is true that those who knew him more intimately were well aware that his health had been none too good for some time, but the cheery postcards from Seaford, where he had been recuperating not more than a fortnight prior to his decease, had led most of us to expect a return to something nearer normal health and strength.

Mr. Mathias was of a retiring disposition and modest in the extreme. To be within the circle of his friendship was a privilege. A staunch Churchman of the broad cultured and liberal type, he was much respected in Battersea, with which district he had been associated since 1896, where for 25 years he was lay reader at St. Barnabas, Clapham Common. For several years he was Secretary of the Ruridecanal Conference, but much to his deep regret he was compelled, under strict medical advice, to relinquish these and all similar activities three years ago.

The sincerest sympathy of a band of office friends, not only in his own particular department, but elsewhere in the Post Office, is tendered to Mrs. H. Mathias and her two orphaned daughters, and also to Mr. and Mrs. Mathias, senior, who, pathetically enough, hale and well in their 87th year, have now outlived all their children.

MAN.—Man with all his kith and kin counts for but an infinitesimal fraction of the surface of the earth, and yet it is the mind of man that has penetrated the cosmos and discovered the distant stars and nebulæ.—*Professor Donnan.* J. J. T.

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LONDON TELEPHONE SERVICE NOTES.

Central Branch Notes.

THE results obtained by the Contract Branch during the month of August represented a net gain of 2,676 stations, as compared with 3,164 for the corresponding month of last year. The fact that the installation at one of the large terminal stations was given up in favour of a privately-owned switchboard helped to reduce the figure for September this year.

The net gain for the quarter ended September amounted to 9,622 stations, as compared with 9,541 for the corresponding period last year.

Many people have been doing some hard thinking to find an explanation of the poor business obtained during the summer months, and particularly in September this year. Complaints that trade was bad were general—with the exception of a few favoured industries—and, apparently, were justified, as the export returns for September showed a very substantial decrease. The fact that 10 days out of the 30 were Saturdays and Sundays undoubtedly had an appreciable effect, but the fine weather seems to have made it into a real holiday month, when most people were intent on enjoying the sunshine either at home or away rather than thinking of such things as telephones as an aid to shopping in wet and wintry weather.

It is expected that the figures for October will show a substantial increase, especially as the net gain for the first week was 1,800 stations—appreciably more than half the net gain for the whole of September.

The number of exhibitors at this year's Motor Show was 536, as compared with 543 last year—and orders were taken this year for 399 exchange lines, as compared with 398 last year. In addition to the exchange lines, 49 call offices, B.B.C. circuits and private wires, &c., have been provided this year, making a grand total of 448 lines.

The following letter was received from a subscriber :—

> "I beg to confirm that owing to my tendency coming to an end at the end of next March quarter, I am unable to renew the subscription for another year."

This is a tendency that certainly ought not to be encouraged.

* * * *

The London Telephonists' Society.

On Friday, Oct. 5, the first meeting of the 1928-29 Session of the London Telephonists' Society was held in the Lecture Hall of the City of London Y.M.C.A., Aldersgate Street, E.C.4.

The meeting was timed to commence at 6.30 p.m., and arrangements were made for the members of the Society to be given the opportunity of meeting and talking to old friends, and during the half-hour preceding the meeting tea was served in the annexe to the Lecture Hall. The general hum of conversation sufficiently testified to the pleasure derived thereby, and at the same time indicated the anticipation with which the events to follow were regarded.

According to custom, the first meeting of the season was devoted to the Presidential Address, and as the President for the present year is Mr. Horace Dive, the enthusiasm with which his advent was regarded was amply justified by its effect.

The chair was taken by the retiring President, Miss R. James, who, in a few well-chosen words, presented Mr. Dive to his audience.

It would be impossible without extensive quotation to describe the paper which was read to us. It covered vast fields, literary and technical, which were presented with a charm which welded them into an indissoluble whole. Mr. Dive ended his paper on a note of high hope, painting the future of all, but of "Telephone" people in particular, in such a manner that one felt that the future was indeed "Something to look forward to."

The meeting concluded after a general discussion, during which Mr. Dive was wholeheartedly thanked for the very real pleasure he had given to all who had the privilege of listening to his address.

* * * *

Rana Ladies' Annual Gala.

The Annual Gala of the Rana Ladies' Swimming Club (Controller's Office) was held this year on Oct. 4, at St. George's Baths, and was attended by an enthusiastic audience composed of all ranks of the L.T.S., both male and female, from the Controller downwards.

The Lady Superintendent, Miss Liddiard, who is President of the Club, was there, and kindly distributed the prizes to the winners immediately after each race—an excellent arrangement, which saved a great deal of time. Mr. Reimann, with a megaphone, was in splendid form as the announcer of the events and their results.

The well-arranged programme was even more attractive than usual, and the organisers certainly have a "flair" for thinking out novel and amusing events. There was, for instance, a "Nippy Race," won by Miss B. L. Day, where the competitors had to don cap and apron and wade through the water with their trays. There was the "Breakfast Rush," an obstacle race, of course, where the unfortunate clerk, before setting out for the office, had to dive for his breakfast, eat it on a slippery pole, then dress as suitably as the damp garments provided would permit, and swim to the tube, represented by a hoop.

More than one competitor arrived at this stage having lost her stocking *en route*, but Miss D. Hesse finished an easy first with her full complement of clothes.

The most amusing event, however, was the "Broncho Race." Each girl had to swim astride a fierce-looking steed of inflated rubber, but the animals proved so extraordinarily difficult to start, and so intractable, that the audience laughed uninterruptedly for quite ten minutes. Miss Shadbolt managed very pluckily, but even she arrived first at the winning post much more off than on her mount.

"Woodland Revels" was another event much appreciated by the audience, because of the charming way in which it was arranged. Three teams of girls transformed themselves before our eyes into fairies, elves and witches, and raced for toadstools and broomsticks.

A very wonderful exhibition of ornamental and fancy swimming was given by Mr. G. A. Wilkinson, of the Otter S.C., who was able to perform the most difficult feats both in and out of the water with the utmost ease and gracefulness. He could literally swim like any and every kind of fish, and the audience watched fascinated and with bated breath his imitations of a torpedo and a submarine.

Amongst the remaining events, which included some fine diving and life-saving displays, one must not forget to mention the exciting relay race between male members of the Accounts and Traffic Branches for the "Lotus" Shield, which was carried off by the Traffic; and the Championship for the "Liddiard" Cup, which was retained by the holder, Miss B. E. D. Taylor.

Altogether a most interesting and successful entertainment.

P. M.

Correction.

The result of the L.T.S. Plunging Championship was given incorrectly last month. The correct result was :—

Miss Brain, Royal Exchange	...	...	...	1
Miss Mason, Avenue „	...	...	...	2
Miss Powell, Trunk „	...	...	...	3

* * * *

Football.

There is a variation of the old adage which says that a bird in the hand is worth three up a tree, and good mid-field displays yielding no goals and points do not make league champions. A reminder that goals count in the struggle for honours was exemplified in the second league game of the season, played at Chiswick against the Board of Education.

We won by 3 goals to one, and probably the Board are still wondering how this was accomplished. Territorially the Board of Education enjoyed quite as much of the play as the home team, and it seemed at times that goals must accrue. Somehow, however, good leading-up play was wasted in front of goal or frustrated by relentless tackling by Smith and Thomson, the backs. Williams, also, was very sound in goal. London Telephone Service won because they proved to be the better opportunists.

The opening game of the season, against the Ministry of Health, was a much easier victory, and the margin of 3 goals to none does not over-estimate the difference between the two teams. Whilst it is satisfactory to record two opening wins, it is evident that the team requires strengthening in some departments, notably in the forwards, and it will probably be found necessary to make one or two experiments before a satisfactory combination is found.

The club will have held their first social event, a Dance, by the time these notes appear in print, but others will follow in the Dining Hall of the Cornwall House Refreshment Club during the season, and will be announced from time to time.

"THE G.P.O. PLAYERS" DRAMATIC SOCIETY.

IT is difficult to recall any play of recent years which has caused more discussion than "Outward Bound." Is there a Divinity which shapes our ends; or—is the fault, dear Brutus, in ourselves, that we are underlings? To this eternal question, Mr. Sutton Vane essays an answer. He limns, with inimitable skill, the salutary sense of comedy in humanity present even in the most tragic circumstances.

Literally, this is the drama of Life and Death. And the victor is life. It is a play for every man who has a heart to be touched or a sense of humour to be tickled.

The Society's production of the play, under the direction of Julien Mitchell (Director of the Julien Mitchell Repertory Company) will take place at King George's Hall, Caroline Street, Great Russell Street, W.C.—two minutes Tottenham Court Road Station—on Friday and Saturday, Nov. 9 and 10, commencing at 7.30 p.m. Tickets, 5*s.* 9*d.*, 3*s.* 6*d.*, 2*s.* 4*d.* (all reserved), may be obtained, post free, from the Honorary Treasurer, Mr. J. Scott, Room 12, Third Floor, G.P.O. North, E.C.1.

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PROGRESS OF THE TELEPHONE SYSTEM.

THE total number of telephone stations in the Post Office system at Aug. 31, 1928, was 1,677,956, or 8,862 more than at the end of the previous month.

The growth for the month of August is summarised below :—

	London.	*Provinces.*
Telephone Stations—		
Total at August 31	595,342	1,082,614
Net increase for month	2,789	6,073
Residence Rate Subscribers—		
Total	138,782	220,903
Net increase	874	1,900
Call Office Stations—		
Total	5,400	19,525
Net increase	30	138
Kiosks—		
Total	1,081	4,392
Net increase	37	136
Rural Party Line Stations—		
Total	—	10,314
Net increase	—	46
Rural Railway Stations connected with Exchange System—		
Total	—	975
Net increase	—	12

The total number of inland trunk calls dealt with during June, 1928 (the latest statistics available), was 9,214,037, an increase of 751,638 or 8.9% over the corresponding month last year.

Outgoing international calls in June numbered 36,802, and incoming international calls 39,899, representing increases of 10,761 (41.3%) and 12,087 (43.5%), respectively, over June, 1927.

Further progress was made during the month of September with the development of the local exchange system. New exchanges opened included the following :—

LONDON—Abercorn, Bermondsey (automatic), Mansion House, Monument, Tudor, Welbeck,

and among the more important exchanges extended were—

LONDON—Bushey Heath, Eltham, Hounslow, Hendon, Molesey, Putney, Riverside, Temple Bar, Terminus, Upper Warlingham ;

PROVINCES—Cheltenham (automatic), Clacton-on-Sea, Crewe, Dudley (automatic), Guildford, Langside, Linthorpe, Port Talbot, Tattenhall.

Seventy-one new overhead trunk circuits were completed, and 82 additional circuits were provided by means of spare wires in underground cables.

NATIONAL TELEPHONE COMPANY STAFF RE-UNION DINNER, 1928.

THE response to the brief intimation made last month of a proposed gathering in London of the staff of the late National Telephone Company has been so hearty and widespread that the two largest rooms in the New Criterion Restaurant in Piccadilly Circus—the Victoria Hall and the ballroom—have been secured for Monday, Dec. 10 and the time for the dinner fixed at 7 for 7.30 (Morning Dress).

All men and women who were at any time in the service of the National Telephone Company or of any of the preceding and constituent companies are heartily invited to attend this entirely unofficial gathering of former telephone colleagues. The total number of diners who can be accommodated is limited and tickets will be allotted in order of application. Subject to this unavoidable limit all friends who have been associated with the telephone industry prior to the transfer in 1912, as well as any Post Office officers who desire to be present will be welcome. It is therefore hoped that the gathering will include all the telephone pioneers in the country.

The Committee in charge of the arrangements for the gathering will provide every facility for those present to meet all old friends.

The price of the tickets is 7*s.* 6*d.* each and applications accompanied by a remittance should be sent to Mr. H. M. Darville, the Hon. Treasurer, "Kildare," 198, High Road, Wealdstone, Middlesex. Local representatives will act in the various large offices in London, so that remittances for tickets may be made in bulk to Mr. Darville.

Lord Harris, the surviving Director of the National Telephone Company hopes to attend the dinner as well as Mr. Anns, Mr. Goddard, Mr. Gill and Mr. Cook.

Messrs. Sinclair, Chambers, Coleman, Dalzell, Phillips, Preston, Shepherd and other principal officers of the old company are also expected.

Lieut.-Col. C. B. Clay will be in the Chair. The Secretary of the Arrangements Committee is Mr. T. A. Prout, 17, The Chine, London, N.21.

THE C.O.D.O.C. AGAIN !

"OWING to the length of the Opera no encores will be given," was the dictum which was prominently displayed on the programme of the C.T.O. Operatic, Dramatic, and Orchestral Club's production of the comic opera founded upon Fielding's novel and so charmingly set to music by Edward German. Certainly the dictum was necessary, and was adhered to most strictly, or surely some of us would have lost our last trains, for there was no doubt whatever concerning this further success, which must be added to the laurels of the C.O.D.O.C. talent and organisation.

If one were to pick out a name or two the selection might appear invidious where the team work was undoubtedly so excellently maintained.

When one is so closely associated with the C.T.O. one may well distrust one's judgment. The verdict, however, which was passed on the first night's performance (the writer was present on the second night only) by a gentleman friend who had never before seen any of the Club's productions, but whose standard is certainly that of the West End, was as follows : "There was scarcely a touch of the amateur about the whole thing from A to Z."

I cannot do better than leave it at that.

J. J. T.

MANCHESTER NOTES.

ON the evening of Oct. 1 the Supervising Staff of the Manchester District assembled to hear the first of a series of lectures on the Automatic System, which is to be given during the winter months by Mr. J. L. Parry, the Traffic Superintendent.

Practically every Supervising Officer was present when Mr. J. T. Whitelaw, the District Manager, rose to preface the initial lecture with a few remarks of appreciation. He expressed the view that the unanimous response the Supervising Officers had made to the opportunity now being afforded was a good omen for the not far distant time when the Manchester Director Scheme would be in operation.

Mr. Parry then briefly traversed the history of manual switching equipment and stated the considerations which had led to the adoption of the automatic system.

The working of the dial, line relay and rotary line switch were explained in some detail, use being made of slides, diagrams and a number of parts of the apparatus for the purpose of illustration.

The meeting closed with an examination of the apparatus available, several interesting questions being asked and answered.

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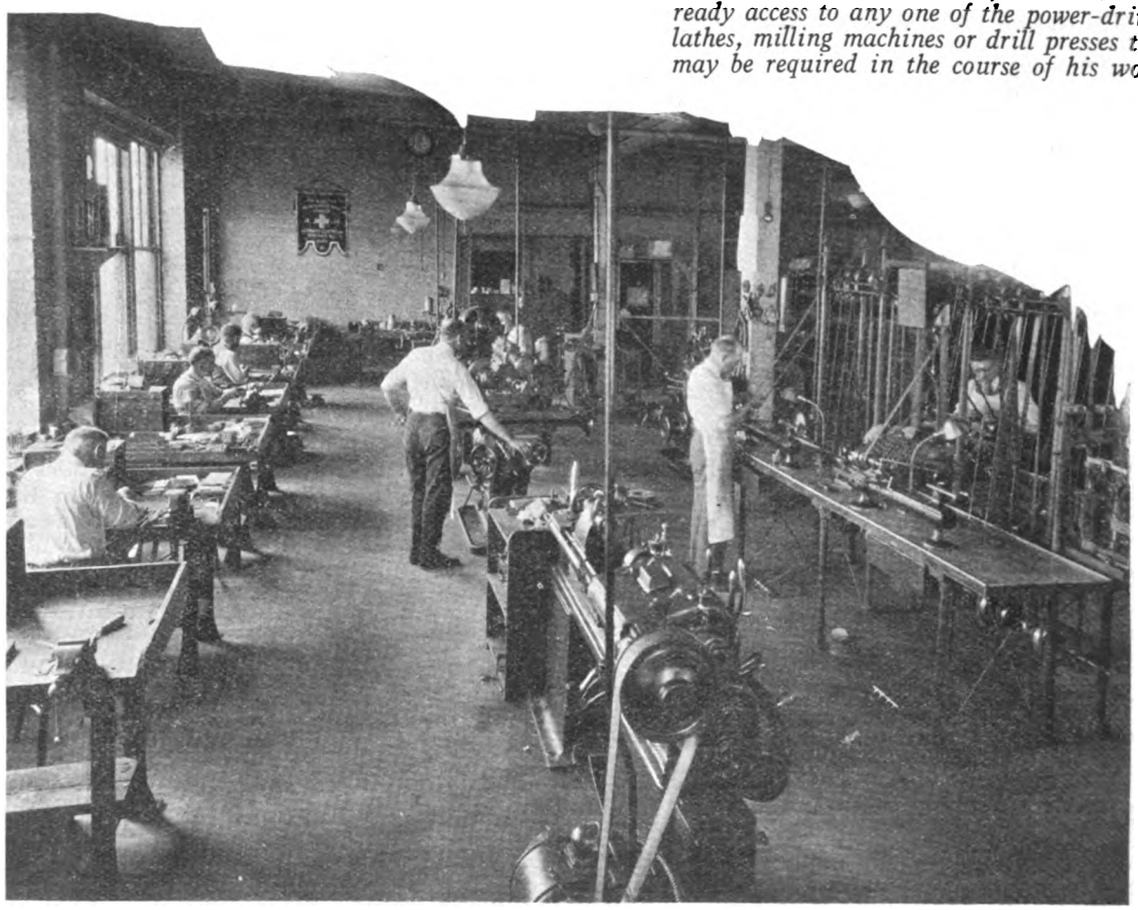
Where Strowger Auto

The

The accompanying view shows the well lighted and completely equipped model shop of the Research and Development Department. Each expert machinist has his own individual workbench, and also has ready access to any one of the power-driven lathes, milling machines or drill presses that may be required in the course of his work.



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The
Telegraph and Telephone Journal.

PUBLISHED MONTHLY IN THE INTERESTS OF THE TELEGRAPH AND TELEPHONE SERVICE, UNDER THE PATRONAGE OF THE POSTMASTER-GENERAL.

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NOTICES.

As the object of the JOURNAL *is the interchange of information on all subjects affecting the Telegraph and Telephone Service, the Managing Editor will be glad to consider contributions, and all communications together with photographs, diagrams, or other illustrations, should be addressed to him at the G.P.O. North, London, E.C.*1. *The Managing Editor will not be responsible for any manuscripts which he finds himself unable to use, but he will take the utmost care to return such manuscripts as promptly as possible. Photographs illustrating accepted articles will be returned if desired.*

VOL. XV. NOVEMBER, 1928. No. 164.

TALKING TO PEOPLE ABROAD.

IN the interesting and instructive paper on International Telephony which Mr. Frank Gill read last month before the London Telephone and Telegraph Society and which we reprint in another column, he made a reference to "Personal calls." As we consider this question is one of great significance for the successful development of European international telephony, we take this opportunity of expounding at some length our views on the scope of this class of service.

It need hardly, perhaps, be insisted on that long-distance telephone service is mostly used by business men; and a large proportion of the three thousand daily conversations between this country and the Continent are business calls between people speaking from their offices. Many firms maintain as part of their ordinary organisation a staff of people qualified to conduct their foreign telephone business. Such houses have someone always in attendance during office hours whose duty is, not only to answer the telephone promptly—a job which only too many firms unfortunately still seem to think can be adequately done by anyone who happens to be temporarily disengaged—but also to deal over the telephone in a responsible capacity with the foreign enquirer's business. For routine foreign business between firms of this type at home and abroad a prompt and reliable service from telephone to telephone is probably all that is wanted; and hitherto the efforts of the authorities have been directed to seeing that it is provided on all the Anglo-Continental telephone routes.

But there is another class of foreign business for which the telephone is also useful—even more useful, perhaps essential—the kind of business which can only be done by a personal talk between heads of firms or their departmental chiefs. For this class of work it is not enough to put the subscriber in touch with the telephone abroad whose number he has called; it is necessary to get on that telephone the particular man he wants to talk to, and to get him as soon as possible. In other words, the subscriber wants the telephone administrations to provide him with a "Personal Call Service" to his foreign correspondent's country. There are three requirements which such a service must fulfil if it is to meet the business man's needs.

(1) The telephone administrations at each end must co-operate with their subscribers as far as they can in finding the particular person wanted, whom the caller, of course, designates by name as well as by his telephone number when booking the call. For this additional service the administrations make a supplementary charge.

(2) If, for any reason, the person wanted at the other end cannot be found and put on the telephone—e.g., if he is neither in his office nor at home, nor obtainable at some other known telephone in the neighbourhood—the caller ought not to have to pay the full price for a call, but only the fixed supplementary "personal charge" in respect of the work which has been done in trying to find the person he wants.

(3) When the person wanted has been found and put on the telephone, the caller pays for his conversation according to its duration at the usual rates, in addition to the fixed supplementary charge for the work of search. It may happen, however, that a little time is lost, after the two telephones, or private branch exchanges, in each country are called up in readiness for the personal call, before the caller and the person he wants can be got to their respective telephones and can begin to talk to each other. In such a case, this lost time, within a reasonable fixed limit, should not be charged for; the charge at so much a minute for the 3, 4 or 10 minutes' talk, as the case may be, should only begin to run when the real personal call commences, i.e., from the moment when the caller and his correspondent are put in telephonic touch with each other.

It is a well-known axiom of telephone service that the co-operation of at least four persons is needed in the setting-up of a call, viz., that of two or more operators and two subscribers, and that a prompt answer by the called subscriber is an essential for the maintenance of a rapid service. This is especially important where international calls are concerned, because of the greater monetary value of the time at stake. While on the one hand the successful working of a personal call service requires a specially high degree of co-operation between the subscribers and their telephone administrations—e.g., in conveying promptly and accurately information about the whereabouts of the person called—on the other hand the regular practice of this co-operation cannot fail to react favourably in furthering the good relations between all concerned which are so essential to an efficient, and in particular to a speedy, service.

Now that the Anglo-Continental telephone services are showing such healthy and rapid development, the need for an optional

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service of personal calls, to supplement the existing ordinary service, is being felt; and we understand that the British authorities hope it may be possible to arrange with the various foreign telephone administrations concerned to introduce such a service. A considerable amount of preparatory work, however, will be involved. Both the principles and the operating details (which must, of course, be uniform) have to be agreed between the two administrations interested in each of the Anglo-Continental routes. (On a few of the longest Anglo-Continental telephone routes, which are at an early stage of development, the calls are switched through to their destination at an exchange in one of the intermediate countries through which the line passes; for a personal call service on these routes, the co-operation of a third administration—the one in whose country the calls are switched—will be necessary.) At present, unfortunately, apart from the transatlantic person-to-person telephone service, which is now available, via London, to most of Western Europe, there is no personal call service meeting the above-described essential requirements on the Continent of Europe outside Scandinavia. (There, however, such a service has been worked successfully for some time, and is, we are informed, very popular.) Preliminary discussion will, therefore, probably be necessary before the new scheme can be launched—at all events generally—on the Anglo-Continental telephone routes; but it may be hoped that the efficient consultative machinery which now exists through the medium of the "C.C.I." will enable the difficulties to be successfully surmounted.

There is every reason to think that the personal call service will not only be used for business calls, but that it will also do much to encourage the nascent habit of talking over the telephone with one's friends on the Continent. To anyone thinking of ringing up a friend abroad it will naturally be an especial attraction no longer to have to hazard the price of a 3-minute call on the mere chance of finding his correspondent in, say, at his hotel, at some particular moment.

TELEGRAPHIC MATTERS.

WE wish to draw the attention of our colleagues on the Telegraph side to the fact that we do not hear from them with such frequency or regularity as we do from the Telephone side. We should like not only to receive articles on current telegraph problems, but we should be glad to publish "telegraph notes" of staff doings in the large centres, and occasional paragraphs on the retirements, promotions, &c., of the kind that reach us regarding telephone staff, in reference to telegraph officials. Articles on telephonic subjects have lately tended to preponderate in the columns of the *Journal*, and we invite the co-operation of our readers to assist in redressing the balance.

We have made arrangements for the provision of some special articles dealing with the activities of the senior branch of the two services, and are publishing one this month on the recent Telegraph Conference in Brussels. The Telegraph and Telephone Society promise us papers on telegraphy in the past, the future, and on developments in America, and no doubt these papers will afford much food for thought and serve as a stimulus to our correspondents.

The average citizen, when he considers the ever-increasing development of the telephone in all countries and the many important extensions of overseas communication which have taken place in recent—and especially the most recent—years, is apt to forget the less spectacular achievements of the far-flung and dependable telegraph network of the world. That network neither slumbers nor sleeps, but hums with a ceaseless activity of which there is much to record, and from which there is still much to learn. It still holds many a field and reaches many a remote spot whence instant communication with the outside world is not otherwise obtainable. Its future no man can predict, but it is difficult to conceive a time when it will not provide a complementary and indispensable sister service to that given by the telephone.

HIC ET UBIQUE.

LAST month saw the installation of the 600,000th telephone in the London area. This area includes more than one-third of the telephones in all Great Britain and Northern Ireland, which we estimate at the present moment to be about 1,730,000.

The Anglo-Italian telephone service, hitherto limited to communication with Milan, was extended on Oct. 18 to Turin and Geneva. Communication with these places is at present restricted to the London area. The charge for a 3 minute day call is 9*s*. 6*d*. to Turin and 10*s*. 9*d*. to Genoa.

According to a Reuter telegram, long-distance wireless telephone communication was established on Oct. 5 between Bandoeng (Java) and Buenos Aires via Kooten and Nauen (near Berlin).

Although communication was actually established the experiment was not entirely successful, and the trials will be continued.

On Jan. 1, 1929, according to the *Telegraph and Telephone Age*, the old Chinese number way, which to all intent and purpose was a code way of sending telegrams, will be displaced by an entirely new system based upon phonetics. It is simple and covers the thousand and more characters which go to make up the Chinese language. Thus, for the first time, the Chinese will be able to send telegrams in their own tongue. Some idea of the tremendous amount of work involved in this drastic yet progressive change may be had from the fact that no less than 15 years of research by a specially appointed commission headed by the American-trained Dr. C. C. Wang, have been required to make this phonetic system practicable.

We are informed that an automatic telephone system, with about 390 subscribers, has been opened in Smyrna by the Ericsson Company.

Beneath a comic drawing of a telephone lay-out in an American telephone journal is the legend: "Draftsman goes nutty. He tried to make a drawing foolproof!" We have come across the expressions "batty," "dotty," "dippy," "potty," "scatty," "sappy" and "loopy," and therefore take it that "nutty" means "mad," on the assumption that any consonant, short vowel, double consonant (preferably p or t) and y have this signification in the American language.

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INTERNATIONAL TELEPHONY.*

BY F. GILL, O.B.E. (*Past President I.E.E., Vice-President International Telephone and Telegraph Corporation*).

IN January, 1923, over 5½ years ago, I spoke before this Society on, among other things, the urgent need for a new outlook on long-distance telephone service in Europe. Since then there has been a very radical change in this service, and Mr. Trayfoot told you a great deal about this subject last session, but I do not want to go over his ground again.

Let us begin our historical review by seeing what happened in this service between England and other places overseas. Fig. 1 begins with service opened with France in 1891; 12 years later, in 1903, came service with Belgium; 11 years later, in 1914, service with Switzerland began, and in 8 years more (which included the War years), in 1922, came service with Holland.

Then in 1923 the French Telephone Administration took a very momentous step. It called together a Preliminary Committee to consider what should be done to make better provision for dealing with the International service. As a result of this meeting the C.C.I. (Telephones) was formed in 1924; the first President was the late M. Denery, succeeded, on his untimely decease, by another Frenchman, M. Milon. The Secretary-General throughout has been M. Valensi. In assessing the good work which has been done by the C.C.I. this special contribution by France should not be forgotten.

In 1926 service with Germany began. In the next year, 1927, 5 services to Europe and 3 to North America† were opened, and in the present year, 8 places in Europe, 1 in North America, and 1 in Africa, were opened.

We have, therefore, between 1891 and 1923—32 years producing 4 services; since 1923, 5¾ years producing 15 services in or through Europe, as well as 4 in North America.

Fig. 2 shows the extent of the service between England and the Continent at Oct. 1 1928.

To illustrate to myself and others in a rough-and-ready fashion the progress taking place, I have been accustomed to consider the service between a number of capital and other cities in Europe, the number of cities being 19. It is obvious that the total number of possible services is $19 \times 18/2 = 171$. At the end of 1922, before the C.C.I. was formed, there were 28 of these services, = 16.4%, and of these 28, only 6 involved an intermediate or transit country—all the other 22 were between contiguous countries.

1	of	these	19	towns	had	10	connections.
1	„	„	19	„	„	6	„
4	„	„	19	„	„	4	„
6	„	„	19	„	„	3	„
2	„	„	19	„	„	2	„
2	„	„	19	„	„	1	„
3	„	„	19	„	„	no	„

By 1925 the number of services to other countries had increased by 2 and was then 29 out of the 171, or 17%. See Fig. 3.‡

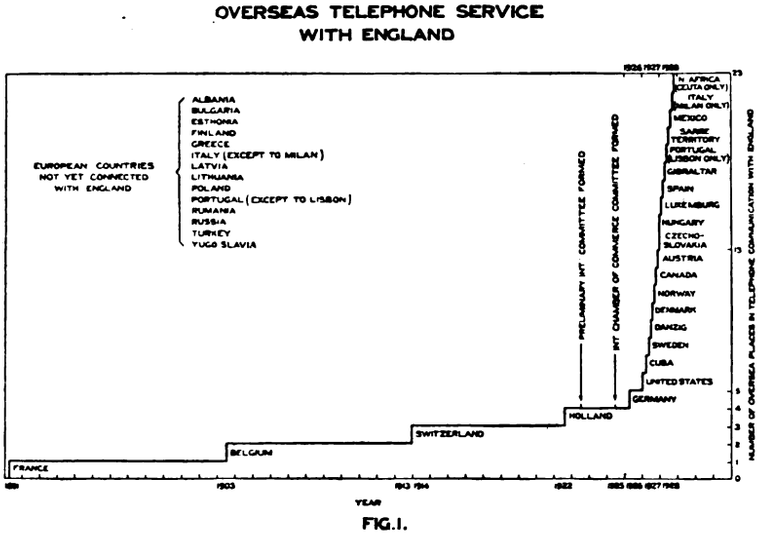

FIG. 1.

But by May, 1928, the work of the C.C.I. had become apparent; the number of these services had grown to 87 out of the 171, an increase of 60, or 50.9%, and by Oct. 1, 1928, as shown in Fig. 4‡, the number had increased to 98 or 57.3%.

A great advance has been made in the degree of transmission given over the International lines. Speech which was previously difficult and unsatisfactory has, in very many cases, become easy and the improvements continue as from time to time new areas of local territories are admitted to the International System.

FIG. 2.

Another advance which should be mentioned is the reduction in the time elapsing between the ordering of a call and commencement of conversation. Here are some C.C.I. records of average delays in minutes, during busy hours:—

	1925.	1927.	*Last quarter of* 1927. (*The latest records available.*)
Berlin—Paris	130	68	34
„ —Vienna	143	62	43
„ —Stockholm	89	39	30
London—Amsterdam ...	61	34	32
„ —Brussels	31	19	8
Paris—Brussels	180	180	100
„ —Turin	180	10	10
Stockholm—Copenhagen ...	8	8	13

But lest it should be thought that all delays are no longer than those shown in the third column, let me say that in the last records there are many cases of average delays in busy hours of 60 minutes and over.

Another advance lies in the changes in service offered, e.g.,
Charging for each minute after 3 minutes instead of by unit of 3 minutes.
Fixed time and subscription calls made available.
"Notice" (préavis) calls have been introduced.

It is sometimes said that Toll Cables and Repeaters were developed during the War, and that, of course, the instrumentalities available were very different after the War. Of course, that is true, but it is not the explanation of the lack of service at the beginning of 1923.

For years, overhead bare wires had been the recognised means of transmitting speech; the London—Paris circuit, involving a submarine cable, had been in operation since 1891, 32 years. New York—Chicago circuit, 1,187 kms. long (736 miles) had been in operation since 1892. It is true that it is easier and more economical to give service now with our present facilities, but the real explanation for the lack of long-distance service in Europe was the absence of any organisation to deal with it.

Thus far we have great encouragement from the relatively rapid advance made recently, and we may well stop for a moment to acknowledge all that the C.C.I. has achieved and to express admiration and gratitude in respect of its work.

* Paper read before the Post Office Telephone and Telegraph Society of London on Oct. 15 1928.

† The American services were developed apart from the C.C.I.

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But while according our full admiration, perhaps we shall do best to leave, for the moment, the things which are behind us and fix attention rather on the things which are in front and remain to be done. We must not forget that all these places are within easy telephonic reach of each other, that they are capital (or equivalent) cities of the countries, and that the history has shown that traffic is all the time waiting for facilities.

There still remain, after 5¾ years, about 42% of these cities without connexion with each other. There still remain some cities which are very badly served by International connexions. Perhaps there will still remain, when all these 19 cities are taken care of, other important cities in Europe not connected, and there will certainly be places just outside Europe still unconnected. Obviously, therefore, it is not yet time for a folding of the hands, nor for contentment with what has been accomplished.

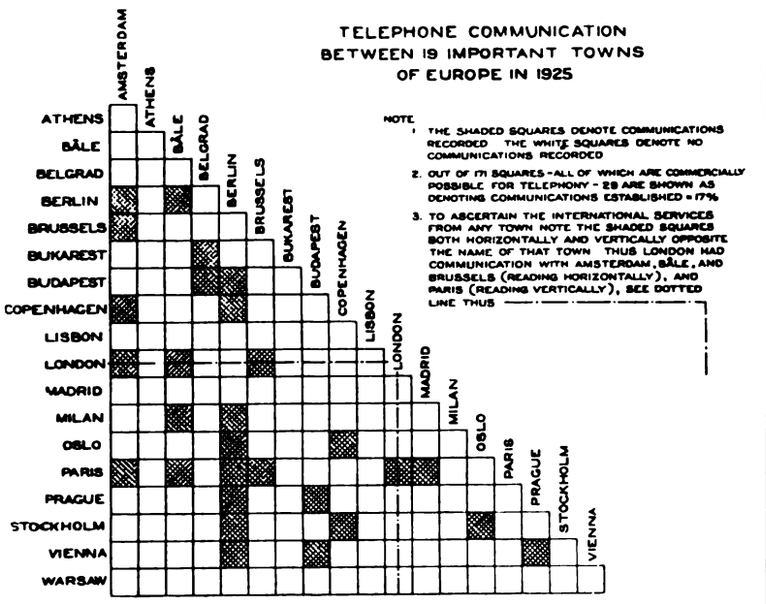

FIG. 3.

Fig. 5 shows a map of 1922; it shows some United States Long Lines then in every-day use projected on the map of Europe. To-day the longest line (practical crow-fly measurement), between International Toll Terminating Centres in public service is Lisbon to Berlin, about 2,310 kms. (1,430 miles). Although this length could be extended by considering the full distance covered between subscriber and subscriber, yet Europe of 1928 is still a long way behind the United States of 1922.

The time has come to extend our 19 cities. Fig. 6 gives the list extended to 34 towns; none of these can be dismissed as fantastic. The services which are now in operation, so far as I am aware of them, are shown shaded and the extent which they are available to the public is 29.8% on Oct. 1, 1928.

Towards the extension of service to these places, there were completed in Europe in 1927 5,000 kms. (3,100 miles) of Toll Cable. The most notable cases were Austria, nearly 800 kms., France over 1,000 kms., Belgium 460 kms., and Germany about 1,000 kms.

The International Chamber of Commerce.

We have spoken of the C.C.I. Telephones; there is another factor which should be mentioned, the International Chamber of Commerce, which first took up the question at Brussels in 1925 and has throughout operated with the full knowledge of the C.C.I., whose Secretary-General attends the meetings of the I.C.C. International Telephone Committee, and who has been very good in supplying information. The International Chamber of Commerce has placed on record its ideas of the importance of International Telephony, and the same applies to National service as well. The Report of the Stockholm Congress in 1927 states:—

"*The Importance of International Telephony.*

In the consideration of the subject by the Committee there early developed a growing realisation of the importance of international telephone service—

(*a*) As an effective instrumentality for removing impediments to international trade; and

(*b*) that the ability to secure speedy personal communication between distant cities should be a factor in stabilising business through a more orderly and economic movement of goods;

(*c*) that effective telephone service tends to facilitate all the processes of production and distribution;

(*d*) that ability to communicate information quickly, tends to minimise the range of price fluctuations and thereby lessen the tendency to speculation;

(*e*) that any instrumentality which tends to stabilise business, facilitate its processes, and effectively extend the field of operations with consequent increase in the volume of trade, should lessen the difficulties of international settlements, as after all, all settlements have to be made ultimately in goods or services;

(*f*) that the ability to communicate voice-to-voice, easily and speedily, whenever desired or needed, cannot but be a means of improving social relationships and developing a common economic and social viewpoint which inevitably must have an effect in promoting a better understanding between nations."

In the meetings of this Committee it has been particularly noticeable that what the business men desired as expressed in the report presented at the Stockholm Congress in July, 1927, was:—

"Uniform, dependable, fast service with good audition between all important trading centres in Europe."

Is not that an eminently reasonable request, in keeping with your own ideals? When we couple with that the numerous evidences of rapidly-increasing traffic, is it not a worth-while job to follow energetically the development of this Long-Distance Service? In the year 1926-27 nearly 37% of the small surplus made by the British Telephone System came from the Continental Telephone Service, and it seems a fair assumption that this service is a profitable one, as indeed it should be.

Let us now look further to the future and to some of the things which apparently require attention.

Partial Service.

There are still some places which are connected with each other for less than the complete 24 hours of the day. In some other instances connexions are set up every alternate half hour to produce direct trunks, thus producing the effect that there is only connexion between A and B during each alternate half hour and between A and C during the other alternate half hours. This produces long delays.

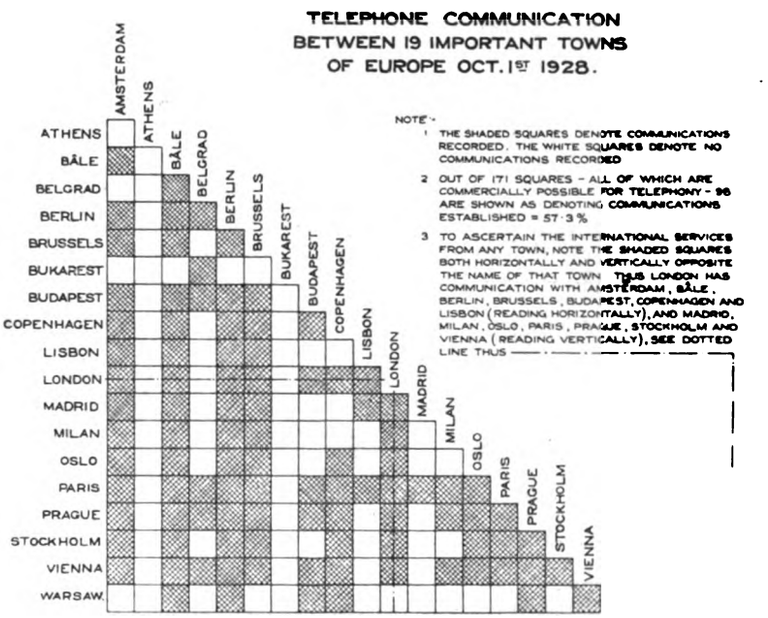

FIG. 4.

Toll Rate Principles.

There are two entirely different foundations for the Toll Rates in force in Europe. There is no difference in the degree of transmission afforded, and the two may be stated in condensed form thus:—

A.—Service is given at as cheap a rate as possible, this rate being termed "Ordinary." Ordinary calls should habitually experience a delay of not more than 30, 60, or 90 minutes, according to the length of the circuit. Calls may be ordered to be "Urgent" at triple ordinary rates, or to be very fast, "Lightning," at 10 times ordinary rates. Equipment is not intended to be provided to meet busy-hour loads, but is to be provided on the basis of the load spread out by reason of the delays permitted. Cheaper rates are in force in times of light traffic.

B.—All calls are of equal urgency and pay the same rate, called here the "Day" rates. A fast service with a delay not exceeding, say, 10 minutes, is aimed at. Equipment is provided to meet the busy-hour load. Cheaper rates are in force in times of light traffic.

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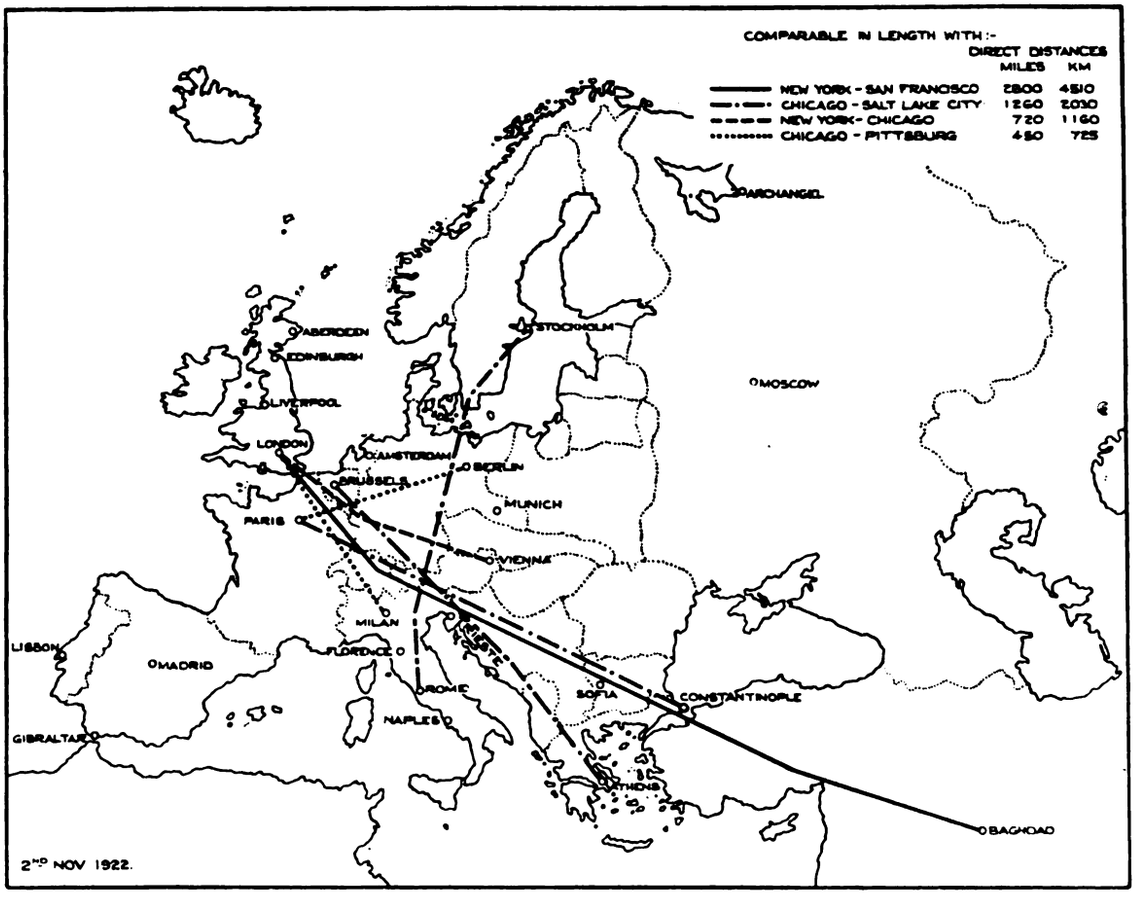

FIG. 5.

As would be expected, plan *A* leads to more calls per line per day, longer delays and a cheaper "Ordinary" rate. Plan *B* leads to fewer calls per line per day, a faster service and a "Day" rate which is dearer than the "Ordinary" rate under plan *A*.

But, obviously, the "Ordinary" rate may not be the rate paid by an individual, nor yet the average rate; this latter will depend upon the proportions of ordinary, urgent, and lightning calls.

To contrast the "Ordinary" Rates, plan *A*, with the "Day" Rates, plan *B*, is obviously misleading, yet it is constantly being done. Take a case of, say, between 700 and 800 kms.; at C.C.I. ordinary rates, the price is 6.4 gold francs. Against this take the London—Zurich day rate, 10.0 gold francs (about the same distance but including a submarine cable). But if we assume that out of 100 calls, 87 are ordinary, 12 are urgent, and 1 is lightning, then the average C.C.I. rate would be 8.51 gold francs, leaving 1.49 gold francs for the submarine cable to equal to the London—Zurich rate.

Or take the case where the ordinary calls are only 34%, the rest being at triple rates; the average price for 800 kms. at C.C.I. Rates would then be 14.85 gold francs.

Fig. 7 illustrates the C.C.I. Toll Rates as they vary in accordance with the proportion of Urgent calls.

Fig. 8 illustrates a published case; over a period of 16 months the percentage of call minutes at urgent rate rose from 45% to 66% and then fell to 16%, with a consequential great drop in revenue owing to the heavy falling-off in calls bringing in threefold fees, a loss not compensated for by general increase in Toll Traffic. The cause of the fall in urgent fees was that more trunks had been added and owing to a faster service, due to these additional facilities, there was less need to pay triple rates.

The right-hand part is the same curve reversed. I have assumed it is fair not only to consider what happens when the proportion of urgent fees falls off, but also when it increases. It increases because of congestion, subscribers making calls and suffering delays endeavour to mitigate their trouble by placing urgent orders. The scale at the right hand shows the average price ratio, assuming no lightning calls; in this assumption the average price ratio increases from 1.32 to 2.32, an increase of 76%. Is this likely to give satisfaction to the subscribers? Will they not examine their bills and feel that their calls are costing much more? Then when more trunks are added, as they must be, is not the Telephone Authority in a dilemma? If it improves the speed it may involve (in the case quoted it *did* involve) a loss in total revenue while, at the same time, it increases expenses.

One wonders—can there be a real place for lightning calls at 10 times the "ordinary" fee? If an urgent call at triple fee matures in *reasonable* time, it would seem unlikely that the speed could be so increased as to make a tenfold fee attractive; or conversely, if the tenfold fee calls are made, is it not rather because the urgent calls are much delayed and the ordinary calls are impossible? There are cases where the urgent calls over the whole day are about 70% of the total; probably that means that all the calls in the busy hours are urgent at triple rates. In some cases a lightning call passes out of that category into an urgent call if it does not mature in 15 minutes.

When it is found that the public pays a triple fee to reduce somewhat the average delays, is not that evidence that they are willing to back up your efforts to supply first-class service? Here are some figures of these delays:—

Examples of Average Delays in Minutes, Ordinary and Urgent, on the same Circuits in Busy Hours, 1927, C.C.I. Records.

On Ordinary Calls.	*On Urgent Calls.*	*% of Urgent Calls.*
20	8	10
13	6	2.4
16	9	4.5
71	41	12.5
18	5	1.8
38	17	not shown
41	28	"
33	13	"
90	36	"
120	48	"

All these points rather suggest that these special rates are founded upon old-time inadequate facilities, and will have to be abandoned in modern systems.

It is usual in Europe to consider the Toll Rates in the United States as altogether too high for Europe. But is that so, if we compare like with like, or as near as may be? In the A.T. & T. Report for the year 1927 it was stated:—

> "The average length of time for handling a toll call in the Bell System was reduced from 2 minutes in 1926 to 1½ minutes in 1927. About 90% of all toll calls are now handled while the subscriber remains at the telephone, as compared with 80% a year ago."

Take a case of a call between places, say, 1,430 kms. (890 miles) apart, and assume as near as may be similar service.

The Bell Long-Distance Rate for Person-to-Person service would be 23.40 gold francs for a 3-minute call.

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The C.C.I. Lightning Rate on direct trunk would be 100 gold francs for a 3-minute call. It is doubtful if the delay would be any less than the delay on the Bell System, and the service would be inferior, in that no Particular Person Service would be afforded and the individuals required would have to be sought after communication was established, which might increase the fee. The reason why no préavis is assumed in this case is that, with the very fast call there would be no time in which to send the preliminary notice.

The C.C.I. Urgent Rate, with préavis fee, would be 33.30 gold francs for a 3-minute call. The delay would almost certainly be considerably more than in the Bell System call.

But comparing rates in different countries by merely converting the currencies is liable to be misleading, because it takes no account of the *relative* burden which the rate imposes, because that method pays no attention to the wealth of the person paying the rate. If consideration be given to this point, the United States rates are a good deal cheaper than they appear to be.

I submit that all the evidence tends to show that Europe desires a high speed service, is willing to pay for it, and that it should be possible to provide it.

Another matter in Toll Rates that requires unification is the various methods at present employed in zoning International calls. Fig. 9 contrasts the steps which constitute a zone in Great Britain and Germany. Note that the position of the two curves does not imply any relative price comparison.

PERSON-TO-PERSON SERVICE.

Another service facility about which there is at present lack of uniformity is that of Person-to-Person calls.

Mr. Lignell, of the Swedish Administration, has shown that in the Swedish experience the demand for this service increases with the length of the circuit. This seems quite what would be expected. If *A* in London wants to talk to Vienna, it is likely that *A* wishes to get into communication with a definite individual, *B*, and it is probably not of much interest to *A* to talk to *B*'s office or hotel and be informed that *B* is absent. Further, the time lost in calling to the telephone the particular person whom *A* wants is a wasteful and serious inroad on the time paid for.

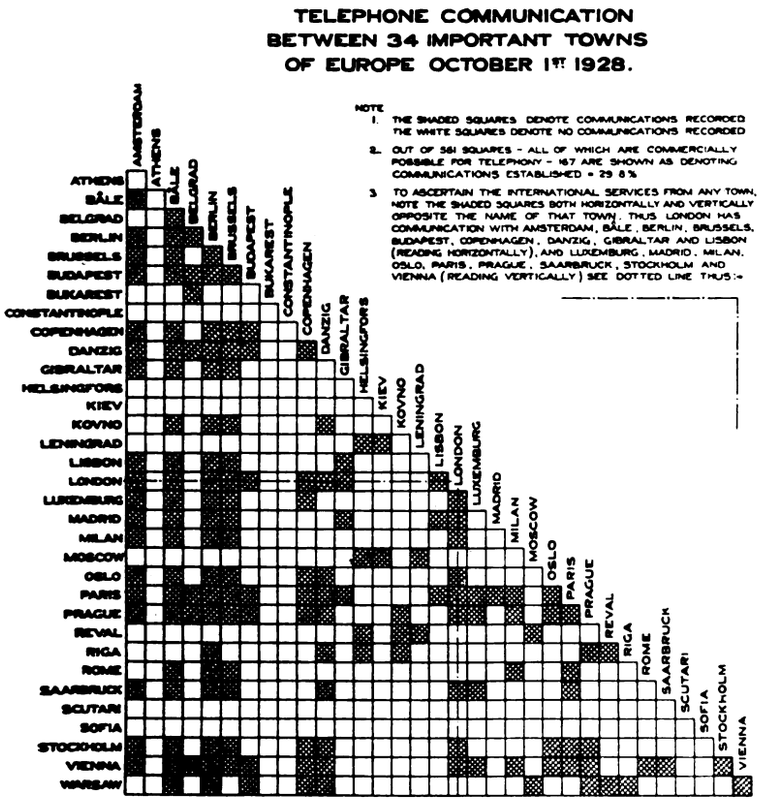

FIG. 6.

The person-to-person service gets rid of these objections; both the persons who are to talk are brought together at the moment of starting the time to be paid for, and the operating organisation receives an enhanced fee for the additional work it has to do.

At present Europe has in places, not with England, however, a service called préavis, which is a "sort of" person-to-person call. But it is not the real thing as you have it on the transatlantic service.

There is so much unprecise use of the words "subscriber" and "line," that in considering this kind of service it seems well to pose a case and to test any service offered on this case. Assume, then, a person A, from an extension on Holborn 1234, in London, wishes to talk with person B, who will be found on an extension on Carnot 5678, in Paris. The time to be paid for is not to begin until A and B are in conversation.

The complete préavis service is made up of two calls, a preliminary notice, the préavis, sent over the Trunk and given by the incoming Trunk operator to the wanted number, to the effect that a call will shortly be coming from (in the above case) London, and that B will be asked for. If B will be ready (and for our present purpose we need not follow other variations), the call proper will mature and be treated very much in the ordinary manner. Thus the préavis is the preliminary notification, it bears a separate fee which

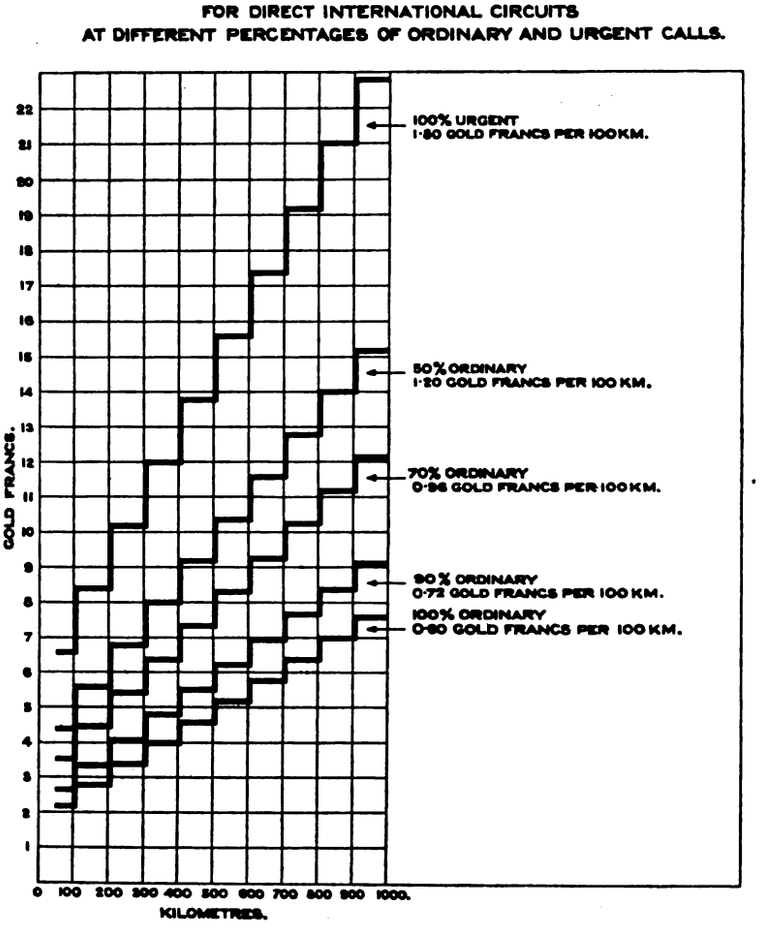

FIG. 7.

is based upon the unit fee, and it is followed by an ordinary call. In actual service the préavis practice differs. Sweden, in its connections with Norway and Denmark, puts the names of the two individuals on the ticket and when the call matures the operator gets these two persons into conversation before starting the time to be charged. But other countries do not go so far; they seem to be content with getting the two P.B.X.'s into connexion and start the time to be paid for from that moment. In fact, the actual call is an ordinary call with no precautions, except that when each of the two stations, or P.B.X.'s, reply, they are given the name of the individual wanted and the name of the distant town.

Substantially, Europe does not at present enjoy a person-to-person service, and with the increasing length of international lines this facility seems overdue. In considering the future of this kind of service, three statements seem likely to be true:—

The longer the connexion the greater the demand for person-to-person service.

The greater the person-to-person service the greater the demand for speedy service.

The more speedy the service the greater the likelihood of the préavis type of call being abandoned.

Since writing the above, I learn that the British Post Office has already made proposals for a real person-to-person service, and I hope that its efforts will be successful.

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Unused Facilities.

If we consider 4 wires giving telephone service on 2 channels, by means of suitable terminal arrangements and by proper transposition of the wires, we can make a third circuit without adding any more line wire, and the longer the line and the heavier the wires the more desirable economically does this third circuit become. In nearly all toll cables and on most open wire circuits this creation of a Phantom circuit is commonly employed.

But there are other facilities which at present are unused on international lines in Europe, although they offer great attractions. The same four wires, if of open bare wire construction, can, without robbing the telephone income in any way, also provide four independent two-way telegraph circuits, while if in cable there may be added two independent two-way telegraph circuits.

URGENT CALLS.

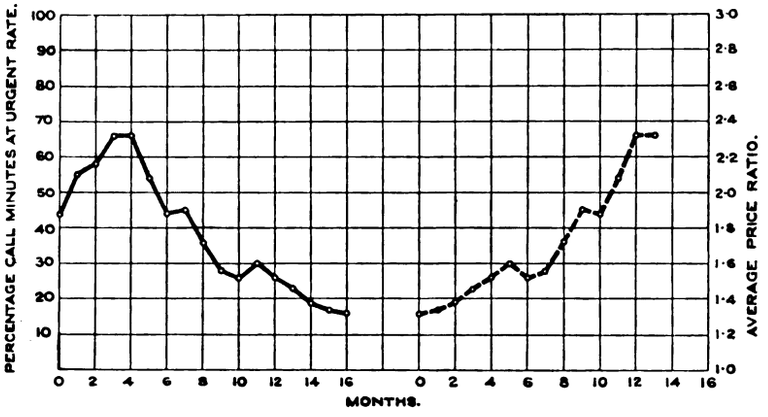

FIG. 8.

Fig. 10 shows in circles the three telephone rentals collectable from four open wires, these are very generally used. It further shows in squares the 4 telegraph revenues which may also be collected from the same wires and these last are practically neglected in Europe.

Fig. 11 shows in circles the three telephone rentals obtained from four cable wires and the two telegraph rentals which are being neglected. The illustration is for two-wire telephone circuits, the same telegraph revenues are possible if the telephone circuit is a four-wire one.

Again, on open wires, without detriment to the ordinary telephone rentals, we can, by carrier, add three other conversations simultaneously and thus in many cases increase the income-earning power of a pair of wires from $1\frac{1}{2}$ to $4\frac{1}{2}$, and with the two telegraphs, to $6\frac{1}{2}$ rentals, or on the same pair and without injury to the ordinary telephone rentals, we can add 12 two-way telegraph rentals, 10 being by carrier and two by composite apparatus. Or again, in a telephone toll cable which has spare circuits available, by giving up telephony on one pair, we can provide for six two-way telegraph rentals.

Now, since all these arrangements are made by apparatus, it is approximately correct to say that their attractiveness increases with the length of the line, and yet surprisingly little use is made of these facilities, even though the number and length of long lines is growing rapidly. The London—Madrid circuit is one of the very few such cases within my knowledge; in this case a pair of open wires between Versailles and Zaragoza, in addition to the ordinary telephone circuit and half a phantom, carries three telephone carrier channels with their accompanying rentals, and it could also carry two telegraph composite circuits.

There is another case between Copenhagen and Hamburg where two extra telegraph circuits are provided by composite. I understand also that there are some voice frequency telegraphs used on international telephone circuits in France.

Now more or less throughout Europe the Telegraph Departments are in financial difficulties, suffering from the competition of the telephone. Is there not in these extra facilities a means of reducing the annual cost of lines; may it not even be economical to cut down existing telegraph lines and use telegraph circuits which can be provided at little extra cost and be utilised either in the public service or leased as private wires at attractive rates. If, for example, at a cost which relatively is low, it is possible to operate 12 two-way telegraph circuits between, say, Paris and Vienna, over a four-wire telephone circuit, is it not possible, by suitably adjusting the rentals charged, to build up a profitable business by the use of these neglected facilities?

Possibly the fact that the long lines of Europe pass through more than one ownership is one reason why, apparently, no one seems to feel the urge to make the most of these long lines. Or it may be that there are difficulties in the fact that frequently there are practically two departments, the telephone and the telegraph, which have to see eye to eye before these facilities can be employed. But it does seem that full use is not being made of the money which has been expended. Perhaps this is a matter on which the C.C.I. (Telegraphs) could do good work.

The Future of International Telephony in Europe.

Why do we use the expression International Telephone Service as if it were something special and different to ordinary long distance service? The answer is one of organisation. In ordinary long distance service, the whole toll circuit and frequently both local ends are in the hands of the one administration, responsible for all the arrangements and in a position to take at short notice any action it may judge necessary.

But in the International service a Toll circuit belongs to and is operated by at least two authorities; there may be several more. Each of these authorities has its own sovereign powers, its own way of doing its work, its ideals of service, technique, hours of duty, costs and manner of charging the public.

A telephone message is not like a parcel or a train, which is handed on from moment to moment and does not occupy very much space at any one time. In telephony, the whole circuit is simultaneously and exclusively occupied with the one call; this should be so constructed, maintained and operated, that its different sections under different controllers are harmonious and operate as one whole.

I confess that I find it a very difficult thing to imagine this harmonious working carried to a high degree of efficiency under the present system of multi-control. Of course, a great deal has been, and undoubtedly in the future will be, done, but there are degrees of efficiency and it certainly seems to me that multi-control can never, with the best will in the world, produce results comparable with those given by unity of control.

The function of the C.C.I. so far, has been to form a common public opinion among the long-distance telephone authorities of Europe as to certain matters, such as specifications for the construction of long lines, rules regarding maintenance and some standardisation of traffic and rating matters, though these two are not as advanced as what is known as the Transmission Section. But in daily operation of the service much more than common opinion or a book of rules is required. At present no one person is in charge of general

ZONES.

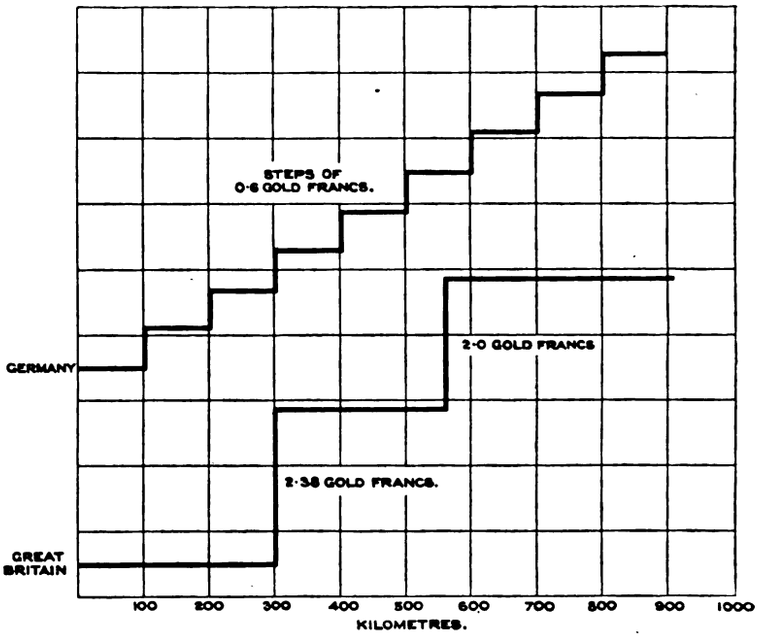

FIG. 9.

policies and decisions; no one is able to lay out new circuits which the traffic requires, nor to make definite programmes and budgets, nor to make schedules for carrying out works. No one can make new rates and services, all these require prolonged collaboration. No one is in charge of the maintenance; a trouble in one control area may cause great difficulties in that of another, without involving any responsibility on the first.

In ordinary business where the work of a number of people has to be closely co-ordinated to produce success, one of the ways of increasing the efficiency is by comparing the results of districts and divisions, and then devoting attention to the places thus shown to be relatively weak; by this procedure eliminating the weak points and progressively enhancing the efficiency of the strong places. This method of comparison is entirely missing at present and even if weak places were known there is no common machinery for strengthening them, nor indeed any single authority to decide what the

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treatment should be. Imagine the Trunk service in this country were each large Trunk area independent, and if no observations, statistics or information from each of these divisions came to a single authoritative head and therefore no common supervision; or imagine the maintenance of the plant handled independently by each division without any supervision or co-ordination on the part of some central authority. Imagine none of the comparisons, conferences, schools, special instruction, &c., which are employed to screw up efficiency gradually to the highest point within an organisation—imagine none of these methods employed in your inland Toll service and you form some picture of the International service. In maintenance such matters as studies leading to decreased cost have to be made and the lessons from these studies have to be applied. Examples are comparisons of faults, the length of time circuits are out of order, the number of times circuits are outside their specified transmission limits. In the Traffic departments the comparisons of Toll observations are important. In all these it is not the adherence to prescribed standards that is so important; it is rather the constant striving after better results assisted by comparisons between divisions which causes progressive efficiency and improvements in service, and this gradual development of technique and efficiency among very large numbers of persons is one of the very difficult jobs for many businesses.

In the absence of all these things which flow so directly from unity of control, something, of course, would be done and service would result; but it would need a miracle to give it the efficiency of a service supervised and controlled by a competent central authority.

We know that not much, if anything, is gained by increasing the size of any organisation beyond a certain extent. But the individual nations of Europe are far too small to form the economical units for this service, and I cannot escape the conclusion that, sooner or later, there will have to be found some single unit for the administration of the European International service, unless, indeed, Europe is to rest content with a service relatively much inferior to the plant which she has provided, and I cannot believe that will be the case.

While the first attack on this problem was concerned with physical matters and lay mainly with the Engineering departments, the development which has taken place has shifted the point of attack, which now lies largely with the Administrative and Traffic departments. To-day the problem seems to apply mostly to business matters.

I want particularly to acknowledge the help I have received from Mr. W. J. Hilyer, in dealing with this subject.

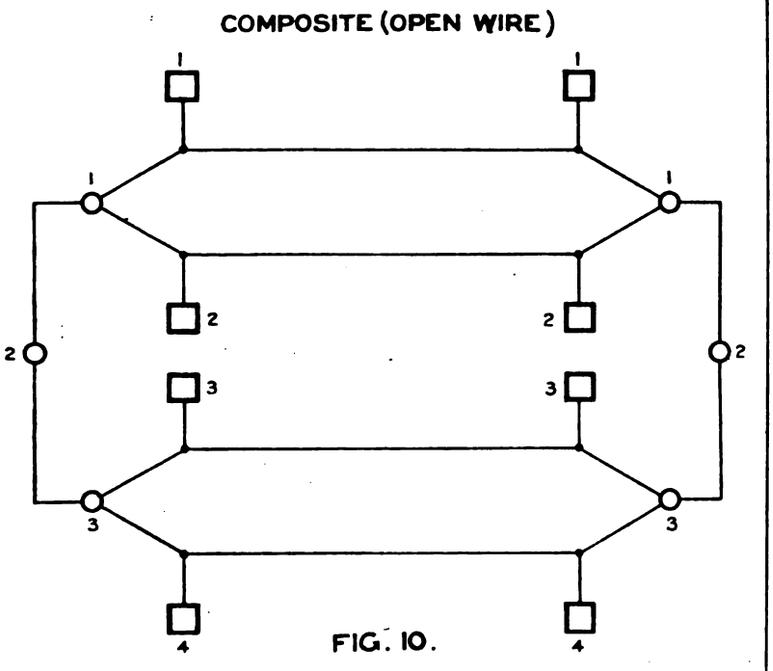

FIG. 10.

Colonel PURVES, in his introductory address, explained that his presence in the Chair was due to the absence of the Society's President, Mr. Stuart Jones, in America, where he was acting as a member of a Commission appointed to study American telegraph methods and practice.

The lecturer needed no introduction to the Society. Mr. Gill's interest in international telephony was well known, and the presence of such a large audience was an indication of his popularity.

An interesting discussion followed the reading of the paper.

Mr. GRANT thanked Mr. Gill for his interesting address and referred to Mr. Gill's outstanding position as a telephone engineer and enthusiast. He commented on Mr. Gill's modesty in not mentioning in his address the great part which he (Mr. Gill) had taken in the formation of the International Consultative Committee which was now functioning so actively and fruitfully in the interests of international telephony. The telephone theory and practice of the British administration coincided so closely with Mr. Gill's own ideas that such criticisms as were contained in the paper could scarcely be regarded as applicable to the Post Office. It was possible, however, that Continental administrations might feel that they had not been given sufficient credit for the rapid developments in international telephony which had taken place during the past few years. The number of services had admittedly been considerably increased and the standard of service had been much improved, especially as regards transmission and delay. The delay figures quoted by Mr. Gill were in some cases out of date. Greater progress still would have been made but for the war.

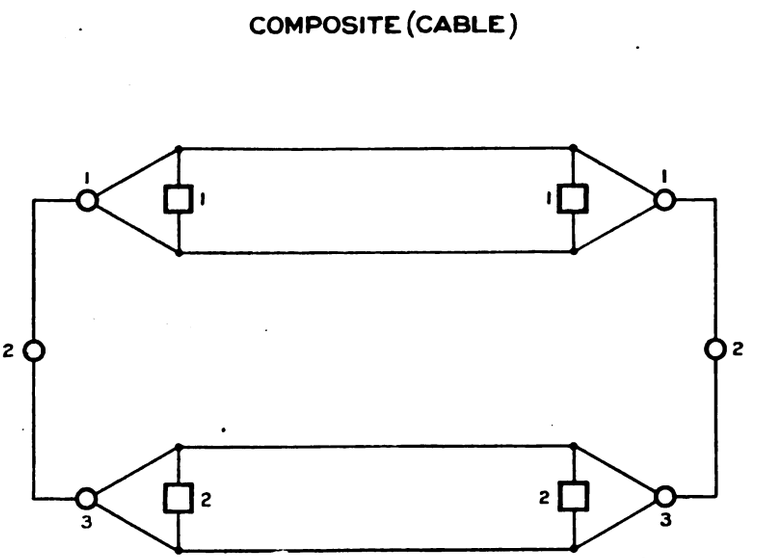

FIG. 11.

The standardisation of service and operating practice presented great difficulties and required careful consideration. In the desire to make progress rapid there was a real risk that low standards might be accepted to meet the requirements of other countries.

Mr. VALENTINE spoke of the thought-provoking and stimulating inaugural address which Mr. Gill gave before the Institute of Electrical Engineers almost six years ago on International Telephony and of its reactions on the minds of men and telephone authorities. He also spoke of Mr. Gill's divine discontent, his plea for further progress in the development of long-distance telephony and of the need for some form of unified control.

Mr. TRAYFOOT considered that the problems of the administrative and traffic staffs in connexion with international telephony were more difficult to deal with than those of the engineering staff. In engineering matters, principles were of very recent origin and were more or less standardised already.

This was not the case in administrative and traffic matters. Each country had services and operating practices of long standing which suited its particular requirements and was reluctant to make changes for the sake of ensuring uniformity. Sub-committees appointed by the C.C.I. are already dealing with the more important matters and some measure of progress is being made. Among other matters a scheme for a person-to-person service had been formulated and was awaiting the concurrence of the various administrations. Regulations for the operation of traffic to and from Stock and Commercial exchanges had been drawn up after the Sub-Committee had studied on the spot the conditions at Stock Exchanges at a number of capital cities, and these were being brought into operation.

Mr. PINK pointed out that in the diagram showing the services existing between the larger cities of Europe and the developments which were possible in this direction, no indication of the community of interest between the various cities was made. In gauging the progress made so far and the future necessities some such information was desirable. He mentioned that in London 70% of the calls regarded in America as Toll calls are connected while the subscriber remains at the telephone, as compared with the American figure of 90 for 1927 mentioned by the lecturer and that it is expected that the London figure will, before many months, be increased to 77%.

He also urged the possibilities of increasing the number of channels by the use of the carrier system on international circuits, particularly for meeting temporary traffic pressure.

Colonel SHREEVE stated that the excellent Toll service which was given in America was in large measure due to the fact that the whole system was under one control. He thought that more use should be made of the facilities afforded by composite circuits.

Mr. HILYER and Mr. DAY also spoke.

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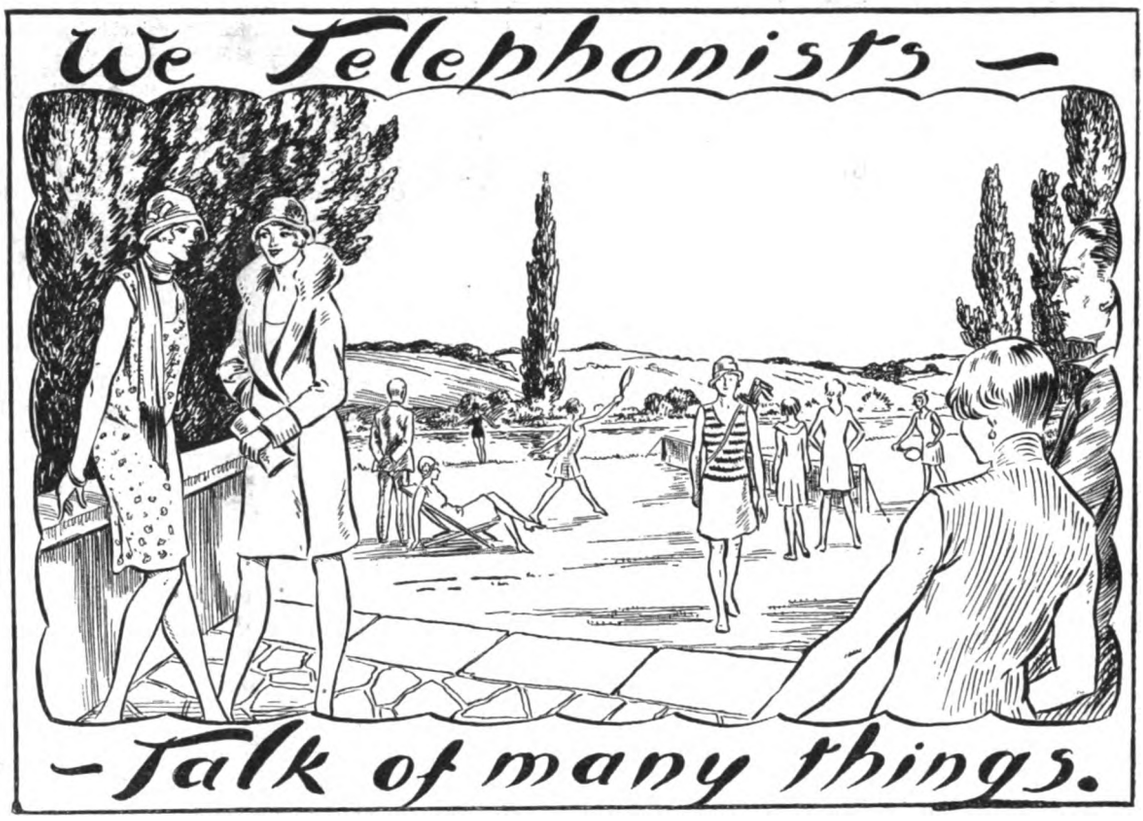

"Heigho, Come to the Fair."

"ONE man in his time plays many parts"—so wrote Shakespeare. Just at present I am a herald. I am not a herald angel—they sing and I should fail in the voice test—nor even a town-crier, with a Bacchic countenance, a large bell and a grater voice. Neither am I a herald of the dawn—I could not rise to that. No, I am one of those picturesque heralds clad in a tabard—the sort of Wireless Uncle they had in mediæval times when there wasn't any wireless, because everybody was wireless. Oyez—I mean, oh yes, that's the sort I am—charged all proper with halidoms and quantities of bodikins (gules and or) and withal extremely vert. And I have just blown a blast on my trumpet, which is another way of saying, "Friends, Romans, Countrymen, Lend me your ears."

Very well then, "Unto all whom it may concern, Greeting." I want to tell you about the Christmas Fair which is being organised with the object of endowing a bed in the Elizabeth Garrett Anderson Hospital for Women. Now it's not a bit of use you saying that you know all about it because you don't, and even if you do, it won't stop me, now that I've started. The Fair is being held, very appropriately, in the Memorial Hall, Farringdon Street, on Friday and Saturday, Dec. 7 and 8, 1928. It opens at 3 p.m. on Friday and at 2 p.m. on Saturday. The price of admission is hardly worth mentioning, but, as a matter of passing interest, I may say that from 2 p.m. to 5 p.m. on Friday, the charge is 1*s.*, and that thereafter, and all day on Saturday, 6*d.* will see you safely in. The cost of getting out again is left entirely to you, but I understand that the organising committee would be tickled to death if you had to walk home each day.

Once inside the Fair you will find a remarkable range of goods for sale. Each Traffic District as well as F.E.S. and the School has its own stall, and the merchandise of each varies as follows:—

East District	...	China (naturally from the East) and glass.
E.C. „	...	Leather goods (even the unsoled must be sold).
N.W. „	...	Household goods (mousetraps! Well, may be!)
South „	...	Haberdashery (ribbons and—er—sew on).
Trunk „	...	Toys (elephants, of course—Trunks you know).
West „	...	Refreshments (East is East but West is Best).
W.C. „	...	Household linen (for Bride and Bridget).
School „	...	Sweets (sugarstick, but not lipstick).
F.E.S. „	...	Christmas gifts (with possibly an odd promotion or a P. 18).

In addition there is to be a Christmas Tree, a real Gold Mine, Houpla, and Fortune Telling. Continuous Dramatic Performances and Concerts will also be provided.

It needs no words of mine to commend the Christmas Fair—the worthiness of the cause is sufficient. The Hospital was founded in 1866 and is run exclusively by and for women. It was, I believe, the first of its kind. During the three years 1925 to 1927 over 26,000 patients received treatment, but lack of money has necessitated a drastic curtailment of its activities. A relatively large sum of money is needed to endow a bed, but "We Telephonists" (with the help of male and female colleagues) can easily secure the necessary amount. The needs of the Hospital are a challenge to women. Having launched the Christmas Fair, let us all support it to the utmost of our ability. Every penny spent at the Fair on Dec. 7 and 8 will help to relieve the distress of a fellow creature. Money saved up to Dec. 6 will help to save lives after Dec. 8.

Well, good-bye—don't be late—meet you under the clock.

PERCY FLAGE.

City of Laughter, City of Tears.

November is probably one of the dreariest months of the year, but it has two outstanding events, which take away from its monotony, and combine all the elements of humour and pathos.

Please to remember the 5th of November,
The Gunpowder Treason and plot;
For I see no reason, why gunpowder treason,
Should ever be forgot.

Who does not feel a thrill at the words of the old rhyme, and how one's memory goes back to the days of childhood; to the huge bonfire, and the crackers; the Roman candles, and the sky-rockets. Better still, if one has nephews or nieces, who cannot still join with zest in holding "sparklers" and "coloured lights" or feel thrilled when a "chrysanthemum" or "coloured flower pot" bursts into flame! It is very amusing to see all the different "Guys" that are wheeled about the streets, and even though the collectors are somewhat too pressing at times, such a remark as "Just a farthing for luck, lady!" is not without its humour.

But life does not consist of fun, as we all know, and the next Celebration which takes place is a very solemn one, and one which touches the hearts of all. Armistice Day! What memories it brings back! To some these are more poignant, but to all they are full of sadness, howbeit of triumph. It gives us fresh inspiration to go forward, and fresh courage, and the realisation of how short a time even the longest life is in the light of eternity.

Hope on, brave heart, although the pathway darken;
Pray on, oh soul, amid the busy strife.
Earth is not all, His Angels ever hearken,
Heaven shall make perfect our imperfect life.

L. R.

The latest from the North.

Two taxi-cabs collided in Aberdeen, and 41 passengers were injured.

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London Telephonists' Society: First Meeting of Session.

The Moon was shining valiantly,
Shining with all its might.
It did its very best to make
The streets look clean and bright,
Nor was this odd, because, you see,
It was a Friday night.

The cups were chinking cheerily,
The vestibule was packed.
In all that crowd, no head was bowed,
No soul two biscuits lacked—
The simple tea, in short, was free,
Through Presidential tact.

The Chairman and the President
Were sitting near at hand.
They smiled like anything to see
Of girls so large a band.
"If we from each can get a speech"
They said, "it will be *grand*."

"The male staff, too," the Chairman said,
"Are very largely here.
"Do you suppose, from some of those,
"*Much* talent will appear?"
"I doubt it," said the President,
And shed a bitter tear.

"I weep for you," the Chairman said,
"And deeply sympathise.
"But when your task is done, I'll ask,
"Myself, if they will rise."
The President said nothing but
"I fear you're hardly wise."

His speech was made, but none essayed,
To break that silence vast.
No voice was heard, no sound, no word—
The Chairman sat aghast.
"I told you so," the President
Said with a smile at last.

"The time has come," the Chairman cried,
"To talk of many things,
"Of, 'Something to look forward to'
"And whether words have stings.
"Of television, talkie films,
"Of Presidents—and Kings."

"Oh, audience, please talk to us,"
The Chairman did beseech.
"Express your views just how you choose,
"Rush boldly to the breach.
"Announce your name, win lasting fame;
"A speech, a speech, a speech."

At last a speaker bold arose,
With well-turned phrase and neat,
Called, in effect, the President
A name I won't repeat—
And, later, was to wish, in vain,
He had *not* gained his feet.

And soon another one stood up;
And more and more and more,
Some flatly contradicting all
That had been said before,
Or giving reminiscences
From childhood's happy store.

The Chairman (as the President
Replied, unvanquish-ed,
With Puckish smile, though free from guile),
Was seen to shake her head,
Yet could not hide a certain pride,
At what he gaily said.

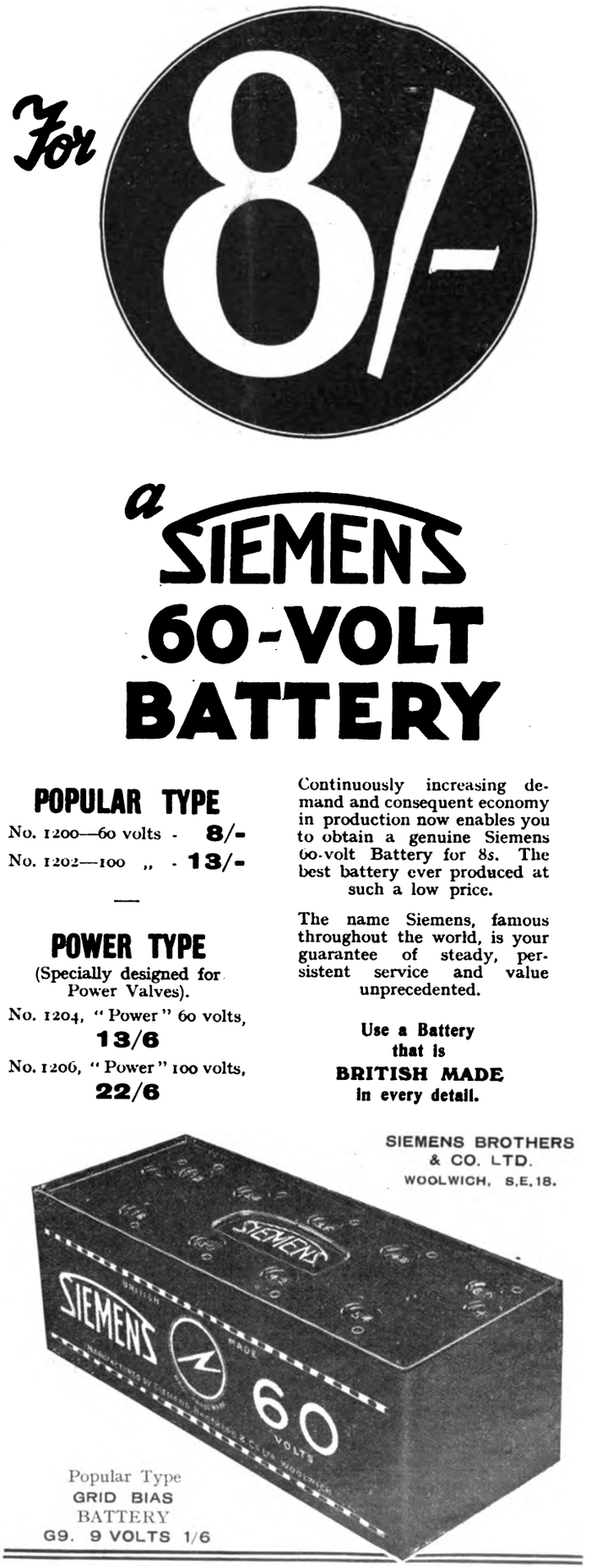
"Oh, audience," the Chairman smiled,
"The President has done;
"Has someone something else to say,"
But answer came there none,
Which wasn't odd, because you see,
He'd stymied every one!

Mountview Swimming Club.

The first gala of the Mountview Amateur Swimming Club was successfully held on Tuesday, Oct. 9, at the Hornsey Road Baths.

A large and enthusiastic audience witnessed the various displays and races by the seemingly untiring competitors.

The nightdress and costume races were the cause of much fun and laughter, while the obstacle race held everyone at "high tension" as to who would overcome the elusive tin-can. The polo match, ornamental



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swimming display, and exhibition diving by the A.D.A. team, were three features which were highly applauded.

The club championships were won by Miss Burrett (100 yds.) and Miss Spicer (50 yards).

Miss Tringham kindly presented the cups and prizes to the various winners, and gifts to the helpers and organiser of the gala. Then, amidst loud applause, the club champion presented Miss Tringham with a bouquet of carnations, but owing to the lateness of the hour all conventional speeches were abandoned.

Thus concluded a very enjoyable evening, which it is hoped will only be one of many. F. I. A. N.

Contributions to this column should be addressed THE EDITRESS, "Talk of Many Things," *Telegraph and Telephone Journal*, Secretary's Office, G.P.O. (North), London, E.C.1.

GLASGOW TELEPHONE NOTES.

ON Friday, Oct. 12, there was a happy gathering in the Glasgow Traffic Office to make a presentation to Mr. J. J. O'Rourke, Assistant Traffic Superintendent, on the occasion of his marriage. The gifts consisted of a fine overmantel and an electric iron, and were presented on behalf of the staff by Mr. A. E. Coombs. Mr. E. J. Johnson and Mr. A. E. Higgins also spoke and Mr. O'Rourke responded in his usual happy manner.

So Mr. J. G. Mackay, Assistant Traffic Superintendent, has at last severed his official connexion with us. With the exception of two days in August, John has been on sick leave since July, 1926. We all trust that in his retirement he will recover and maintain his health for many years to come.

A "Turner" for a Penny.

I boarded a Dennistoun-bound tram at Queen Street Station and procured a seat at the back, outside. "A penny one, please!"

And as I looked westward my penny rapidly grew with compound interest to hundreds of pounds, for as the car sped on I beheld a beautiful picture. The November sun was sinking in a blaze of red and gold behind a vista of domes and spires that stood out against the sky; and as the grey evening mist crept up and distance gave me a longer perspective, I seemed to visualise the kind of scene which Turner must have enjoyed so often and has portrayed so wonderfully.

I felt that my "pennyworth" had helped to give me an appreciation and a better understanding of the great artist's work.

M. L. TULLOCH.

A Toast.

"THE LADIES."

A toast like this
No man must miss,
For it were bliss
The cup to kiss—
It were remiss
The Miss to kiss,
And cup to miss—
To miss the kiss
Of cup or Miss
Would mar the bliss
Of toast like this!

M. L. TULLOCH.

On Mistakes.

"The supreme ideal is the worthy attainment of a reputation for infallible accuracy. The possession of an active intelligence would rid the Office of its greatest curse—the mistake."—*National Telephone Journal.*

"The Post Office does not adopt an attitude of infallibility."—P.O. Circular.

"I learned in my early days that the great thing about the Post Office Service was *to get things done*, even though they might not be done in the best style and with the greatest accuracy. Then I learned that you must cultivate style and accuracy."—L. T. Horne.

"No bricklayer builds a wall perfectly perpendicular, mathematically this is not possible; a certain degree of perpendicularity suffices him; and he, like a good bricklayer, *who must have done with his job*, leaves it so. And yet if he sway too much from the perpendicular, he and his wall will rush down into confused welter of ruin."—Carlyle.

"It is not easy to be exact; it is easier, alas! to be inexact. It is by careful method and minute, unwearying attention that men rise even to material exactness even of external and constant things."—R. L. S.

"There are a hundred ways of going wrong, but only one of going right."—G. K. Chesterton.

"In view of the number of errors shown to be possible one wonders not why there are so many discrepancies but why there is so much accuracy."—G. F. Bateman.

"Protect me from the man who never made a mistake."—Senator Beveridge.

"The only people, scientific or otherwise, who never make mistakes, are those who do nothing."—Huxley.

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Mr. H. Murray and Mr. E. Wright represented the District Manager and Staff at the funeral, which took place on Oct 16.

J. L.

NEWCASTLE TELEPHONE NOTES.

The Exchange Swimming Club, which was formed this season, held its first Annual Gala on the evening of Oct. 5, and was pronounced a huge success

It would have been strange indeed if success had not rewarded the hard work put in by the Club Committee, together with the enthusiasm and support which the venture received from the officials and staff of the exchanges and District Manager's office, to whom the thanks of the Club members and the delighted Gala audience are due.

If at times the bath's premises rocked on their foundations with the force of the full-throated exhortations to "Come on, Central!" "Stick it, Trunks!" "Buck up, Billee!" &c., &c., causing the District Manager, Mr. J. D. W. Stewart, in his presidential address, to express the opinion that some members of the audience should do well in a plunging competition, judging by their power of lung—it was only a further evidence of enthusiasm and augured well for future support.

The humorous interlude afforded by the life-saving display which took a most novel form included a jilted lover, followed by a sensational attempt at suicide and a subsequent forced rescue by the repentant lover, and a very human episode of a "couple o' kids" playing boats, the inevitable falling in of one and plucky rescue by the other (all in full dress) was deservedly well received.

The Club trophies—a silver shield for the Club Championship and a silver cup for graceful swimming, were won by Miss Alice Beattie and Miss Rita Farquharson, who hold them for one year. The Club handicap was won by Miss Millie Routledge.

A social is to be held later at which prizes for other events are to presented by Miss E. M. Holt—Supervisor of the Trunk Exchange. J. H. W.

The first Telephone Staff Dance of the season is being held in the Heaton Assembly Rooms on Nov. 9.

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THE

Telegraph and Telephone Journal.

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TELEGRAPH AND TELEPHONE MEN AND WOMEN.

LIX.—
COMMANDER E. L. C. GRATTAN.

[*Photo by J. Russell & Sons, Baker Street.*

WHEN Mr. Wadley retired from the post of Assistant Controller (Foreign) in the Central Telegraph Office last September he was succeeded by Commander E. L. C. Grattan, D.S.O., late of the Royal Navy. It seems a long cry from the sea to the Cable Room. He started his career on the sea, and he is now grappling with the conditions under it and over it. Under it by cables, and over it by wireless. And his qualifications are eminently suited to all three.

Commander Grattan was born in Ireland in 1884 and entered the Navy in 1899, but even then he was not satisfied with the surface of the sea as in 1896 he became an officer in the Submarine Service. He survived, and we find him at the outbreak of war in a wireless appointment at the Admiralty, with the rank of Lieutenant Commander. In 1916 he was on wireless work in the Mediterranean, and at Gallipoli was twice mentioned in despatches and awarded the D.S.O. Two years later he returned to the Admiralty, with the rank of Acting Commander, and was put in charge of the Naval Shore Wireless and Signal stations in this country.

He retired from the Navy in 1921 and was appointed Assistant Inspector of Wireless Telegraphy in the Post Office. After three years at Headquarters he proceeded to Egypt to take charge of the Post Office wireless station at Abu Zabal. Meanwhile the beam wireless services had been opened, necessitating an increase in the Cable Room staff, and Commander Grattan was appointed Superintendent, Higher Grade, on the Cable Room staff at the beginning of this year, and was promoted to Asst. Controller in September.

Commander Grattan, since his arrival in the Cable Room, has naturally been specially concerned with the development of the beam wireless services, but as we do not know his views on the new merger scheme, we cannot publish them, and perhaps it is just as well. But merger or no merger, we all join in wishing our new Assistant Controller every success in the future, which we can indeed confidently predict from his attainments in the past.

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swimming display, and exhibition diving by the A.D.A. team, were three features which were highly applauded.

The club championships were won by Miss Burrett (100 yds.) and Miss Spicer (50 yards).

Miss Tringham kindly presented the cups and prizes to the various winners, and gifts to the helpers and organiser of the gala. Then, amidst loud applause, the club champion presented Miss Tringham with a bouquet of carnations, but owing to the lateness of the hour all conventional speeches were abandoned.

Thus concluded a very enjoyable evening, which it is hoped will only be one of many. F. I. A. N.

Contributions to this column should be addressed THE EDITRESS, "Talk of Many Things," *Telegraph and Telephone Journal*, Secretary's Office, G.P.O. (North), London, E.C.1.

GLASGOW TELEPHONE NOTES.

ON Friday, Oct. 12, there was a happy gathering in the Glasgow Traffic Office to make a presentation to Mr. J. J. O'Rourke, Assistant Traffic Superintendent, on the occasion of his marriage. The gifts consisted of a fine overmantel and an electric iron, and were presented on behalf of the staff by Mr. A. E. Coombs. Mr. E. J. Johnson and Mr. A. E. Higgins also spoke and Mr. O'Rourke responded in his usual happy manner.

So Mr. J. G. Mackay, Assistant Traffic Superintendent, has at last severed his official connexion with us. With the exception of two days in August, John has been on sick leave since July, 1926. We all trust that in his retirement he will recover and maintain his health for many years to come.

A "Turner" for a Penny.

I boarded a Dennistoun-bound tram at Queen Street Station and procured a seat at the back, outside. "A penny one, please!"

And as I looked westward my penny rapidly grew with compound interest to hundreds of pounds, for as the car sped on I beheld a beautiful picture. The November sun was sinking in a blaze of red and gold behind a vista of domes and spires that stood out against the sky; and as the grey evening mist crept up and distance gave me a longer perspective, I seemed to visualise the kind of scene which Turner must have enjoyed so often and has portrayed so wonderfully.

I felt that my "pennyworth" had helped to give me an appreciation and a better understanding of the great artist's work.

M. L. TULLOCH.

A Toast.

"THE LADIES."

A toast like this
No man must miss,
For it were bliss
The cup to kiss—
It were remiss
The Miss to kiss,
And cup to miss—
To miss the kiss
Of cup or Miss
Would mar the bliss
Of toast like this!

M. L. TULLOCH.

On Mistakes.

"The supreme ideal is the worthy attainment of a reputation for infallible accuracy. The possession of an active intelligence would rid the Office of its greatest curse—the mistake."—*National Telephone Journal.*

"The Post Office does not adopt an attitude of infallibility."—P.O. Circular.

"I learned in my early days that the great thing about the Post Office Service was *to get things done*, even though they might not be done in the best style and with the greatest accuracy. Then I learned that you must cultivate style and accuracy."—L. T. Horne.

"No bricklayer builds a wall perfectly perpendicular, mathematically this is not possible; a certain degree of perpendicularity suffices him; and he, like a good bricklayer, *who must have done with his job*, leaves it so. And yet if he sway too much from the perpendicular, he and his wall will rush down into confused welter of ruin."—Carlyle.

"It is not easy to be exact; it is easier, alas! to be inexact. It is by careful method and minute, unwearying attention that men rise even to material exactness even of external and constant things."—R. L. S.

"There are a hundred ways of going wrong, but only one of going right."—G. K. Chesterton.

"In view of the number of errors shown to be possible one wonders not why there are so many discrepancies but why there is so much accuracy."—G. F. Bateman.

"Protect me from the man who never made a mistake."—Senator Beveridge.

"The only people, scientific or otherwise, who never make mistakes, are those who do nothing."—Huxley.

"The man who never makes any blunders will never rise in the esteem of the world above the reputashun of a guide-board."—Josh. Billings.

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The first Ten Assembly Rooms on N

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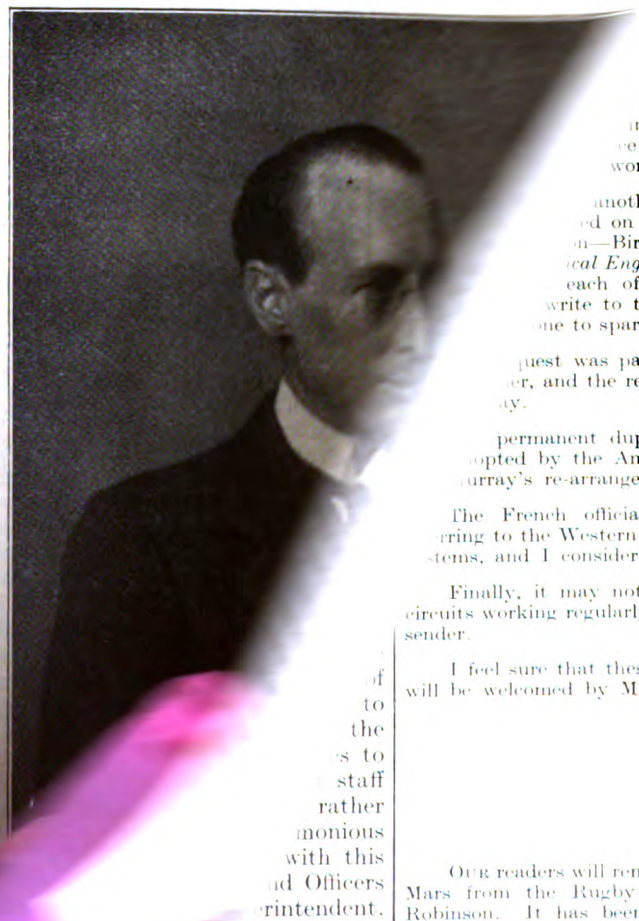
TELEGRAPH AND TELEPHONE MEN AND [illegible]

LIX.—
COMMANDER E. L. C. GRATTAN.



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[illegible]ne. Its [illegible]ction in not only generally. [illegible]he working [illegible]changes are has derived

[illegible]e given during waste in all its [illegible]nal discussion of [illegible]g information, on [illegible]n, are points which

[illegible]ENCE.

MULTIPLEX.

[illegible]PH AND TELEPHONE JOURNAL."

[illegible] interesting paper given by Mr. Stuart [illegible]ng of the T. & T. Society, a statement [illegible]nnel multiplex was "the pioneer of the [illegible]nent is not correct and I feel sure that [illegible]he correction. According to information [illegible]umayrou, the then Controller of the C.T.O. [illegible]tter and keyboard perforator was designed [illegible]e one I saw in use at Paris in 1906, working was constructed by Monsieur Carpentier, of

[illegible]it to Paris in 1906 authority was obtained for [illegible]ch arrived in London in 1907 and was shown to [illegible]s, with the result that he abandoned his perforator, [illegible]an inch per letter and was used on his high-speed [illegible]adopted the method of cross perforations with a [illegible]nch per letter, as in the French instrument. To the [illegible]e must be given the honour of being the pioneers in [illegible]working.

[illegible]another statement that the Americans produced a system [illegible]d on Mr. Murray's, I would like to add that the results [illegible]n—Birmingham quadruple duplex Baudot were published [illegible]*cal Engineers' Journal* in January, 1911, of 50 to 70 messages [illegible]each of the eight channels. This induced the American [illegible]write to the British Post Office for some Baudot apparatus, [illegible]one to spare and at that time we did not construct it.

[illegible]quest was passed to Messrs. Elliott Bros., who were the agents [illegible]er, and the requisite Baudot apparatus was obtained for America [illegible]ay.

[illegible] permanent duplex arrangement devised by the British P.O. was [illegible]opted by the Americans as well as by Mr. Murray. They adopted [illegible]urray's re-arrangement of the Baudot code.

The French officials use the term "Anglo-American Baudots" in [illegible]rring to the Western Electric, Murray, Western Union or other multiplex [illegible]stems, and I consider that they are correct.

Finally, it may not be generally known that there are many Baudot circuits working regularly at 35 words a minute with the 5-key Baudot hand sender.

I feel sure that these three small corrections to such an excellent paper will be welcomed by Mr. Stuart Jones.

Yours faithfully,

A. C. B.

OUR readers will remember that the Post Office sent a written message to Mars from the Rugby Station at the urgent request of Dr. Marstield Robinson. It has been suggested that the Martians, being careful folk, did not reply because the message was not sent "reply paid."

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NO-DELAY BASIS TRUNK AND JUNCTION SERVICES.

RECOVERING THE WASTE.

BY C. W. DAVIES, *Assistant Traffic Superintendent, Bristol.*

A SPEEDY means of communication at all times between one exchange and another is one of the aims of an ideal telephone service. Within recent years considerable development in this direction has been effected, so that it is now possible to obtain a no-delay basis service to exchanges within a wide area about any given exchange. Indeed, so rapid has been this development that the majority of the junction and trunk circuits at present in use are operated on a no-delay system.

Unfortunately, the words "ideal" and "no-delay" bear little compatability with such words as "financial considerations," but both bring considerable pressure to bear in considering the adequacy or otherwise of any group of circuits. Briefly, the relation is this:—

Financial considerations impose definite limitations to the number of circuits which will economically carry any given volume of traffic without congestion; and, in order that these limitations shall not exert an adverse effect on the standard of service afforded by any group of circuits, steps must be taken to see that the group is worked to its fullest revenue-earning capacity.

Experience shows that this capacity is not always reached; with the result that calls, and hence potential revenue, are either lost or deferred, and additional expenditure incurred in operating complications and in dealing with dissatisfied subscribers' complaints. Clearly, the chief reason for this loss is due to waste time on circuits; any recovery of which is satisfactory to all parties.

The main sources of this waste time are these:—

(*a*) Maintenance Defects.
(*b*) Delays in Answering and Clearing.
(*c*) Inaccurate Timing of Calls.
(*d*) Miscellaneous Sources, i.e. Circuits Engaged, No Reply, &c.

Maintenance Defects.—Wherever an exposed overhead pole-line exists, there will occur a large percentage of the faults on the circuits it carries. Certain it is that the majority of stoppages on trunk and junction circuits are attributable to this defect. There is no doubt that all associated with the Trunk Service fully realise this and make due allowance for the fact that the English climate does not conduce to uninterrupted service on circuits constructed throughout all or part of their routes by overhead wires in exposed positions. Even after this factor has been taken into consideration, however, it would appear, to one not fully conversant with the administration of maintenance staffs, that there is still room for improvement in reducing delays in clearing faults and in preventing the recurrence of faults day after day. In addition to any saving which might be effected in the treatment of actual faults, a reduction in the number and duration of the stoppages occasioned by men working on routes carrying working lines would undoubtedly be of assistance in increasing the revenue-earning capacity and in reducing the maintenance charges of the circuits concerned. A considerable amount of lost time emanates from this source, and to augment this loss further expense is sometimes incurred in sending linemen to attend to faults brought on by a gang. An engineering officer is clearly the man who could throw further light on this aspect of the case, but assistance can be rendered by the operating staff. It is here that the system of routine testing, properly applied, will bring forth fruitful results. A report of every defect thus discovered, even though it may not be so serious as to stop the service on the route concerned, would tend towards improved maintenance conditions. It might happen, of course, that there would be an increase in the number of faults reported on the more exposed routes, but once the route has been put into a proper state of service, these should diminish. Early morning routine tests are essential so that the Engineering Department may be enabled to give the earliest attention.

Delays in Answering and Clearing.—The detection of delays in answering and clearing calls is frequently a difficult problem. Very often such delays are not brought to notice until the calls in question have been completed, and by the time enquiry can be made most of the facts have been forgotten.

In the Service Inspector's Tests, there is a column "B" "Telephonist Answered." In this column is entered the speed of answer of the telephonist at the first exchange after the originating exchange through which the call is circulated. A speed of answer of 5 seconds is aimed at on "A" calls. As similar operating conditions obtain on jack-ended "B" circuits, there is every reason to assume that the same objective should be attainable on incoming junction calls. Allowing for the application of the "Engaged" test and the selection of the junction at the originating exchange, an average figure of 8 seconds in the "B Telephonist answered" column would not be unreasonable.

For the past six months it has been the practice in the Bristol District to summarise these figures and pursue the results with the exchanges concerned. In consequence, it has been possible, at four fairly important junction centres, to reduce the average speed of answer on jack-ended "B" calls from 19 seconds to 10 seconds. This difference of 9 seconds represents a saving of 0.15 minutes average holding time per call. Although this reduction may appear to be slight, a scrutiny of the Standard Junction Loads will show that no small increase in efficiency has been achieved. This saving will be more readily appreciable when the effect on say a month's traffic is considered. Two of the exchanges handle approximately 1,000 incoming calls daily.

It might be argued that representative results are not easily obtainable from Service Tests when only 6 months' figures are considered. I must admit that there is some truth in this. It is difficult to say what number of tests will give representative operating data, probably no fewer than 500. Herein the above statements are open to question. The number of test calls on which the cases have been pursued is nothing like so many as 500. This view does not affect the principle of the scheme, however, and even though only a few tests may be available for consideration, their pursuance at the time with the staff concerned should tend towards improved service.

Engineering facilities have rendered junction working so rapid as to reduce delays in clearing to negligible proportions. Automatic signalling exists on practically every no-delay basis junction and trunk route, and the improved operating conditions afforded by it give little ground for repeated failures to clear circuits promptly. Difficulties are however encountered when subscribers connected to magneto exchanges fail to ring off at the termination of calls. Magneto systems still figure prominently in the Bristol District, and increased holding time on junctions occasioned by delays in clearing them has been found to be due, in the main, to this defect. At one time the irregularity obstructed the working of the Bath—Bristol local trunks to such an extent as to be a real source of trouble. The subscribers giving the greatest offence were approached and improvements were thereby effected. The matter is, however, one which requires constant attention. Periodic records at the exchanges where the irregularity is most apparent furnish reliable data in deciding the most profitable course of action. A personal visit or conversation by telephone with subscribers will usually rectify any irregularity on their part.

Timing of Calls.—Whatever waste may be debited to subscribers' irregularities, that incurred by the Department itself may easily reach immense proportions unless a close watch on the activities of its officers is kept. In this respect the efficiency of the Junction

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and Trunk Service is liable to no small detriment; especially at exchanges where Service Observation facilities do not exist.

Subscribers are given to understand that their junction and trunk fees are assessed on the basis of 3 minutes conversation. While it is possible to allow a little latitude on the shorter distance calls during the quieter periods of the day, the Department is fully justified in strictly imposing the 3-minute limit during the busy hours. When we consider that a latitude of 1 minute per call during the busy hour reduces the efficiency of a group of circuits by 25%, and that the revenue accrued during that period is only 75% of that available, the necessity for accurate timing becomes a matter of considerable importance. Further, the delay thus occasioned to other subscribers' calls cannot be ignored.

Service Observation Records, Service Inspectors' Tests, T 45 records, and reports from officers in charge of exchanges, are all sources whereby the state of a route can be judged. Detailed records of the effective and ineffective traffic passing over each apparently congested route are necessary. From these the source of the delay can be discovered. It frequently happens that a number of delayed calls are registered during a period when the actual effective traffic does not come within a reasonable approximation of the load which the route in question is capable of carrying without congestion. These cases constitute waste holding time; some, if not all, of which may be reclaimed by drawing the attention of the staff concerned to the immediate necessity for strict timing and supervision on all calls. It must be admitted that in combined exchanges the standard of accuracy reached may not equal that attained in Trunk Exchanges. Less elaborate timing devices and the necessity for dealing with local and other miscellaneous classes of traffic preclude the possibility of strict accuracy being enforced at all times.

In order that the system may be productive of fruitful results, however, frequent traffic records are essential and any necessary attention should be given without delay. The T 45 form is clearly the main incentive towards subsequent action.

This aspect of the service has been pursued fairly intensively in Bristol, so that it has been possible, in respect of considerably more than 50% of the congested routes, to reduce delays by imposing stricter supervisory measures; thereby increasing the efficiency of the groups of circuits concerned and deferring the provision of additional facilities until such time as increased traffic makes closer supervision abortive.

Miscellaneous Sources.—The excellent articles by Mr. E. J. Johnson in the April issue of the *T. & T. Journal*, and "W. F. T.," in the issue of the following month, treat so thoroughly on the elimination of wastage through "No Reply," "Number Engaged," and other miscellaneous sources, that any attempts to enlarge on their remarks would amount to grave impertinences. The application of the system outlined in those articles would tend greatly towards the elimination of the use of the junction and trunk service for calls which cannot mature by reason of inability to get the wanted subscribers.

What method of ensuring the permanency of any improvement, effected by the pursuance of the courses described above, will be productive of the best results? The operating staff, in the performance of their duty, are working some thousands of pounds' worth of plant, attached to which is other expense, in the shape of maintenance and operating costs, which is by no means insignificant. Some means of impressing upon them the fact that the defrayment of this expense is dependent, in part, on the degree of efficiency to which the apparatus is worked, is desirable. It is certain that the system of treating all cases in official correspondence requires to be assisted in some manner. There is a tendency amongst staff generally to look upon a set of official papers as a rebuke rather than a constructive criticism or suggestion. To ensure harmonious working the destruction of this idea is essential; and, with this end in view, periodic meetings of Supervising Officers and Officers in Charge of Exchanges, presided over by the Traffic Superintendent, are recommended.

This practice has been followed in Bristol for some time. Its influence, judged by the Service Test Records and reduction in subscribers' complaints, has apparently been beneficial, not only to the junction and trunk service, but to the Service generally. The officers have been given an opportunity of seeing the working of the larger exchanges in the District, and as larger exchanges are usually big junction centres, the no-delay service has derived considerable benefit.

Consideration of the Service generally can be given during such meetings; and the possibility of recovering waste in all its branches reviewed. The opportunities for informal discussion of operating procedure generally and for collecting information, on which can be based data for any necessary action, are points which should not be lost sight of.

CORRESPONDENCE.

THE AUTOMATIC MULTIPLEX.

TO THE EDITOR OF "THE TELEGRAPH AND TELEPHONE JOURNAL."

Dear Sir,—In that excellent and interesting paper given by Mr. Stuart Jones, on Nov. 19 last, at the meeting of the T. & T. Society, a statement was made that the Murray four-channel multiplex was "the pioneer of the automatic multiplex." This statement is not correct and I feel sure that Mr. Stuart Jones will welcome the correction. According to information given me in 1906 by Monsieur Doumayrou, the then Controller of the C.T.O. at Paris, the automatic transmitter and keyboard perforator was designed in France in the year 1887. The one I saw in use at Paris in 1906, working on a quadruple simplex set was constructed by Monsieur Carpentier, of Paris, in 1903.

As a result of that visit to Paris in 1906 authority was obtained for the purchase of a set, which arrived in London in 1907 and was shown to Mr. Murray soon afterwards, with the result that he abandoned his perforator, which had a feed of half an inch per letter and was used on his high-speed automatic system, and adopted the method of cross perforations with a feed of one-tenth of an inch per letter, as in the French instrument. To the French telegraph service must be given the honour of being the pioneers in automatic multiplex working.

With regard to another statement that the Americans produced a system fundamentally based on Mr. Murray's, I would like to add that the results of the first London—Birmingham quadruple duplex Baudot were published in the *P.O. Electrical Engineers' Journal* in January, 1911, of 50 to 70 messages in an hour on each of the eight channels. This induced the American authorities to write to the British Post Office for some Baudot apparatus, but we had none to spare and at that time we did not construct it.

The request was passed to Messrs. Elliott Bros., who were the agents of Carpentier, and the requisite Baudot apparatus was obtained for America in that way.

The permanent duplex arrangement devised by the British P.O. was also adopted by the Americans as well as by Mr. Murray. They adopted Mr. Murray's re-arrangement of the Baudot code.

The French officials use the term "Anglo-American Baudots" in referring to the Western Electric, Murray, Western Union or other multiplex systems, and I consider that they are correct.

Finally, it may not be generally known that there are many Baudot circuits working regularly at 35 words a minute with the 5-key Baudot hand sender.

I feel sure that these three small corrections to such an excellent paper will be welcomed by Mr. Stuart Jones.

Yours faithfully,

A. C. B.

OUR readers will remember that the Post Office sent a written message to Mars from the Rugby Station at the urgent request of Dr. Marstield Robinson. It has been suggested that the Martians, being careful folk, did not reply because the message was not sent "reply paid."

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TELEGRAPHIC MEMORABILIA.

A MERRY CHRISTMAS AND A HAPPY NEW YEAR TO ALL.

AUSTRALIA.—Mr. William Gibson (Commonwealth Postmaster-General), describing the development of the Australian postal, telegraph, and telephone services in recent years, claimed that the charges were as low as in any country in the world. If Australia had charged the Canadian telephone rates the profit would have been £2,500,000, if the United States rates £2,000,000, British rates £1,600,000, and New Zealand rates £1,000,000. In the last six years £24,300,000 had been made available for capital expenditure, yet the Department had paid its way after providing annually for interest £1,100,000, depreciation £630,000, and superannuation £288,000. Australia, Mr. Gibson said, was now the sixth country in the world with regard to telephone development per head of the population. The completion of the Perth-Adelaide circuit would render possible the longest telephone connexion in the British Empire, namely, 5,000 miles, from Perth, Western Australia, to Cairns, North Queensland.

Probably within a year a wireless telephone system, costing £45,000, will be in operation between London and Melbourne, says the *Sydney Morning Herald*. The Postmaster-General (Mr. Gibson), who made this announcement in the House of Representatives, also stated that at an early date it was hoped to establish a wireless-telephone service between Tasmania and the mainland, and to provide a metallic telephone circuit between Adelaide and Perth. Inquiries were proceeding, he said, to determine the possibility of introducing wireless-telephony services to replace trunk-line services over long distances in Australia, so that the heavy cost of erecting thousands of miles of wire might be avoided.

A Sydney correspondent of *World Radio* reports that a scheme is being worked out between the New South Wales Broadcasting Co., Australia, and the National Broadcasting Co. of America for an interchange of programmes on a basis new in the history of radio. The idea is for each station to broadcast items alternately, each taking the other's items and rebroadcasting them in between. Each station would transmit on two wavelengths: the ordinary wave used for local broadcasting and a special short wave for long-distance work.

BELGIUM.—It has been resolved by the Cabinet to reconstitute the country's telegraph and telephone systems as an independent department, with its own budget, and power, subject to the Government's sanction, to float loans. The new body will take over from the old administration accounts and funds representing the sum of about £30,000,000. Up to 1933 the State will furnish it with the moneys necessary, not to exceed £1,500,000 a year, for extending the field of operations. From and after the year 1933 the department will be expected to pay its way and to hand over to the State 5% interest on the total amount expended by it since the formation of the department. Included in the Government programme is the establishment of insurance and reserve funds. All surplus reserve funds over and above £1,000,000 are to be paid over to the State.

Paul Delandsheere, the Brussels correspondent of the London *Daily Telegraph*, says that Baron Tibbaut, who is President of the Belgian Parliament, "has decided to introduce wireless for the management of the Parliamentary debates. A microphone has just been installed on the President's rostrum, and is connected with two loudspeakers fixed between the colonnades of the hemicycle.

Thus the President will be able to make himself clearly heard when otherwise his voice might run the risk of being lost amidst the tumult of the Assembly. If the Opposition should then attempt to drown his words by their clamour, the loudspeakers, dominating the vociferations of the organisers of uproar, would still enable the President to express himself with authority. . . . On the eve of the reopening of a session which threatens to be a very stormy one, as it will serve as a prelude to the electoral campaign in the month of May, the baron desires to spare himself too many trying experiences. Therefore he has summoned wireless to his aid. If the loudspeakers should prove to be inadequate, he will install a powerful electric bell, the vibrations of which, it is to be hoped, will suffice to safeguard the President's dignity.

With these aids at his disposal, Baron Tibbaut will be able to make as much noise as all the 186 members of the Chamber put together!"

CANADA.—An interesting case bearing on the responsibility for the electrical faults which make accidental deaths possible to those listening in, is reported by the *Daily Mail* as follows: Mrs. Joseph Legault, of Lakeside, Ontario, lost her life while listening to a wireless concert. She was using headphones and turned to switch off the light, when a complete circuit was established through the earth lead with a 2,000-volt power line which, experts agreed, was too near the house. She fell dead and her husband on the other side of the room received a severe shock. The municipal electrician of Pointe Claire said that he believed that high winds caused contact between the high-power line and the aerial, thus closing a circuit. Thereupon the jury, in face of the coroner's instructions to return a verdict of accidental death, held the municipality criminally responsible.

CHINA.—The recent conclusion of an agreement between the National Government and the Radio Corporation of America, says *The Electrical Review*, indicates an effort on the part of the Chinese to end the long controversy on the development of wireless telegraphy in which the United States, Japan, and Great Britain have been engaged. According to *The Times*, seven years ago an American concern, which has since become associated with the Radio Corporation, contracted to install one central and five feeder stations at a cost of $13,500,000 (£2,700,000) on terms which appeared to ensure an American monopoly of wireless in China to the exclusion of other interested countries. The Americans are now apparently content to cancel their former agreement in consideration of receiving an order to install at Shanghai two 20-kw. short-wave plants, at the trifling cost of $170,000 (£34,000). Whereas China a few years ago was committed to spend a great sum for a 700-kw. station, plus subsidiaries, she is now to obtain an installation which will give her equal facilities for communicating with Europe and America at one-eightieth of the price, or with attendant expenses for $350,000 (£70,000), instead of $13,500,000 (£2,700,000). One plant will be used to communicate with California and the other probably with Germany, and both will be completed early in 1930. The Chinese aim at operating their foreign telegraph communications themselves, thus disposing of the monopoly hitherto held by foreigners. The Mitsui contract of 1917 is now virtually a dead-letter, as the station completed at Peking in 1921, at a cost which, with interest and expenses, exceeded £1,000,000, is practically obsolete. Whether Japan can ever recover this amount from China remains to be seen. The British and Danish cable companies' monopoly of telegraphy in China expires in 1930. The interest of the Marconi Company in China, formerly confined to wireless, is now identical with that of the cable companies.

EGYPT.—The London Press recently reported that a wireless telephone message sent by a Vickers-Rolls-Royce biplane, testing locally with Croydon, England, was heard clearly by a flight-sergeant at a R.A.F. aerodrome near Cairo, over 2,000 miles away—a record in long-distance reception from an aeroplane in flight, so it is declared.

FRANCE.—According to *The Electrical Review* the French Post and Telegraph Authorities recently carried out certain improvements at the marine wireless station at Havre, as a result of which it is now capable of communicating with ships up to a distance of 1,550 miles during the day and over 3,000 miles at night.

GERMANY.—The number of broadcast receiving licences issued in Germany reached a total of 2,334,253 on Oct. 1, an increase since July 1 of 50,005.

The Flensburg station, the new Norag relay plant, has begun experimental transmissions. Its power is 1.5 k.w. and wavelength 219 m.

The German broadcasting authorities, on Nov. 15, started an experimental picture service from the wireless station at Königswusterhausen, the Fulton system of transmission being used as in Vienna and London. The times of transmission are from 3.30 to 4 p.m. and from 11.30 p.m. to midnight. The service started in Vienna on Oct. 15 from the Ravag station twice per day. (The Fultograph only transmits and receives still pictures.)

A Berlin policeman on point duty in that city is said to speak fluently in English, French, Bulgarian, Russian, Polish, Swedish, Finnish, Danish and Norwegian, in addition, of course, to his mother tongue. He should at times be worth his weight in gold in an international telephone exchange!

GREAT BRITAIN.—The developments of the Marconi Royalty position are as follows up to the time of going to press, the appeal of the Marconi company, from the Comptroller-General's (Patents) decision being yet to be heard.

From the *Wireless Trader* we gather that as a result of the recommendation of the Radio Manufacturers' Association with regard to the rendering by manufacturers of their royalty returns to the Marconi's Wireless Telegraph Co., Ltd., have been as expected. The recommendation was to the effect that the return should be accompanied by a statement indicating that the royalties had been calculated at the rate of 12*s.* 6*d.* per valve-holder up to Aug. 27, the date of the Comptroller-General's decision in the Brownie Wireless case. Manufacturers who have pursued this course have had their royalty cheques returned by the Marconi Co., accompanied by a letter from them stating that they are advised that the existing licence still holds good, and requesting the payment of all royalties due at the old rate of 12*s.* 6*d.* per valve-holder. The R.M.A. has issued the draft of a recommended letter for use by manufacturers in these circumstances which reads as follows:—

DEAR SIR,

Referring to your letter of . . . . returning our cheque for £ . . . . tendered in payment of the amount of royalty which, as shown on our rendered statement, we make to be due to your company, we have to advise in reply to your demand for a remittance for what you consider to be owing that, in view of the award in the Brownie case recently given by the Comptroller-General of Patents, we cannot be a party to the continuance of the charge of 12*s.* 6*d.* per valve-holder to the Public.

Consequently, we can do no more than notify you that we are holding at your call the amount shown in the statement already rendered to you and have to state that, if any other steps are contemplated by your company, our solicitors are Messrs. Blundell, Baker & Co., 16, Serjeants Inn, London, E.C.4, who will accept service on our behalf.

Yours faithfully,

An alternative draft letter is provided to meet cases where licensees have only rendered a return and have not tendered a cheque in payment of royalties. This alternative letter differs from the one given above only in the wording of the opening paragraph.

Carlisle.—Busy Women and the B.B.C.—At the Annual Conference of Women's Institutes held at Carlisle, it was decided to ask for the women's hour wireless talk to be broadcast in the evening instead of in the afternoon.

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Eighty institutes were represented, but only seven delegates admitted to hearing the women's hour. "Working women are too busy to listen in during the afternoon," it was stated.

Middlesborough.—Battery Eliminators again !—The Middlesbrough Corporation has completed arrangements whereby electricity consumers can be provided with wireless battery eliminators on a preliminary payment to the Corporation of £1, with half-yearly payments of £1, completing the purchase in five years. According to the *Wireless World*, the device has been designed by Mr. R. H. Scotson, borough electrical engineer; it can be plugged direct into an ordinary lamp socket, and will feed the anode and filament circuits of any kind of valve set. The Corporation is manufacturing the eliminators itself.

Continental Interference and the B.B.C.—Interference by certain Continental stations having caused considerable trouble to relay stations in this country, the B.B.C. has decided, as an experiment, that in December all relay stations shall broadcast on one exclusive wavelength, namely, 288.5 metres.

It is understood that B.B.C. engineers have made a preliminary inspection of sites for their Northern station in the Barkisland area, near Sowerby Bridge, on one of which a high-power broadcasting station may be erected under the regional broadcasting scheme.

After six weeks' study of United States telegraph methods, a special delegation from the British General Post Office has returned to London. The party consisted of Mr. L. Simon, secretary of the Inland Telegraph Branch, Mr. Stuart Jones, controller of the Central Telegraph Office, Col. Lee, an assistant engineer-in-chief who specialises on the wireless side, Mr. G. T. Archibald, inspector of telegraph traffic, and Mr. A. E. Stone, assistant engineer. The delegation will report in due course to the Postmaster-General.

The visit, it will be recalled, was a sequel to one of the recommendations of the Hardman-Lever report.

There are very persistent Press statements, both in this country and the colonies, regarding a suggestion for linking the British Empire by a wireless telephone service.

Concerning the practicability of such a scheme *The Electrical Review* says: "Investigations commenced some time ago, the idea being to extend the Rugby plant so as to afford direct two-way communication with Australia, South Africa, Canada and India early in 1930. The present transatlantic service is maintained by means of high-power long-wave apparatus, but it has been demonstrated that it is possible to use the Marconi short-wave beam system for telephony with less power. Besides the long-wave channel working to America there has been inaugurated recently at the Cupar (Fife) receiving station a short-wave channel. A special receiving array, or system, for aerials has been erected, but as the wavelength used (which lies between 16 and 32 metres) is so small, the antenna need only be of the order of 60 yards long. A special receiver has to be used for such high frequencies, and successful working has been obtained with the system.

The average daily all-in cost of the Rugby wireless station, says the *Electrician*, including the receiving stations worked in connexion with it, was, from May 1 to Sept. 30, 1928, £383, and the average daily revenue was £397.

The number of wireless licences in force is over 2,500,000. It is not believed that there is any widespread evasion of payment of licence fees, nor that owners of portable sets are more prone to evade their obligations than other members of the community.

The *Wireless Trader* reports that during August last radio apparatus valued at £69,974 (valves £12,617) was exported from this country. The principal market was Australia, whose share amounted to £11,318 (valves £3,917). The value of the goods taken by India and Burma was £11,105 (valves £344), and the next in order was the Netherlands, £6,161 (valves £155). Other important customers were Spain, £4,830 (valves £31); France, £3,781 (valves £8); New Zealand, £2,648 (valves £658); the Irish Free State, £2,575 (valves £1,579); Norway, £2,473 (valves £544); and Belgium, £2,009 (valves £61).

Parliamentary Questions.—On Nov. 8, in reply to questions by Lieut.-Commander Kenworthy, Sir W. Mitchell-Thomson (Postmaster-General) said that he knew of no system which was at present capable of transmitting moving pictures of actual events for satisfactory reception by wireless listeners. He had not refused permission for the use of the British Broadcasting Corporation's stations for television tests. The Governors of the Corporation decided, in the exercise of the discretion vested in them, after a demonstration by the Baird Company which held an experimental licence, that the system did not at present fulfil the conditions which would justify a public trial through one of their stations. He had recently received an application from the Baird Company for further facilities. That application was at present under consideration.

From a report from the British Commercial Secretary at Cairo on the financial and economic situation of Egypt the following paragraph should prove interesting :—

The Eastern Telegraph Company, in accordance with the terms of its agreement of September, 1926, with the Egyptian Government, laid two new submarine cables (making three in all) between Alexandria and Port Said during 1927 to connect with its new underground lines between Port Said and Suez. As a result, however, of the refusal of the Egyptian Government to sanction the request of the company (which was originally put forward in connexion with the terms of the above-mentioned agreement) to lay a cable from Port Said to Haifa, the latter port has been linked up with Cyprus instead, and the consequent effect on the Egyptian Government revenue from external telegraph traffic has had to be provided for in the budget for 1928-29.

From the weekly finance article of "The Electrical Review."—The Marconi market continues to be a centre of lively activity and a good deal of excitement. The Americans are taking an active hand in the shares, and it is said that a good many thousands crossed the Atlantic during the month of October. There is no doubt as to the company having a large American proprietary. The price of the shares has touched nearly £4, New York accepting London's prices when the latter have been put up with a run, and London being a fairly consistent seller to New York.

The London and North Eastern Railway of Great Britain is about to experiment with a new automatic lighting system—which switches the light on or off according to the need of the moment. If darkness falls or the train enters a tunnel, the electric lights will be switched on without human intervention, and when daylight comes again the device switches the lights off.

This device is the invention of Radiovisor Parent, Ltd. In brief, it consists of a selenium cell. Selenium is affected by light and, by an ingenious system in which electrical relays are used, it has been found possible to make the selenium switch electric lights off and on according to whether light is or is not falling on the cell.

GREECE.—It is reported from the Ministry of Communications in Athens than an international competition is being opened for the establishment and working of a radio monopoly in Greece for a period of 20 years. After the expiration of that period all the installations will pass free of charge into the possession of the State; after the lapse of ten years the State may take power to acquire by purchase the whole of the radio equipment. Within three months after the ratification of the concession the concessionaire will be required to form a Greek company in Athens, the share capital in which must be held to the extent of three-eighths by Greeks, and three-eights of the directors are also to be natives. It is stipulated that a central transmitting station must be established in Athens, capable of ensuring "objectionless" reception throughout Greece. The details of the competition are shortly to be published and sent to Greek representatives abroad for public communication, and offers are to be sent in within three months to the Ministry of Communications, Radio Department, Athens.

It should be interesting to follow the history of "*objectionless* reception" !

The *Electrician* adds that some of the artistes employed may be foreigners.

HOLLAND.—*Herrings and Radio* !—Reuter's Amsterdam Agency records that increasing numbers of Dutch herring fishing boats are being equipped with simple wireless installations for picking-up wireless broadcast information regarding prices, suitable fishing grounds, metereological reports, &c. Already one-third of the steam and motor luggers are equipped with the necessary receiving sets, the cost of which is small compared with their utility. To judge by the results achieved to date, it is not too much to anticipate that, if not all, at least the large majority of Dutch herring fishing boats will be similarly equipped in 1929.

A new short-wave c.w. transmitter, with call sign PBF5, is now operating from Eindhoven on a wavelength of 41.3 metres. The station is intended for communication with amateur stations throughout the world, and anybody who hears this station is requested to communicate with Philips Lamps, Ltd., says *The Electrical Review*.

Mr. J. M. Baird is reported to have reached an agreement with the Dutch wireless authorities to transmit television images from their station at Scheveningen. A State transmitter is said to have been placed at the disposal of the Dutch company holding the rights of the Baird apparatus. Transmission will be, it is said, on a wavelength of 1,470 metres.

Reuter's Amsterdam Agency states that radio-telephone communication *between special studios* in Amsterdam, Rotterdam and The Hague, and the Dutch East Indies, are to be opened to the public on Jan. 7. Thirty florins will be charged for an ordinary conversation of three minutes, 60 florins for an urgent call, and 120 florins for immediate communication. Ordinary and urgent conversations will have to be booked on the previous day before 6 p.m.

INDIA.—Mr. Eric Dunstan, general manager of the Indian Broadcasting Company, and a number of other European members of the staff recently resigned owing to disagreement with the board of directors on questions of policy, says the *Daily Telegraph*. Mr. Dunstan was one of the early members of the B.B.C. staff in London. His efforts to build up a successful broadcasting system in India have, however, been largely hampered by lack of funds.

The *Financial News* further reports that Marconi's Wireless Telegraph Co., Ltd., has consented to finance the Indian Broadcasting Co., whose prospects hitherto have been so unsatisfactory, resulting in the recent resignation of five of the leading members of the European staff, including Mr. Eric Dunstan, general manager. Mr. Sultan Chinoy, a director of the Indian Broadcasting Co., has just returned to Bombay from England, where he appealed for support for Indian broadcasting on the ground that the Indian Radio Telegraph Co., which is associated with the Broadcasting Co., would suffer.

The latest and more reassuring news is a message from Reuter's Agency at Bombay, which reports that the Indian Broadcasting Company has now

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announced that broadcasting in India will be continued, and that every effort will be made to make the broadcasting a success.

IRISH FREE STATE.—The Dublin wireless exhibition (Oct. 8 to 13) was opened in the Mansion House by Mr. M. R. Heffernan, Parliamentary Secretary to the Free State Minister for Posts and Telegraphs. It was organised by the Irish Radio Traders' Association, and the goods shown were almost exclusively of British manufacture. Mr. Heffernan said their ambition was to bring reception within crystal set range of the greatest possible part of the Free State population. Two possible forms of extension were involved: a number of short-range stations, or a high-power station to serve the whole country. The latter would be the more satisfactory, but they were faced with technical difficulties. He believed that the recent conference in Berlin of the International Union of Radiophony had approved the allocation of a wavelength that would suit the high-power requirements. They hoped soon to lay a scheme before Dail Eireann for the future development of broadcasting in the Free State.

Radio v. *Submarine Cable.*—The Galway County Council has been informed by the Free State Government that it has decided to restore communication with Innisboffin Island, lying off the Connemara coast, Co. Galway, by means of wireless-telegraphy, which has come to be regarded as the most reliable means of communication between the mainland and the remote island.

JAPAN.—A report on the economic conditions in Japan up to the end of June last, compiled by Messrs G. B. Sanson, C.M.G., and H. A. Macrae, M.A., Commercial Counsellor and Acting Commercial Secretary of the British Embassy, Tokio, contains the following interesting paragraph on "Broadcasting and Radio Apparatus" in the county in question :—

"Radio broadcasting was commenced in Japan about three years ago, but the power of the three original stations at Tokio, Osaka and Nagoya provided only a small 'crystal range,' and the demand was mainly for valve sets, which limited the demand to those who could afford these sets. Now, however, the power of the Tokio and Osaka stations has been raised to 10 kw.; Nagoya is expected to follow suit, and six similar stations are being opened. These developments, it is expected, will greatly increase the use of inexpensive crystal sets. At the commencement dealers in radio apparatus overstocked considerably, and consequently, in 1926, there was a severe slump, and many dealers failed. Now these surplus stocks have been cleared off, but in the interval Japanese firms have taken up the manufacture of apparatus. The import duty upon radio apparatus was originally 20%, but a year or so after it was raised to 40%. This practically eliminates business in made-up articles, which are now turned out in Japan, but there is still some opening for materials required by the Japanese makers, such as good quality magnets, enamelled wire for coils, &c. Such parts as transformers, condensers, &c., and complete sets are practically ruled out. Some opportunity should occur for headphones, which are not made in Japan to any extent. Generally speaking, English headphones are too dear as compared with German. Valves are made in Japan, although some business is still done in American 'tubes.' British makers must remember that the American style base is employed in Japan. Contrary to a very prevalent idea, quality and condition are studied in Japan, and manufacturers must attend to this and cater especially for the needs of the market."

JAVA.—A world's record for long-distance wireless-telephone communication was established on Oct. 4, says *The Times*, by a call between Bandoeng (Java) and Buenos Aires via Kootwyk (Holland) and Nauen (Prussia). Although communication was actually established, the experiment was not entirely successful and the trials will be continued.

Nearly a month later, however, a Reuter message from Sydney (N.S.W.) stated that two-way radio conversations were held on Oct. 31 by wireless telephony over a triangular circuit including Sydney, Java and Schenectady (N.Y.). The audition was said to have proved most successful.

MALAYA.—*Line Shortage relieved by Radio!*—The chief secretary, Mr. W. Peel, in his Budget speech before the Federal Council, forecast the early introduction of carrier telephony. The extent to which it is intended to extend internal communication facilities in Malaya is indicated by an order which has been placed with the Crown Agents for two complete sets of carrier telephone apparatus, one each for Kuala Lumpur and Ipoh, which is the first section which will be operated. On its success, says the *Financial Times*, will depend whether two further sections will be started next year. Being an innovation, the manufacturers, the Standard Telephones & Cables, Ltd., have been requested to send out an engineer to install the apparatus. At present the trunk lines are extremely congested, and the new installation is expected to relieve them.

RUSSIA.—The People's Commissariat for Posts and Telegraphs of the U.S.S.R. has decided, says the *Daily Telegraph*, to build several new short-wave radio stations in Middle Asia, namely, in the Pamirs, Khorog, and Hassan-Kuli.

SEYCHELLES ISLANDS.—*A Wireless Station for Sale! Complete!*—A complete wireless station among the Seychelle Islands, in the Indian Ocean, is for sale. It was built during the war for the Navy, says *The Electrical Review*, but the Admiralty wants it no longer, and the Governor of the Seychelles invites tenders from anybody who wants to buy it.

SOUTH AFRICA.—What is claimed to be the most powerful broadcasting station in the Empire outside Great Britain was opened on Oct. 22 by Mr. W. Madeley, South African Minister of Posts and Telegraphs. The station will serve the Union of Rhodesia, and under favourable conditions can communicate with Britain, says the *Evening News*. It is situated on the highest point of the Witwatersrand at an altitude of about 6,000 ft.

SWEDEN.—Reuter's Trade Service informs us from Stockholm that the number of wireless receiving licences issued in Sweden continues to increase, and the total number issued is now 371,000, or 61 per thousand of the population.

SWITZERLAND.—From Berne, through Reuter's agency, we learn that the Swiss Wireless Company has decided on the construction of a wireless receiving and transmitting station near Geneva, at the cost of a million francs. It is expected that the station will be ready next summer.

TURKEY.—It has been reported that the Radio-Angora station was officially opened on Nov. 1, and is declared to be operating on a wavelength of 1,600 m. with 5 kw. power. It is not known whether a new station is referred to, or whether the existing Angora plant (1,818 m., 20 kw.) has been modified.

U.S.A.—Reuter's Trade Service, New York, reports that a survey prepared for the National Broadcasting Company shows that there are 9,640,348 families operating receiving sets in the United States, with an estimated audience of 41,453,496.

The United States Presidential campaign wound up in a blaze of oratory. Dozens of speakers, both Republican and Democrat, made their last frenzied appeals to the huge electorate.

For the first time in history, millions of prospective voters in isolated country districts were reached by wireless broadcasting, a form of propaganda on which both parties spent vast sums of money. The Democrats in this connexion admit an expenditure of at least £120,000, while the Republicans have probably spent as much if not more.

General and Personal.—Private Companies.—The half-yearly dividend of the Dubilier Condenser Co. (1925), Ltd., has been declared on the 7½% cumulative preference shares.

The directors of W. T. Henley's Telegraph Works Co., Ltd., have declared an interim dividend on the ordinary shares of 1*s.* 6*d.* per share, less tax, to be paid on Dec. 1. The same rate was paid last year.

An interim dividend at the rate of 5% per annum, free of tax, has been declared by the Indo-European Telegraph Co., Ltd.

The report of the Amazon Telegraph Co., Ltd., for the year ended June 30 last records a gross revenue of £56,680 (against £62,114 in 1926-27) and working expenses of £35,968 (£34,221). After providing for debenture interest and sinking fund and income tax, and adding £3,412 brought in, there remains a balance of £940 to be carried forward.

The committee representing the £1 ordinary shareholders in Marconi's Wireless Telegraph Co., Ltd., points out in a circular just issued, says the *Financial News*, that the need for protection through the committee arises from the fact that, while according to the best legal opinions obtainable, the £1 ordinary shares rank for dividends and in a winding-up for a return of capital for twice the amount of the 10*s.* ordinary shares, the board appears to contemplate an exchange of shares on a basis which would be less favourable to the holders of the £1 ordinary shares than would be the case if all the assets of the Marconi Co. were sold for shares in the merger company, and if the latter shares were distributed in a winding-up among the Marconi shareholders according to their legal rights. The committee awaits the publication of the scheme before formulating considered proposals for the protection of the £1 ordinary shareholders.

The Electrical Review states that it was announced later that a similar committee had been formed on behalf of the holders of the 7% cumulative participating preference shares. The committee consists of Sir Richard Davies, C.B.E., Mr. F. P. Robjent, Mr. H. Guedalla, and Mr. A. Kohnstamm, with Mr. Bernard Wicks as secretary.

As regards the Irish shareholders, the *Electrician* states that "the Marconi Irish Shareholders' Association on Oct. 22, passed a resolution that the committee had under consideration a reply from the board, dealing with the division of shares in the proposed merger company, and also a fairly full statement giving clear indications of proposals. Both were deemed very satisfactory, and the committee was of opinion that the 10*s.* shareholders would find that they had been fairly treated when the proposals had been circulated by the merger company."

It is understood that something in the neighbourhood of £300,000 has been mentioned as the price to be paid for the sale to the Eastern Telegraph by the London County Council of certain buildings—formerly the Education Offices—as the future offices for the "merger" company.

Mr. H. M. Pease has relinquished the position of managing director of Standard Telephones & Cables, Ltd., due to the pressure of work occasioned by his position as vice-president and general manager in Europe of the International Standard Electric Corporation. Mr. Frank Gill has been appointed chairman of the board and Mr. E. S. Byng, managing director of the company.

For our Advertisers.—Contracts Open.—Where not otherwise indicated quote reference and apply Department of Overseas Trade, London, S.W.

Postmaster-General's Department, Melbourne, Dec. 11.—Supply of instrument cords. (Schedule C. 374.) (Reference B.X. 4,811.)

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Postmaster-General's Department, Melbourne, Dec. 11.—Supply of telephone generators. (Schedule C. 375.) (Reference B.X. 4,812.)

South African Posts and Telegraphs, Dec. 13.—Supply of solder, copper wire, and cable. (Reference B.X. 4,799.)

ANGORA.—Department of Posts, Telegraphs, and Telephones, Dec. 18.—Supply of 50,000 metres of rubber-covered field telephone wire. (D.O.T.)

Postmaster-General's Department, Melbourne, Dec. 18.—Supply of motor generating sets. (Schedule C. 377.) (Reference B.X. 4,810.)

Postmaster-General's Department, Melbourne, Dec. 18.—Supply of lamps, lamp caps and lamp sockets. (Schedule C. 378.) (Reference B.X. 4,819.)

New Zealand Government Railways, Dec. 20.—Sub-station equipment, including switchgear, transformers and cables, for Frankton Junction power and signalling supply. (Specification No. 101.) (Reference B.X. 4,771.)

South African Department of Posts and Telegraphs, Dec. 20.—Supply of telegraph materials, including 30,600 tubular arms (4, 8 and 12-wire), 50,000 galvanised clipstalks; 180,000 insulators, 600,000 nails; 24 ft. iron poles (to specification 57A and drawing No. 609); 2,000 upper tubes, 2,000 bases, 2,000 screw rings and 2,000 lightning rods for same; parallel poles for farmer's lines (to specification No. 1,240 and drawing C.E. 134A); 5,000 upper tubes, 50,000 bases, and 50,000 wedges for same; 30,000 suspension rings, 80,000 spindles; 2,500 rolls of tape and 12,000 lb. of stranded steel wire. (Tender No. 134.) Schedule, specifications, &c., can be seen at the Department of Overseas Trade.

New Zealand Posts and Telegraphs, Jan. 15.—Supply of telephone cords (tender No. P. and T. 151/1,084). (Reference B.X. 4,847.)

New Zealand Public Works Department, Feb. 12.—Supply of 110 kv. switchgear and controlling equipment, for Waitaki power scheme, section 3. (Reference B.X. 4,848.)

Promotions.—Mr. J. G. King, Superintendent Cable Room, C.T.O., to be Superintendent Higher Grade. This is a provisional appointment, and thus one is taking a certain risk in *these* days in heartily congratulating the recipient.

To Mr. A. T. Simmons, also of the Cable Room, C.T.O., whose Provisional Overseership has been made a substantive appointment, one need have no qualms in letting one's self go.

GOVERNMENT AIDS TO INDUSTRY.—There is a great need of better and fuller statistics of production of capacity and unfilled orders than we have at present. What was wanted, if it was to be of practical value to industrialists, was live and up-to-date information, which would help them in forecasting the future trend of business. Although it was conceivable that industries could organise this service for themselves without Government aid, there was little doubt that it would be organised more quickly and completely if industry had the backing of a Government Department, which would plan the main lines of the work and could have some power of coercing a recalcitrant minority. Here, a Government Department had the great advantage of being disinterested and impartial, and able to keep a secret, and in a matter of this sort these things counted for a great deal.—*Sir Henry Bunbury.* J. J. T.

REVIEWS.

"*Introduction to Theoretical Physics.*" *By Arthur Haas, Ph.D. Vol. I. Second Edition revised. (Published by Constable & Co., Ltd. xiv + 333 pp. Price 21s. net.)*

Last year we had the pleasure of reviewing a book by Dr. Haas on Atomic Theory. This was an extract from the second volume of Dr. Haas' large work on Theoretical Physics.

A second edition of the full work is being issued, and the first volume of this new edition is now available. The subject is treated with the same clearness of exposition which we noted in the smaller book. The notation used is consistent throughout, a great comfort to the reader, who is saved the annoyance of having continually to check the meaning of the symbols which he meets.

The mathematical discussions are extremely clear, and full demonstrations are given. The expression "It is evident that," that bugbear of students, is conspicuous by its absence.

The book is divided into two parts, Part I dealing with Mechanics, and Part II with Electromagnetic Theory.

Part I comprises chapters on the motion of a Free Particle, the General Principles of Mechanics, the Motion of Rigid Bodies, the General Theory of Vector Fields, the General Theory of Vibrations and Waves, the Motion of Deformable Bodies, and the Theory of Potential.

The second part treats of the Fundamental Laws of Electricity and Magnetism, Maxwell's Theory of the Electro-magnetic Field, and the Theory of Optics.

The need for a thorough grounding in physics is felt nowadays by students in nearly every branch of science, and in our opinion Dr. Haas' book is one of the very best which we have met for enabling the student to acquire this knowledge with the minimum of misdirected effort. He is led on logically, step by step, so that he finally obtains a view of the whole subject in which the various component parts fall naturally into their places to form a consistent whole, and which is immediately available for any further use to which he may need to apply it in the course of his work.

"*Probability and its Engineering Uses.*" *By Thornton C. Fry, Ph.D., member of the Technical Staff, Bell Telephone Laboratories. (Published by Macmillan & Co. xiv + 476 pp. Price 30s. net.)*

In the early days of engineering questions involving chance and probability had seldom or never to be considered. A bridge had to be built or a dam constructed, and the maximum conditions which had to be met were all more or less accurately known. To allow for possible defects in the material, or underestimates of the stresses to be withstood, a factor of safety was introduced, and after that everything was quite straightforward and definite.

The modern developments of transport and communication engineering, however, have introduced quite a different type of problem. It is now necessary for the engineer to estimate, say, the probability that the number of junction lines provided for an automatic exchange will be sufficient to deal with the traffic during the busiest period of the day with not more than a definitely allowed proportion of lost calls. Many similar problems arise in which the balance has to be held even between extravagance in the provision of plant and non-permissible loss of service.

The book under review, which is an expansion of notes for a course of lectures to the staff of the Bell Telephone Laboratories, deals with that particular portion of mathematics which treats of the theory of probability, from the definite viewpoint of its application to the solution of engineering problems.

After an introductory chapter dealing with fundamental definitions and axioms there follow a chapter on permutations and combinations and one on elementary principles of the theory of probability.

The next two chapters treat of the investigation of questions of probability by means of experiments.

The sixth chapter deals with distribution functions and continuous variables. In the seventh the various types of averages met with in statistical work and the deviations of numbers from the average of the set are discussed.

The next chapter deals with the distribution functions most frequently used in engineering, and discusses their application to such problems as those which arise in connexion with the traffic at a telephone exchange. The following chapter deals with the methods of inferring distribution functions from observational data.

In the tenth chapter, which is one of the most interesting in the book, the previous work is applied to the various problems of congestion which arise in such practical fields as the working of a telephone system.

The final chapter deals with the application of the theory of probability to a number of important questions in physics.

In an appendix are given a collection of useful tables for facilitating the working out of numerical problems.

The book is one which will be found very useful for those who are engaged in work in which probability problems are met, and who are desirous of obtaining the knowledge necessary to deal with such problems without having to study a wide range of literature for the purpose.

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PROGRESS OF THE TELEPHONE SYSTEM.

THE total number of telephone stations in the Post Office system at Sept. 30, 1928, was 1,687,275, representing an increase of 9,319 on the total at the end of the previous month.

The number of stations working at Sept. 30 in London, England and Wales (excluding London), Scotland and Northern Ireland was as follows :—

	No. of Stations at Sept. 30, 1928.
London	599,003
England and Wales (excluding London) ...	914,696
Scotland	152,574
Northern Ireland	21,002

The growth for the month is summarised below :—

	London.	*Provinces.*
Telephone Stations—		
Total at Sept. 30	599,003	1,088,272
Net increase for month	3,661	5,658
Residence Rate Subscribers—		
Total	140,189	222,734
Net increase	1,407	1,831
Call Office Stations (including Kiosks)—		
Total	5,429	19,661
Net increase	29	136
Kiosks—		
Total	1,119	4,499
Net increase	38	107
Rural Party Line Stations—		
Total	—	10,363
Net increase	—	49
Rural Railway Stations connected with Exchange System—		
Total	—	984
Net increase	—	9

The total number of inland trunk calls dealt with during July, 1928 (the latest statistics available) was 9,502,807, an increase of 707,645, or 8% on the figure for the corresponding month last year.

Outgoing international calls in July numbered 35,743 and incoming international calls 38,506, representing increases of 10,695 (42.7%) and 11,850 (44.5%) respectively over July, 1927.

Further progress was made during the month of October with the development of the local exchange system. New exchanges opened included the following :—

LONDON—Chigwell, Rainham.

PROVINCES—Colne, Horsham.

And among the more important exchanges extended were :—

LONDON—Brixton, Maryland, Willesden.

PROVINCES—Barnt Green, Boston, Didsbury, Hoylake, Knock, Mansfield, Potters Bar, Solihull, Walton-on-Thames.

Seventy-five new overhead trunk circuits were completed, and 79 additional circuits were provided by means of spare wires in underground cables.

THE G.P.O. PLAYERS DRAMATIC SOCIETY IN "OUTWARD BOUND."

TRUE to its tradition of offering to its supporters only works of intrinsic merit and interest, the G.P.O. Players presented on Nov. 9 and 10 last Sutton Vane's much-talked-of play, "Outward Bound." This ingenious allegory in which seven or eight mortals find themselves bound for eternity on board a mysterious vessel, without officers and without crew, contains some thrilling moments—notably when perception dawns on the passengers that they are no longer in the land of the living and are, moreover, in disquieting doubt as to their destination. Allegories are ticklish weapons to handle, but Mr. Sutton Vane keeps his instrument sharp and bright throughout. With it he endeavours to pierce the mystery of the after life, and the result is both moving and impressive. The ultimate meeting of the departed souls with the Examiner loses some of its terrors when it is found that he is considerate and understanding and is prepared to give them a fresh start on the Other Side. That was a happy and surprising touch by which the two lovers find themselves called back to earth, and furnished a dramatic conclusion to the piece.

The general level of the acting was so good, that it is difficult to single out for praise any of the individual artists. The performance was sure of touch and finished throughout. Mr. Cyril Leigh as Scrubby, Miss Emery as Ann, Mr. Jack Scott as Henry, Mr. Sellars as the Examiner, Mr. Cahill as a hustling representative of Big Business in Parliament, were all excellent. Laurence Gartland as Mr. Prior, Gerald Storr as the Rev. William Duke looked and acted their parts to the life, and Miss Beatrice Cowan as Mrs. Cliveden Banks was a perpetual joy. If we may single out any character for special commendation, we would mention Miss Isabel Hood, who raised her comedy part at the dramatic moment to the tragic plane, but some most moving and sincere acting. The play was produced by Mr. Julien Mitchell, and in his absence, the call for the producer at the close of the play was responded to by Mr. Hatswell, who made a happy reference to the assemblage on the stage in the words *De mortuis nil nisi bonum*, and, indeed, nothing but good could be said of those "Dead."

W. H. G.

POST OFFICE SANATORIUM SOCIETY.

THE Post Office Sanatorium Society, by its methods and successes, has been referred to very frequently by well-known experts on consumption as being the most significant and useful object lesson ever given by the working-classes. That such a result should have been obtained, and that such an impression should have been created within 21 years of the commencement of its official operation, is a great tribute to the value of the society. The society itself stands as a unique example of what working men and women can do by self-help and co-operation at minimum cost with maximum results. In its capacity as exemplar it has given a tremendous impetus in stimulating interest and encouraging practical application. Indeed, it may be said with perfect fairness that the Post Office Society has exerted considerable influence on the public movement in Great Britain towards combating and stamping out what has been truly termed "the white scourge." Prevention and treatment of consumption are both a public and a personal duty, and of these prevention is undeniably the most important. It is a melancholy reflection that few homes have escaped consumption's ravages; few families exist in which the loss of a dearly-loved parent or child does not testify to its deadly nature. The society exists for the purpose of alleviating anxiety and relieving distress, and so adds materially to the well-being and happiness of Post Office employees. Incidentally it contributes towards the progress of the national movement against the country's most deadly disease, and consequently it is worthy of practical consideration.

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READING INDUSTRIES EXHIBITION TELEPHONE STAND.

ALTHOUGH the telephone service, in this country at any rate, is conducted as a public service, there is a distinctly commercial side to it; therefore the holding of a telephone stand at an industrial exhibition should not be very surprising. As a purely local Departmental effort, however, it is believed that telephone exhibit at the Reading Industries Exhibition during the week ending Oct. 6 was unique, and, for that reason, some impressions gathered during the time might prove of interest.

Briefly, the stall displayed an automatic telephone exchange working on three digits with four lines connected. In addition, apparatus in more common use locally was shown together with sections of underground cables. A large supply of advertising literature was, of course, available.

It can be said at once that the exhibit was a success when judged by the standard of interest taken in it by the public. A reason for this display of interest is easy to find: the industries of a small town are generally familiar to most of its inhabitants, and only the most elaborate window dressing can hold a Readingsian's attention to biscuits, for example! It is true that the telephone is a common enough object, but the uncanny intelligence of automatic selectors is ordinarily withheld from the public eye—it is the unfamiliar and unusual which excites the jaded public taste. Again, we had something in motion—a thing that is quite irresistible to a man who was once a boy!

To turn to the purely business aspect, it is too early yet to judge direct results, but it may be stated that orders taken during the week put the effort on a paying basis. In addition to ten orders taken, requests for four estimates for private automatic branch exchanges were made—a large number for a town of this size when it is considered that seven establishments are already equipped. The public call office installed (which, by the way, was accepted by the Exhibition organisers in lieu of payment of rent for the stand) collected between three and four pounds during the week.

With regard to the after effects of our efforts, as has been said, it is too early to give any details, but some thousands of leaflets and cards were judiciously distributed, and it is inconceivable that these can have no result when combined with the general advertising effect.

Leaving the measurable profit side of the Exhibition, the writer—who was in attendance the whole time—is convinced that the psychological effect was excellent, and must be eventually reflected in actual business. One could not but gather the impression that many left our demonstrations and explanations viewing the possibilities of the telephone in the home and office from a different angle—seeing it as a possible, not very expensive, addition, not as some luxury of the rich, conducted by some far-away abstract administration which existed as a target for newspaper abuse. We tried, and I think partially succeeded, to make them see it as a thing people were "going in for," like electric light. More or less the same thing was shown in conversations with heads of the more important business firms. They came to chat with us more as associates, keen and willing to do business as they were. Possibly they knew that before, but in many cases the thought was largely subconscious. Practically expressed, they would agree to rent additional telephone facilities, not as a kind of necessary evil, but rather as purchasing "good goods"—regarding the transactions as good bargains more than as a tax. A thoughtful person must, in a very generous moment, have some sympathy with income tax officers, and the writer, who has had some experience with the public, has often felt that some measure of this sympathy could justly be given to the telephone accounts department!

Another point: permitting subscribers, potential and actual, to have a peep behind the scenes of telephone working is almost certain to have a good effect. Readers of the *Journal* will remember a letter from Mr. F. T. Hood, in the May issue, on this subject—it would be hard to disagree with his observations.

In conclusion, to the possible question, "Are such displays worth while?" the answer can only be "Yes." It has been amply demonstrated that in not too magnificent an exhibition an effective telephone display can be made with little apparatus and expense. The Reading effort shows that immediate profit can be looked for, though the writer considers this of less importance than the psychological effects. We admit, as indeed we must, the commercial side of telephone service; we advertise and expand the Contract Branch which is exclusively occupied with this side. Surely it would then be unwise, to say the least, to neglect any economical scheme to accelerate the growth of the service.

F. J. LANE, *Contract Officer.*

PRESENTATION TO MR. F. T. WADLEY.

ONE of the happiest and most enjoyable gatherings at which the writer has been favoured to be present was certainly the Bohemian Concert of the Fortels Sports Club (Cable Room, C.T.O.), held on the 6th of last month at the First Avenue Hotel, Holborn, when this function was made the occasion to present Mr. Wadley, late Assistant Controller of the Foreign Cables, &c., with a gold watch as a token of the high esteem in which both staff and supervision have held him throughout the whole period of his control of this important branch of the British telegraph service, and to wish both their late chief and his esteemed wife, Mrs. Wadley (*née* Edith Agnes Hood) a long and happy retirement.

A particularly choice souvenir was also presented to the latter in the shape of a jewelled pendant.

Mr. J. G. King, Senior Superintendent, made the presentations in a speech which ably expressed the united feelings of affection with which all present and the many detained on duty parted from their head.

Mr. Wadley replied on behalf of himself and Mrs. Wadley with a sustained composure which, however, could not entirely hide that "something too deep for words," and the musical honours which followed afforded a welcome opportunity to many of us to give vent to our feelings.

Commander Grattan, who has succeeded Mr. Wadley as Assistant Controller, followed with a few appropriate remarks and presented the special "pots" to the heroes of the last season.

The musical programme, an excellent one under the direction of Mr. John Fox, was then continued, the interval having been specially set apart for the presentation by the courtesy of the Fortels Committee.

To name the artistes will be sufficient to indicate the front line quality of the musical and elocutionary talent provided, viz., by Miss Marjorie Holton and Miss Sybil Maden, by Messrs. Claude Pilgrim, Merlin Vaughan, Arthur Brough, Bert Sainsbury, Ernest Elliott and Harry Hearne, not forgetting Mr. Lionel Stanton, the accompanist, or the piano soloist, Mr. Lewis Dinsmore.

Earlier in the same day the Controller's Office was the scene of further marks of esteem, a handsome travelling clock and a lady's bag being handed appropriately to the happy pair.

T.

TELEGRAPHIC MATTERS.

BY H. P. STEED.

AT a recent meeting of the P.O. Telephone and Telegraph Society, at which attention was drawn to the great variety of different telegraph systems in use, it was intimated that a serious attempt will be made to reduce these to three, namely, sounder, teleprinter, and multiplex.

Apparently the sounder would be retained for working to offices which have insufficient load to warrant the expense of providing teleprinters. This policy seems to be undesirable in view of the need of uniformity, not only from an operating point of view, but for engineering reasons. It is a matter for consideration whether very lightly loaded offices might not be more suitably catered for by means of the telephone, and that teleprinters be installed at other offices to a much greater extent than is immediately contemplated.

Apparently the retention of the multiplex distributor is inevitable, despite the attractions of voice-frequency proposals.

For not altogether appreciating the efforts of inventors, the writer has been called a "Troglodite." Inventors are, however, generally harmless, provided their ideas are focussed in the right direction. I suggest, therefore, that telegraph inventors should now attempt to supersede the present multiplex automatic transmitters by means of teleprinters adapted for multiplex working.

Possibly the first thing to do would be to replace the five segments on a distributor, required for one arm, by means of a long single segment occupying the same space as the five.

The cadence signal would still be needed; but rhythmic type-writing movements should present no great difficulty. The synchronism of teleprinters, as such, would be independent of the distributors and the long segments on the distributors should permit of a wider margin of variation of speed without interference with the working of the teleprinters. The rate of rotation of the brushes could be adjusted to suit operating speeds, and might even be slow enough to enable the older telegraphists to perform teleprinter operating sufficiently satisfactorily.

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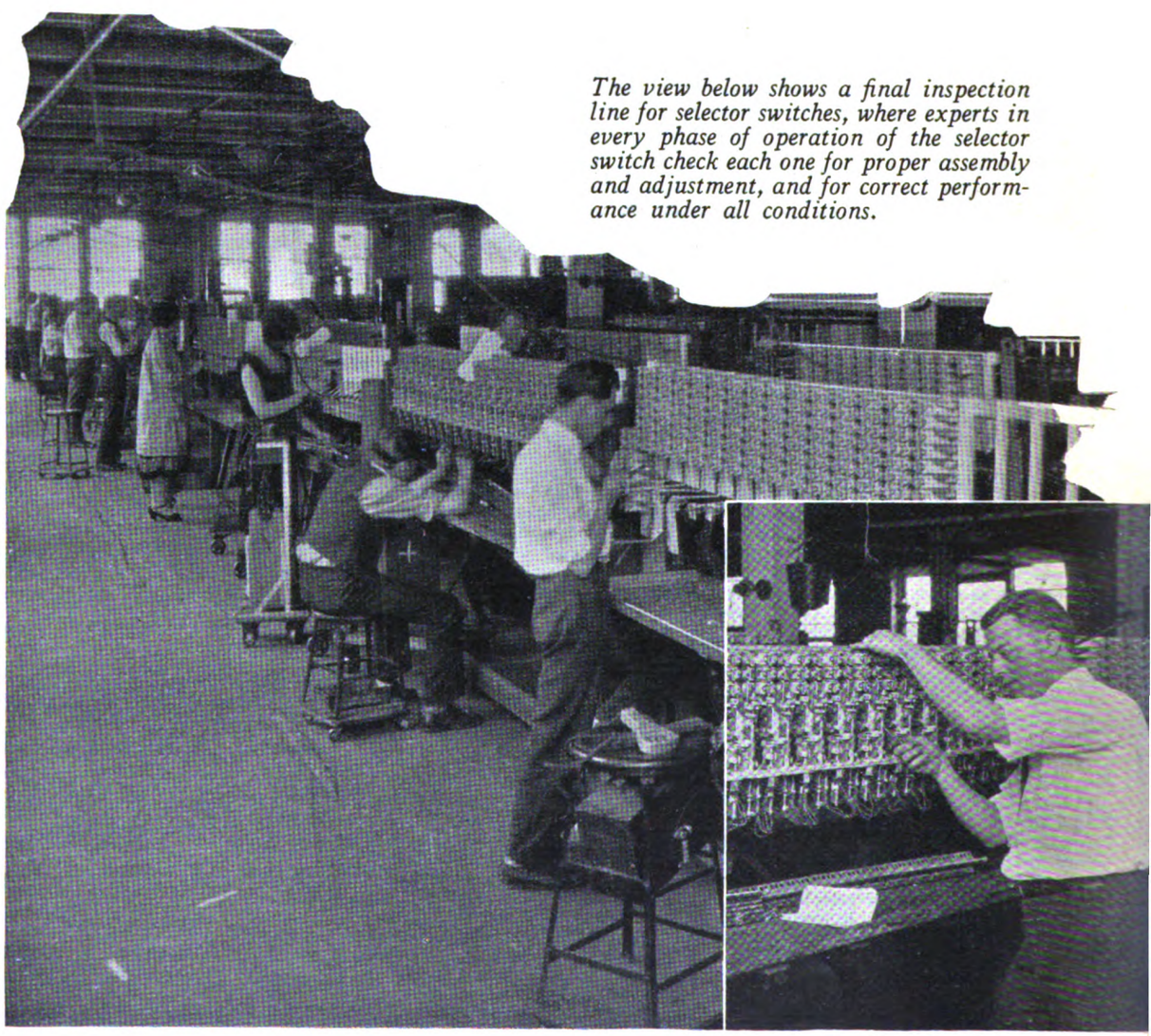
Maintaining Strowger

Through Exactin



The view below shows a final inspection line for selector switches, where experts in every phase of operation of the selector switch check each one for proper assembly and adjustment, and for correct performance under all conditions.

STROWGER

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utomatic Supremacy—
pection Methods.

EVERY step in the manufacture of Strowger Automatic telephone equipment, from the raw material to the finished product, is subjected to the constant supervision of experts and every unit must pass successive inspections designed to reveal the slightest flaw in material, construction or operation. The final inspection line for selector switches here illustrated is the last step in a long series of tests which definitely insure every part going to make up each individual switch to be virtually perfect from every standpoint.

The high reputation for performance, dependability and long life which Strowger Automatic equipment enjoys to-day is the result of the thorough system of inspection which has been maintained by Automatic Electric Inc. from its earliest days, and the exact control of quality which has been insisted upon at every step in manufacture. That Strowger Automatic equipment has always been in advance of the telephone art is due largely to that spirit of insistence which demands the best in every phase of its development, its production, and its installation.

[*This is one of a series of advertisements illustrating the exacting care exercised in the production of Strowger Automatic telephone equipment, which is thus kept constantly in advance of the telephone art.*]

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The
Telegraph and Telephone Journal.

PUBLISHED MONTHLY IN THE INTERESTS OF THE TELEGRAPH AND TELEPHONE SERVICE, UNDER THE PATRONAGE OF THE POSTMASTER-GENERAL.

Editing and Organising Committee - - - J. STUART JONES. W. D. SHARP. J. F. STIRLING. W. A. VALENTINE. J. W. WISSENDEN.

Managing Editor - - - W. H. GUNSTON.

NOTICES.

As the object of the JOURNAL *is the interchange of information on all subjects affecting the Telegraph and Telephone Service, the Managing Editor will be glad to consider contributions, and all communications together with photographs, diagrams, or other illustrations, should be addressed to him at the G.P.O. North, London, E.C.*1. *The Managing Editor will not be responsible for any manuscripts which he finds himself unable to use, but he will take the utmost care to return such manuscripts as promptly as possible. Photographs illustrating accepted articles will be returned if desired.*

VOL. XV. DECEMBER, 1928. No. 165.

THE MARVELLOUS AND THE FAMILIAR.

THE proverb "Familiarity breeds contempt" is perhaps only a homely expression of the truth that when we have become accustomed to the marvellous, when we have long or close knowledge of the truly great, whether in the world of men or of ideas, they lose their power to excite admiration. We take them for granted, and cease to wonder at them, and, indeed, in the case of the achievements of the human mind, we are apt to forget the stupendous efforts (and the gradual steps) required to bring them to the present familiar perfection. We may instance the electric telegraph. It is only ninety years ago since our telegraph system consisted of a short line from Euston to Camden and another from Paddington to West Drayton. Yet to-day the average man who walks into a telegraph office and hands in a telegram for Dar-es-Salaam, or Delhi, or Demerara, never doubts that it will be delivered there as a matter of course. He does not envisage the difficulties encountered in the laying of the first transatlantic cable, or pause to think of the magnitude of the task of constructing an overland line through Russia, across the Caucasus and over Persian deserts to India. He may, indeed, realise that all great enterprises required troublesome pioneer work, and is content to leave it at that. Hence it is, perhaps, that the too familiar telegraph excites at the present time less interest than the telephone. It is true that the public have long ceased to wonder that they can pick up a receiver and listen with ease to a correspondent in Edinburgh or Exeter. That, too, is now taken as a matter of course. But they are not yet thoroughly familiarised with the idea of speaking over a large part of the world. It is not long since that overseas communication was confined to a few places in France and Belgium. But the thermionic valve and the radio telephone have changed all that. Subscribers can now speak to the principal places in both North America and the greater part of Central, Western, and Northern Europe. The average telephone subscriber, however, is only beginning to realise this. The fact that he can hear Berlin as clearly as Brixton is still a theme for wonder. He does not yet take it as matter of course that he should be able to ring up any town on the habitable globe. He knows that the area of communication is still circumscribed and each addition to it is a piece of news and a matter of interest. To-day Milan and Genoa may be added to the list, tomorrow it may be Warsaw or Helsingfors, and time will doubtless bring Belgrade, Bucharest, and Constantinople within the circle. Perhaps at some future day, when wireless telephony has surmounted all obstacles, and subscribers in London can ring up friends connected with exchange telephone systems at the Antipodes, an air of universality or everyday-ness will invest the long-distance telephone, and men will cease to wonder at the phenomenon of speaking over thousands of miles without even the aid of wires except on the local systems. We may be inclined to cry: *Sic transit gloria mundi*, but happily if the wonder departs the usefulness remains. The true glory was the inventors' and the pioneers'; it is to their greater glory if their invention becomes one of the indispensable commonplaces of civilisation.

MOTOR CARS AND TELEPHONES.

THE motor industry and the telephone industry have little in common. Nevertheless we always peruse with interest the annual sent to us by the Motor Industry of Great Britain, because there happens to be a fairly close relation between the number of telephones and the number of motor vehicles existing in some of the more progressive countries. In this country, for example, there were in 1927 1,204,075 motor vehicles (excluding cycles) to 1,633,802 telephones; in the United States 23,253,882 motors to 18,523,000 telephones, in France 976,646 motors to 883,406 telephones, in Canada 932,540 motors to 1,265,869 telephones, and in Australia 448,101 to 461,715. In Germany, however, there is no comparison between the respective figures, there being 2,814,996 telephones to 384,709 motor vehicles. As might be expected, in Scandinavia also the telephonic development is well ahead, Sweden having 466.7 thousand telephones to 109.5 thousand motor vehicles, and Denmark 319.5 thousand to 87.7 thousand.

Except in the United States and France, it will be noticed that the development of telephones is well in front of that of motor vehicles.

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HIC ET UBIQUE.

THE total number of telephones in Canada is reported as 1,265,869 at Dec. 31, 1927, a gain of 61,117 over a year ago. The average of the Dominion is 13.19 per 100 of population against 12.73 at the end of the previous year.

Ontario has 561,043 telephones in service, which is more than 17 per 100 of population. British Columbia, with one-sixth of Ontario's population, has 108,556 telephones, which is almost one to every five persons. Quebec's percentage of telephones is one to 10 and the Maritime Provinces still lower. The Yukon, with 200 telephones, has a percentage of 5.76.

On Nov. 2 a second "through" Anglo-Swedish telephone circuit was opened between London and Malmö. It will be used chiefly to carry the traffic to Norway and to the southern and western parts of Sweden.

"Lubo" wrote recently to the *Evening Standard*:—

> "Sir,—Many taxpayers will doubtless rejoice to have read in the *Evening Standard* the ingenuous admission of a Post Office official that the phenomenal increase in the transatlantic traffic is "due in a great measure" to the reduction (by 40%, it should be noted) of the original tariff charges.
>
> "One is encouraged thereby to hope that this remarkable revelation of the operation of economic laws may possibly receive the attention of other branches of this great public department."

The "ingenuous admission" and "remarkable revelation" are priceless as an effort at sarcasm. "Lubo" seems to infer that because a £15 transatlantic call can be reduced to £9, a 40% reduction of the charges for other services would be justified. We can assure him that the operation of economic laws which would result from selling ordinary telegrams and telephone messages below cost price would *not* rejoice the taxpayer in the least. On the contrary!

According to the *Daily Telegraph*, "the installation of an automatic system at one of the big Paris exchanges, although it has been generally hailed as a welcome move in the direction of modernising the French telephone service, has not satisfied everyone concerned, a
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It is difficult to discriminate nicely between the proportions of conservatism, sentiment and susceptibility (in the gallant sense) which make up this lament!

An enquirer in the *Jewish Chronicle* having raised the question whether it is lawful to use the telephone on the Sabbath day, a correspondent writes:—

> I. H. H. may be interested to know that a similar question was raised 206 years ago.
>
> In his *Responsa*, printed 1722, par. 31, Rabbi Jacob Reischer, of Prague, addresses the following question to his brother-in-law, Rabbi David Oppenheim:
>
> ". . . . . and particularly with regard to the special instruments whereby one is able to speak and listen to his friend at a distance of many many miles; should such a thing be forbidden on the Sabbath Day? We have never heard anybody query this matter!"
>
> Considering that the telephone dates back to about fifty or sixty years only, the above is a most remarkable pronouncement. What sort of a telephone was it that the Rabbi mentions, and where and in what Jewish Community did it exist?

This sounds remarkably intriguing. In the following week's issue of the *Chronicle*, however, another correspondent seeks to dispel the vision of an early eighteenth century telephone by a quotation from another *Responsa* which he translates: "there must have been an apparatus (probably a tube) the use of which incurred no breach of the Sabbath."

But by what tube could one speak to a friend "at a distance of many, many miles"? We do not consider the mystery solved, and we should be glad to learn what sort of forerunner of the telephone could have existed or what mysterious black art was practised at Prague in 1722 which would enable one to do so.

This is a true story, though we confess to having not only omitted the name of its subject, but altered his Department and the local details in order to conceal his identity. Mr.——, of the London Postal Service, situated in King Edward's Building, has never succeeded in accustoming himself to the use of the telephone. He is heard indistinctly because he speaks too loud; and finding himself inaudible speaks louder still. A visitor to the building, hearing a frightful noise from within his room, enquired the cause, and was answered, "Oh. that's Mr. —— talking to Mount Pleasant." To which the visitor retorted, "Well, why the deuce doesn't he use the telephone?"

During the past month the transatlantic telephone service has been extended to Vienna, Budapest, Prague and to all parts of Spain.

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CHANGES AT THE CENTRAL TELEGRAPH OFFICE DURING THE LAST FIFTEEN YEARS.*

BY MR. J. STUART JONES, CONTROLLER, CENTRAL TELEGRAPH OFFICE.

EXACTLY 15 years ago this month Mr. John Newlands, then Controller of the Central Telegraph Office, gave an address to this Society on the methods and results of the Telegraph Service, and, when the call came to me to read a paper to you, it seemed to me that it might interest you, or some of you, if I attempted to describe the changes which have occurred in the Central Telegraph Office in the intervening 15 years, especially as these changes are, in many cases, representative of what has happened in the other large offices of the British Telegraph Service. I do not place the possible attractions of such a paper at a higher level than that of interest because I am doubtful whether retrospects in the Telegraph Service, as in private life or in other fields, are fruitful of much good in the way of instruction for future guidance. The problems of to-day are never the same as those of yesterday, and the interest of a survey of past years lies mainly in discovering the places where we seem to have gone wrong and the places where we seem to have kept the right road.

Mr. Newlands, in his address, not only described the methods of operation and the results obtained in the Telegraph Service at that time, but gave a short review of the development of the Service since it became a State monopoly in 1870. To those telegraph men and women with an historical bent I commend a re-reading of Mr. Newlands' address. It is full of interesting matter and suggestions prepared with the thoroughness of detail and urged with the force which characterized Mr. Newlands in 1913, and, I am glad to think, still characterize him.

The changes in the apparatus employed and in the routine practices of the Inland Telegraph Service in the 43 years between 1870 and 1913 were very considerable. The various types of apparatus which had been in use in the early days, such as the single and double needles, the double-plate sounder, the A.B.C. and others, had given way to a standard method of operation by morse sounder, except in the case of news wires which were operated by Wheatstone automatic apparatus. Here and there in 1913 an A.B.C., and even a double-plate sounder, might still be found, but except for eight routes which were worked on the so-called "continuous" Wheatstone system, for a solitary Baudot between London and Birmingham, for three routes worked by Hughes apparatus and for two Murray installations, one automatic and one multiplex, and the news wires, the morse sounder held the field. The Inland Telegraph Service was essentially a hand-operated system.

The pre-eminence of Morse during these years was not unassailed. On the contrary, the period was fruitful of telegraphic invention, and while many of the systems tried failed to withstand the test of commercial operation, there emerged two clear and distinct lines of promising development, the use of a five-unit alphabet with multiplex transmission and the application of typewriter keyboards to telegraph purposes.

While, therefore, the 40 years prior to 1913 saw a very real advance towards the standardisation of Morse sounder and Wheatstone apparatus, there were signs towards the end of that period that their position was not impregnable. Donald Murray had abandoned his automatic system in favour of multiplex, Baudot multiplex was attracting attention in this country, while Creed, with Kotyra, Gell, and others accepting the Morse alphabet as a basis, sought to modernise telegraphic methods by means of typekeyboard perforation and automatic printers.

At the C.T.O. the Murray automatic, which was a high-speed five-unit system, had been tried successively to Edinburgh, Dublin and Leeds before being abandoned. Later a four-channel multiplex, also devised by Donald Murray, was tried between London and Manchester and proved to be the pioneer of automatic multiplex now becoming standardised in this and other countries. The Baudot multiplex, that ingenious system invented by a French telegraphist and perfected for commercial use as far back as in 1877, did not, strange to say, get a trial in the British Inland Service until 1910, although it had been in use on circuits to the Continent for at least 12 years previously. It suffered perhaps from the fact that in its original form it was arranged for simplex working only, but in 1905 Lt.-Col. Booth devised a method of duplexing the system, an improvement which made its claims for consideration irresistible. Accordingly, in 1910 a quadruple and later a sextuple duplex circuit was installed between London and Birmingham. Mr. Newlands was immediately converted to multiplex, and in his paper he made a strong recommendation for the extension of Baudot working in the Inland Service, stating that it would revolutionize the Service.

At the same time the evolution of Wheatstone working had led to the provision of typekeyboard perforation by means of Gells and the reproduction and printed translation of received signals by means of Creed apparatus.

The Morse alphabet was making a fight to justify its position, and it became evident that the British telegraph administration would have to make a momentous choice so that a settled policy of development could be followed. In 1914 a committee was appointed under the chairmanship of the Assistant Postmaster-General, at that time, Captain Cecil Norton, to "enquire into systems of high-speed telegraphy and to report thereon."

They took great pains over their inquiries, and their report, which was not published until 1917, was definitely in favour of five-unit multiplex, as against the Wheatstone automatic system.

Having determined the policy to be followed, the exigencies of the war produced the opportunity for rapid development. Baudot multiplex circuits were rapidly installed on the routes from the C.T.O. to Birmingham, Leeds, Glasgow and Liverpool, and were followed by others during the war until 14 of the main routes had been equipped.

Excellent though the Baudot system may be, in some respects it suffers from the fact that it was invented in what may be called the pre-typewriter period. Its five-tapper key is an anachronism in a modern telegraph service rapidly developing typekeyboard transmission, inasmuch as it demands manipulative skill which cannot be employed on any other machine and it limits operating speed to 30 words a minute, which involves the loss of valuable line time. To eliminate these weaknesses Donald Murray conceived the idea of keyboard perforation of tape which would pass through a transmitter at a higher rate of speed. He also devised a five-unit code, better suited for typekeyboard use, which is now extensively employed.

Although his original double-duplex installation on the C.T.O.-Manchester route did not survive, it and his later improvements of his system showed the advantages of typekeyboard perforation over the direct-sending system of the original Baudot. The Americans were quicker than we were to realise the advantages of Mr. Murray's system and the Western Electric Company produced a typekeyboard page-printing system, fundamentally based on Mr. Murray's. Equipment of this type was installed on the C.T.O.-Manchester route in 1916. Its rate of working is 40 words a minute per channel and it is still in successful operation. It may be remarked here that the American telegraph companies, having recognised the advantage of typekeyboard operation, never introduced the Baudot in its original form. Improvements have been made in the perforators and in the printers, and at the present time multiplex apparatus is in general use in America, working with extraordinary stability at rates varying from 45 to 60 words a minute.

Unfortunately, we in this country had not the clear vision of the Americans in the matter of typekeyboard operation for multiplex circuits, but during the last few years substantial progress in this direction has been made. Lt.-Col. Booth and Mr. Willmot, of the Stores Department, designed a typekeyboard perforator suitable for Baudot installations, and several installations have been equipped with these keyboards. At the present time 37 of the main telegraph routes radiating from the C.T.O. are operated on the multiplex system, and of these 11 circuits are equipped with keyboard perforators and automatic transmitters. There are in addition two Western Electric installations, the second Western Electric installation being made on the C.T.O.-Manchester route in 1919.

A further development of recent years has been the production of the so-called Start-stop printing telegraph machine, which we have decided to call the teleprinter. It, like the multiplex, uses a 5-unit code. It provides the advantages and speed of typekeyboard signalling and type printing, and its use is being rapidly extended on circuits hitherto equipped with morse quadruplex and duplex apparatus. In the C.T.O., 30 circuits are now equipped with teleprinters, 23 being operated by Morkrum, 2 by Kleinschmidt and 5 by Creed machines.

In the general result, the traffic of the C.T.O. is at present handled to the extent of 40% by multiplex, 40% by Morse sounder, 9% by telephone, 7% by teleprinter and 4% by Wheatstone and other instruments.

The effect of the introduction of printing telegraph machinery on the manipulative operator output of the C.T.O. has been considerable. In his paper Mr. Newlands gave the manipulative output at that time, over the period from 8 a.m. to 8 p.m. daily, as 21 or 22 telegrams per hour. At the present time it is 27. These figures are not strictly comparable, because the earlier figures include the phonogram traffic, with its comparatively low output, and the later figures do not, but a correct comparison would show an increase in the output of about 20%. I believe the improvement is regarded in some quarters as disappointing, but it has to be remembered that there is still much morse operation and also that the benefits of the improved machinery accrue mainly during the peak hours of pressure and cannot be fully realised during the less busy hours when traffic is low.

Prophecy is often in after years a disconcerting thing to the prophet, and I will not attempt to forecast future development beyond saying that, in my opinion, typekeyboard perforation will rapidly supersede the direct-sending of the Baudot, that there will be a considerable extension of teleprinter operation at the expense of morse and that page-printing on multiplex and teleprinter will disappear.

Printing telegraph machines have, of course, brought their own difficulties. It is not easy to determine the types best suited to our requirements, but we have erred, I think, in not making up our minds quickly enough as to the machines which we intend to adopt as our standard apparatus. Different types of apparatus with different methods of operating and different requirements in the matter of maintenance put a strain on a telegraph office, and every effort should be made towards securing as great a measure of standardisation as possible.

* Paper read before the Post Office Telephone and Telegraph Society of London on Nov. 19, 1928.

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Another source of much difficulty is the instability of the apparatus. This instability is certainly not inherent in printing telegraph machinery. In America multiplex and teleprinter services are as stable as morse services, and either our machines are not sufficiently well designed or constructed or our methods of maintenance are imperfect. Whatever may be the cause, it is imperative that the remedy should be sought as a matter of urgency, for stability is the most pressing need of the Service at the present time.

Fifteen years ago, according to Mr. Newlands, the average day's work of the Central Telegraph Office ranged from 220,000 to 250,000 transactions. At present it is about 200,000 transactions, a reduction of from 10 to 20% according to which basic figures are taken. In 1913, however, the Cable Room dealt with 25,000 telegrams daily; it now deals with 35,000. In the 15 years, therefore, the Inland traffic has fallen from, say, 200,000 transactions or a little over that number, to 165,000, a reduction of about 20%.

Since the war the establishment of private wire systems by the Press Association and the Central News has taken much news traffic from the Central Telegraph Office. This is illustrated by the fact that in 1913, the staff of the News and Special Sections numbered 356 men and at the present time numbers 210. The sections, moreover, now include certain lines which they did not have in 1913, and the actual comparable number is about 200.

Substantially, the arrangements for the distribution of news traffic have not altered in the past 15 years, apart from a reduction in the number of news wires due to the fall of traffic.

In these 15 years telegraph traffic has passed through some vicissitudes. During the war, after the first months of great pressure, the traffic fell to a point much below the pre-war level. Immediately after the war, a trade boom, which unfortunately proved to be short-lived, raised telegraph traffic to an unprecedented level. Since 1920 there has been a gradual decrease of inland telegraph traffic and, unfortunately, there is not as yet any sign that this decrease has been arrested. As you are aware, the causes of this decrease and the possible remedies to counteract it have been much discussed, and I do not propose on this occasion to touch upon what is a very controversial subject.

Mr. Newlands told us in 1913 that the C.T.O. staff at that time numbered 2,431 men and 1,100 women, a total of 3,531. That number did not include learners, girl probationers, messengers or tube attendants. The comparable numbers at the present time are 1,890 men and 1,200 women, a reduction of 541 men and increase of 100 women. The composition of the male staff has, however, altered. The male staff of 1913 included 399 men on the Cable Room establishment. That establishment now includes 835 men. The number of men on the inland establishment is now 1,012, as compared with almost double that number in 1913.

I may remark here, as a slight alleviation of the dark picture presented by the reduction of the male inland staff, that the proportion of supervising posts to male telegraphists in 1913 was as 1 to 5.3, while on the present establishment it is 1 to 4.7.

In 1913 the total staff, including all grades, was 4,529. The present establishment is 3,972, a reduction of 557 as compared with 1913.

The reduced figure of inland traffic and inland staff may present a gloomy picture, but there is a lot of activity left in an establishment of over 3,000 people.

For many years one of the outstanding features of the office was the inter-communication switch. By its means any Metropolitan office served by a sounder circuit which had a telegram for a London address could be placed in direct communication with the office of delivery, thus avoiding retransmission in the Central Telegraph Office. It was operated in much the same way as a telephone switchboard, apart from the fact that all communications were passed in Morse, and for its purpose it was very efficient. When it was installed in 1903 the number of telegrams handed in at Metropolitan offices and destined for addresses in the Metropolitan area was about 26,000 daily. The telephone service, however, grew so rapidly as to become not only a rival, but a successful rival, for local communications, and the traffic passing through the inter-communication switch gradually fell to a level when it was no longer economical to maintain the switch. It was removed about two years ago and all purely local telegrams in London, of which there are now probably not more than 1,500 or 2,000 daily, are passed direct between office and office through the medium of the telephone system.

About three years ago a new type of concentrator switch was installed for Metropolitan offices which collect but do not deliver telegrams. With this type, which is known, in default of a better term, as the "ancillary" switch, the circuits are led direct to and are multipled on several units, so that a call may be answered at any one of several positions. This arrangement ensures greater availability of staff and provides a speedier service than with the distributor type of concentrator switch. It eliminates the distributing operator of the older type of concentrator and it is an unqualified success for the work to which it is put. How far it would be successful where traffic passes both ways, that is to say, if offices connected with it were delivery as well as collecting offices, is doubtful. If an office were forwarding a telegram to the C.T.O. and the C.T.O. had a telegram for that office, it would be difficult readily to ascertain at which of the several positions the office was engaged and telegrams might get badly delayed in consequence. I do not think that this difficulty is insuperable. It might be met, for example, by some alteration in the design of the switch or by a special lay-out of the wires. At all events, it seems to me that switches of this type, though possibly considerably modified, will eventually supersede the distributor type of concentrator.

In 1913, Mr. Newlands mentioned telewriters. They do not form an important part of the machinery of the Central Telegraph Office, although visitors to the office find them one of the most interesting of our exhibits. At present there are only 10 telewriters as compared with 33 in 1913 and, as a form of telegraphy, they are not likely to survive for long in view of the advance of comparatively cheap types of printing telegraph machines.

As regards the pneumatic tube system, the outstanding change of recent years has been the installation of a tube transmitting centre in the basement of the War Office at Whitehall. The traffic of 11 offices in the south-west of London now pass through this tube centre. Prior to the installation of the tube centre, the work of 10 of these offices was transmitted by morse.

At the C.T.O. the terminals of the pneumatic tubes are divided, some terminating in the Central Hall and others in the Centre Gallery on the third floor. Arrangements are being made to terminate all incoming tubes in the Centre Gallery, and it is the intention that the outgoing tubes shall be associated more closely than they are at present with the delivery room.

Since the war the delivery service has been organised on what is known as the Walk system. The system has been rather severely criticised and the impression has been created that before it was introduced a messenger was always waiting to take out each message as it reached the delivery room. That impression is entirely incorrect. To have a messenger in waiting for every telegram as it arrived would be hopelessly extravagant, and the general practice during the busy hours was to send messengers out with small batches of telegrams for the same neighbourhood. Under the walk plan an organised system replaced an unorganised one. In principle the plan is sound, and the general delivery arrangements were unquestionably improved, but there may be weaknesses in the application of the system. Indeed, I may say that in my opinion the interval between deliveries on the same walk is in some cases rather too long. I was interested to find that in America the delivery was arranged on what was practically a walk system.

A change in connexion with the delivery system has been the introduction of stencilling appliances for the preparation of envelopes for telegrams to registered abbreviated addresses. The system is both economical and speedy.

The stencilling system is also used for the preparation of the copies of multiple telegrams.

The section of the Central Telegraph Office which has seen the greatest increase during the past 15 years is the Phonogram Room. In 1913 the average day's traffic was about 3,500 messages, the number on the busiest day being 6,000. At the present time the average day's traffic is 15,000 messages, and the maximum number dealt with on any one day was 20,000, last Christmas. Of the 15,000, about 4,500 are telephone-telegrams, i.e., telegrams passing between the Central Telegraph Office and other telegraph offices which are served by telephone, the remainder, over 10,000, being phonograms, i.e., telegrams received from or delivered to telephone subscribers.

In 1913 the phonogram work was done by telegraphist staff. To-day it is done by telephonist staff, the establishment of the room numbering 295.

Until about two years ago all incoming traffic was distributed to the operating positions through the medium of a switchboard, but 18 of the 190 incoming, or receiving, positions are now given up to what is called an "ancillary" switchboard. Incoming circuits from telephone exchanges are led direct to this switchboard and multipled in such a way as to permit each of the 18 operators to have immediate access to all of the incoming circuits, that is to say, the distributing operator is eliminated. The results of this switchboard are very satisfactory. With the same operator load as at the positions served through the distributing switchboard, a quicker service is given to the public, or, if the same quality of service is given, a higher output per operator is obtained.

A new phonogram room is in contemplation, and it is likely that it will be equipped with ancillary apparatus, though not necessarily of the same design as the existing switchboard.

A special feature of the phonogram room is the belts under each table for carrying messages from the point of reception to the circulation table. They are a valuable aid in expediting the handling of the messages, and I expect that there will be a considerable extension of this system of collection in the future throughout the office.

In the past 15 years, much has happened in the Cable Room. In 1913, when only lines to the Continent were worked in the Cable Room, Hughes was the predominating machine, 47 circuits being worked by Hughes and 9 by Baudot. In the intervening years the number of circuits worked by Hughes has fallen to 26, while the number of Baudot installations has increased to 30. In the number of working channels, the difference is much greater, there being 65 Baudot channels to 31 Hughes channels.

The Siemens has been introduced since the war and the routes to Berlin and Oslo are now operated by that method. Until after the war, the Cable Room dealt only with telegrams passing between Great Britain and the Continent over the cables crossing the Channel and the North Sea. Since the war its activities have been widely extended. The Imperial Cable to Halifax, Nova Scotia, which on its opening in 1917 was operated by the Inland establishment, was transferred to the Cable Room in 1921, and a second Imperial Cable was acquired in 1922. In the past two years the beam wireless services to Australia, Canada, India and South Africa have been opened. Several wireless services to Continental towns have also been introduced and the Cable Room is in communication through the Rugby radio station with ships on the high seas throughout the world. In May,

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1926, the cables to Norway, which up to that time had been operated by the Gt. Northern Telegraph Company, were transferred to the Cable Room.

The Cable Room is now connected by wire with 32 Continental towns, including eight towns in France and seven in Germany. The Threadneedle Street branch office has direct communication with the Bourse offices at Paris, Brussels, Amsterdam and Berlin. The Cable Room has direct wireless services to five Continental towns, with which it is not connected by wire, viz., Warsaw, Bucarest, Danzig, Budapest and Hapsal. It has supplementary wireless services to two towns, Milan and Prague, with which it is also connected by wire.

There is also a wireless service from the Cable Room to Halifax, Nova Scotia, for the transmission of Press messages, and a wireless service has been established within the past few months to Nairobi in the Kenya Colony.

The Cable Room also receives, by wireless, Press messages from Denmark, Finland, Sweden and France.

Experiments are at present being conducted in the transmission of pictures between the Cable Room and the Continent over cable wires. There is, I think, a field for picture, or facsimile, telegraphy, though it seems unlikely that that field will be as extensive as the sponsors of that system think it will be.

About 35,000 telegrams pass daily through the Cable Room, mainly telegrams of a difficult nature, couched in foreign language or in code.

I have already mentioned that in 1913 the Cable Room traffic amounted to about 25,000 messages daily. The difference between the two amounts is practically accounted for by Imperial and Empiradio traffic, and the quantity of Continental traffic, therefore, stands where it did 15 years ago. The position, however, is worse than a stationary one, because in the meantime the Cable Room has acquired the Norwegian cables. Leaving Norway out, there has been a definite drop in the quantity of Continental traffic handled by the Post Office. This decrease is no doubt due to very active wireless competition. Apart from the Marconi services between England and several Continental countries, many, indeed most of the Continental countries have now direct wireless services to America. Wireless competition is sure to become increasingly severe as time goes on, and special attention will have to be given to the cable service if it is to hold its own.

It looks as if the Cable Room has reached its zenith as regards size. In the near future it will lose the Empiradio services and the Imperial cables, and, as members of the Post Office staff, we cannot help regretting the loss of services which we have organised and operated, we are entitled to think, efficiently and successfully, having regard to the large measure of public support which they have attracted.

This concludes my brief review of the changes which have occurred in the Central Telegraph Office during the past decade and a half. I could have extended it considerably, but I did not want to bore you with a multiplicity of detail. The changes have been of a revolutionary character. New machines, new methods and new standards have been introduced and much aptitude has been shown by the staff in equipping themselves to meet the altered conditions of their work. It is not surprising that some of the changes have been received with criticism and at times with resentment by the staff. It is impossible in such a large office to keep the staff fully informed of the reasons and the policy which lie behind the individual changes, but at all events the staff have always done their part in giving the new machines and the new methods a fair trial. They have had to do their work during the past three or four years under the difficulties arising from the building alterations, and I feel that I ought to pay a tribute to their forbearance and the cheerful way in which they have carried on.

In the nature of things it is too much to expect that the right thing has always been done and the right decision always been made, but at all events I do not think it is too much to claim that in the main there has been continuous progress in the direction of keeping the telegraph service abreast of modern machine development in the efforts to maintain an efficient public utility.

EFFICIENCY OF BRITISH TELEPHONE SERVICE.

RELATIVE to an editorial in *The Times* of London, criticising the telephone development of this country, the London correspondent of *Telephony*, Chicago, writes in the issue of that journal for Nov. 3 :—

The administration of telephones in Great Britain is kept under a constant fire of such criticism. Letters and articles appear in the newspapers pointing out this or that unfortunate occurrence and drawing the deduction in every case that these occurrences would not appear in a system of private ownership.

In view of the widespread interest throughout the world in this issue, and the desirability of ascertaining to what extent the criticisms of the British system are fully justified, your correspondent has seen E. A. Mellinger, of the International Automatic Telephone & Telegraph Co., and has asked him for his views of the service in Great Britain. Mr. Mellinger has had ample opportunity to judge the British service, both as it is now and as it has been in the last few years, and his opinion carries particular weight.

" In the first place," he said, " it seems to be desirable to point out that the British Post Office appears to be at a disadvantage in being so inarticulate. It does not seem able to make a reply, particularly during the period when Parliament is not sitting; and even when Parliament is sitting it would seem to be difficult for a government department to formulate a reply unless the criticism is passed across the floor of the House of Commons. This has several influences, perhaps particularly in the direction of the inability of the Post Office to appeal to public psychology.

" In countries where the telephones are a commercial venture, the administrations are able to appeal to public interest by various methods of publicity, and such appeals seem to be impossible to a government department ; in fact, it suffers from being a representation of the state at large rather than being the representation of telephone enterprise as a portion of general public utilities. Just so in another sense, it may be said that by having every citizen as its shareholder it suffers from having no shareholders."

" And what do you think," asked the correspondent, " of the position of telephones as part of British Post Office enterprise ? "

" I have no doubt," Mr. Mellinger replied, " that here again the Post Office has its own difficulties. Serving the public throughout the country in so many different ways it would be very remarkable if it did not occasionally come across a jarring nerve which led people to be rather severe in their criticism of other aspects of Post Office work, and the very intimacy of telephones with the public often leads persons discontented on other grounds to visit their criticism on the telephones."

" And what do you think of the quality of service in England ? " asked the correspondent.

" It is a fact that the telephone service in Great Britain is much better than would be gathered by mere judgment of these criticisms," answered Mr. Mellinger. " The underground long-distance lines have now been extended both to the north and to the west, and they gave a service of very high quality. In an area of wide range round London there is a toll system giving an immediate service over a territory much wider than any other similar territory in the world. The development of international telephony, both across the Atlantic and to various countries of Europe, is remarkable."

" The advance in the use of automatic telephony in England has been very rapid in the last few years, and indeed has been surprisingly rapid when one remembers that capital is only forthcoming as a portion of the treasury's inclusive consideration of all sorts of national expenditure, so that it is quite possible that such ventures as conversion loans or housing have a bigger influence upon the amount of capital expenditure on telephony than would be readily understood."

" In conclusion," said Mr. Mellinger, " I would say generally, that it is my personal experience and observation that telephone service in London compares favourably with the service in any other large city of the world. It is equal to the best service given in any comparable area, and superior to most, and the present rate of growth has to be considered in its relation to the quality of service which can be given during the process of expansion."

OBITUARY.

MR. R. A. DALZELL.

WE greatly regret to hear, as we go to press, of the death of Mr. R. A. DALZELL, the late Director of Telegraphs and Telephones of the Post Office. Mr. Dalzell only retired in the summer of 1927.

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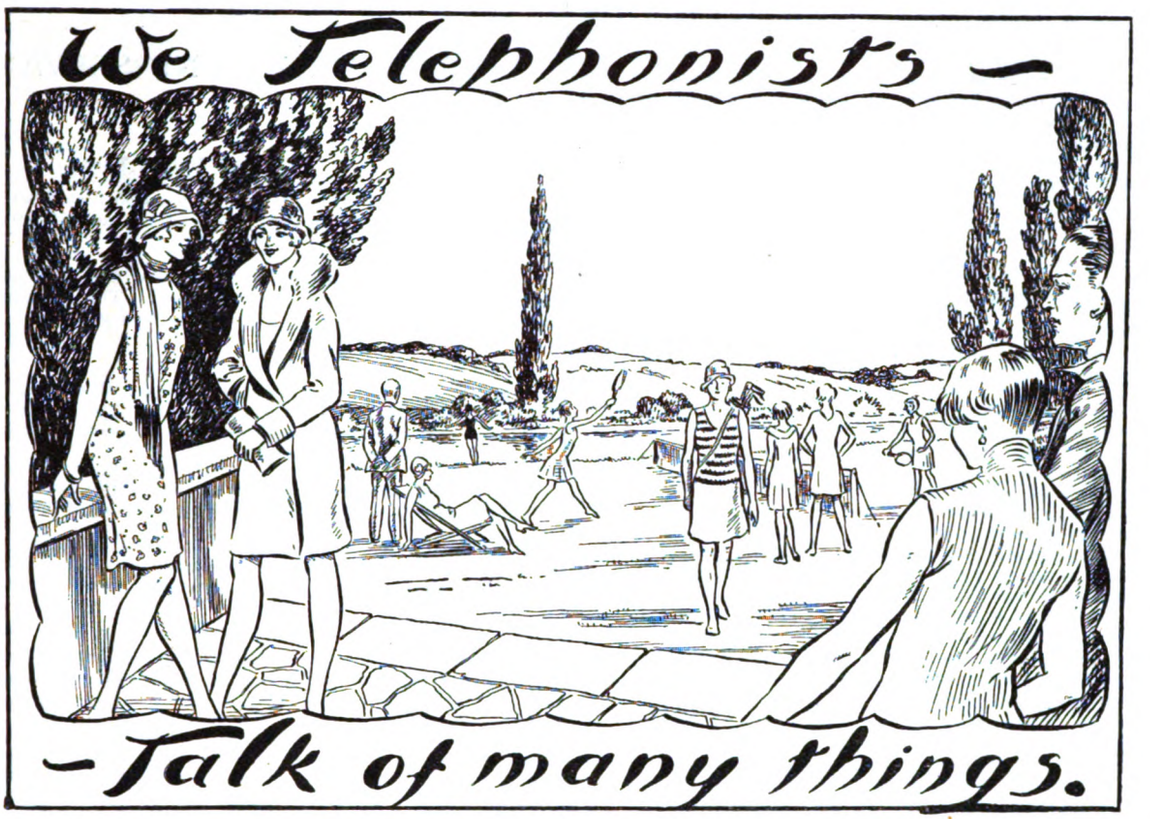

Cats in the Belfry.

IT was rather difficult for me to write because Bindle the Hound had intimated that he desired to go out for a run. He had that irresistible look in his eye and he was asking "What is it master writes so much?" Whenever I put pen to paper he put his nose under my arm and shoved or jumped up behind me and put his red-flannel tongue round my ear. "Look here, Bindle, old man," I said, "can't you see I'm busy? Don't worry." "Well, guvnor," said he, "what *are* you doing?" "I'm writing for the *Journal*," I said, "so go away." "That's the worst of you humans," retorted Master B, "you're always doing stupid, useless sorts of things. Now dogs ——" "Pooh," I said, interrupting him, "what do dogs do—for instance, what do *you* do?" "What do I do!" said he, curling his tail into a question mark, "What do I do!! Well! shiver my gate-post, I like that! What a question! I reckon I've got a most responsible job. You know very well that you couldn't get on without me—and Ye Spratts! what a bother it was to train you. I'll tell you what I do," he continued, and he counted them off on his claws. "I look after you and the missus. I take care of her when you're out and I take care of you when she's in. I take you both out several times a day for the good of your health. I chase burglars away and chivvy the cats out of ——" "Cats," I said. "You've got cats in the belfry." "Oh, bones to that," he replied. "You've got burglars in the attic." I denied the charge testily and pointed out, moreover, that we hadn't such a thing as an attic about the place. "Don't be frivolous," he snapped, and then he suddenly started to laugh silently. "What's the matter?" I asked. He merely shook his head and wiped the tears from his eyes with his paws. "Oh! suffering steaks," he gasped presently, "I was just thinking of the joke I had with you recently." "What joke?" I growled. "Why, when I barked at half-past three in the morning." "That wasn't ——" I began, but he went on, "you did look funny when you tottered downstairs in your pyjamas and poked your head round the door. 'W-w-what's the m-m-matter, B-b-bindle,' you said, 'Is it b-b-burglars?' I nearly burst out laughing, but I managed to let out a fierce growl instead. 'W-w-well,' you said, 'you'd b-b-better g-g-go and see about it.' Of course, it was only old Sandy Cat from No. 6, but out I went with a snort!' 'G-g-good dog,' you said, 'd-d-did you b-b-bite 'em?!' Laugh, I thought I should shake the whiskers off my tail." "Bindle," I said sternly, "do you know what happens to dogs who don't speak the truth?" "No," he replied, "I don't; neither do you, because dogs always speak the truth." "Well, yes," I said, "I believe you're right." "By the way," he said, suddenly changing the subject, "those pyjamas of yours seem to be on their last legs; what about letting me have them for my basket?" "Um, well," I said, reflectively, "I shall have to think about that." "I've rather taken a fancy to them," he went on, "they remind me of streaky bacon—more streak than bacon." "And now," he said, "it's time for your walk. Listen, the wind is in the trees, the leaves are chasing each other like so many pups, the air is sweet and good, there's grass under foot and wide sky overhead and the birds are calling us. Oh, come on, guvnor." He nosed my hand gently, gazed at me with eyes eloquent in appeal, licked me softly and wagged his tail coaxingly. I went, and he was right. Once out, he was of opinion that it would be perfectly stupid of me to return to finish this article. Perhaps he was right again.

PERCY FLAGE.

Something to Look Forward To.

There are those who regard thirteen as an unlucky number, and again there are those that regard it as lucky, and for the future the writer will be found amongst the latter group. The reason is simple—the thirteenth of November found me at the Institution of Electrical Engineers, where, as I was informed, a lecture was to be delivered before the Institution of Post Office Electrical Engineers by Mr. Peck on the subject of "The Director Exchange in Practice." Mr. Peck is, as everyone knows, a lecturer who makes himself master of his subject, and is therefore able to convey to his hearers clearly and succinctly the points he wishes to make, and he has moreover that greatest of virtues in a lecturer—the ability to speak so that he can be followed without effort. Nevertheless, it was with something of a shock that on arriving slightly before the advertised time for the start of Mr. Peck's address I found every seat in the hall taken and the standing space packed five or six deep. After standing for an hour and a quarter listening to an appraisement of the Director System and mentally struggling to reconcile it with such experience as I had of the device, piecing together the while a few comments to be voiced should opportunity offer, I suddenly realised that the Chair had a new occupant—Colonel Purves—and that the whole gathering had risen as one man the while an elderly gentleman, tall and upstanding, with white hair in abundance, and kindly, merry eyes, took his place at the reading desk. Colonel Purves introduced him as Dr. THOMAS WATSON, but to those of us who had read his autobiography, "Exploring Life," he needed no introduction. No wonder this gathering of telephone men did him homage, for, as Colonel Purves pointed out, Dr. Watson as a young man made the first telephone, put up the first telephone wire, and heard the first words ever uttered through a telephone—the original producer of the instrument, the development of which, as the Chairman happily expressed it, had enabled us to secure our bread and butter—though "very little butter." Had he fully appreciated the presence of traffic representatives he would probably have added margarine or dripping!

Well, Dr. Watson told us the story of his association with Graham Bell and held us spell-bound for over an hour. The subject matter of his address may be found almost *in extenso* in his autobiography, and will also, as I understand, appear in the next issue of the *Journal of the Institution of Post Office Electrical Engineers*, and need not therefore be given wholly or in part here; but something must be said of its manner. The Doctor's voice was never raised, and yet he was heard perfectly at the very back of the hall, his speech was musical and expressed every shade of feeling, grave or gay, so that it was a veritable sorrow when his address came to an end, and the hall cleared slowly as if the audience yet hoped to hear more. And although there were no telephonists at that meeting and Dr. Watson has now left to winter in

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Africa, they are to have an opportunity, if all be well, to see and hear the Doctor when he returns home to America via London in the Spring, for he has, I am informed, consented to speak at a meeting of the London Telephonists' Society. He had a real welcome at the meeting of the Institution of Post Office Electrical Engineers, but I feel sure his greeting will be at least as warm and wholehearted when he comes amongst the telephonists. Of this, at any rate, I am sure, that if alive and well, though I have to stand for more hours than on the last occasion, he will have amongst his audience of telephonists one who has heard him already and would willingly go anywhere to hear him again.

H. D.

Ravensbourne.

A Sale of Work was held in the Sitting Room of the above exchange on Oct. 20, 1928, in aid of the Elizabeth Garrett Anderson Hospital Fund. The proceeds amounted to £25.

A most successful sale,
Which makes all former efforts pale,
Was organised with great effect,
By a quartette elect
Of willing workers, who,
To our chagrin, made us work, too.
They made us so enthusiastic
We wished our purses were *elastic* !
Such things to tempt us !
Sweets, made by fair hands
That erstwhile held a handset !
Flowers and ferns just fit for Kings,
And there were dainty 'textile' things
That suit the average purchaser, and lest
The owner of a hope chest,
Be forgotten, useful things,
And even serviettes and rings !
All this was in the Sitting Room.
Upstairs, the way to which, 'twas said
Was shown by tape, the usual shade of red,
Were more attractions :—
A baby doll, whose name we guessed,
A cake, its weight we did proclaim,
And sweets, the number we did claim
To know, but all in vain,
The prize, it was not ours to gain.
And then for those whose care
It was to know the future, a lady fair
Did hold *her* court.
And, putting first things last, in our belief,
The best of all was just to have the Chief
To open the bazaar.
The proceeds, as you know,
To the E.G.A.H. fund will go—
£25 ! and more to follow,
For our small box—it was not hollow
Long, and week by week we place our pence
In its wide mouth, with hope intense
That we may never need such help,
Yet gladly *give*.
The proceeds seem quite good, although we're small,
And only outer London after all !

C. D.

London Telephonists' Society : Second Meeting of Session.

Et tu, our Percy Flage ! How could you do it ! By now, methinks, you have begun to rue it. To stand before us, in such heartless fashion, barren of faith, devoid of sweet compassion, with such a theme, soulless and unmajestic—to wit—that "We Teléphs." are not domestic. How seared and scorched our souls ! till, of a sudden, our champion arose "Née(omi) Budden." Dear Mrs. Herbert, how you thrilled and cheered us, as skilfully amidst the rocks you steered us. You told us how your service here had taught you, how there to manage what blind fate had brought you, as in that sphere, you said (no voice demurring) you found most things, like history, recurring. Thus, when you reached the front door at the double, 'twas but to find, once more, "wrong number" trouble. And when for bed HE showed a predilection, you used again a somewhat raised "inflection." When, too, for ancient jokes he had obsession, you kept, *in tact*, your "authorised expression," and though with little cares each day is packed full, you're always "speedy," "accurate" and "tactful." Thus of your *bona fides* quite persuaded, we rose in wrath and Percy Flage upbraided, saying "O thankless child of our adoption, our verdict is : Guilty, without the option."

Contributions to this column should be addressed THE EDITRESS, "Talk of Many Things," *Telegraph and Telephone Journal*, Secretary's Office, G.P.O. (North), London, E.C.1.

LONDON TELEPHONE SERVICE NOTES.

Contract Branch Notes.

THE volume of business done by the Contract Branch during the month of October showed a distinct improvement, as indicated by a net increase of 6,587 stations.

These figures create two records—the new business and the net gain figures being the highest ever obtained. The previous highest net gain figure was 6,263, obtained in February this year.

Mr. F. H. Jonghmans, Contract Officer, Class II on the staff of the City Contract Office retired from the service on superannuation on Nov. 17. He had been in failing health for some months past, and his retirement was not therefore altogether unexpected.

Mr. Jonghmans entered the service of the late National Telephone Co. in the South-East District Contract Office on May 21, 1907.

As these notes go to press, the staff of the Contract Branch are making arrangements to present Mr. Jonghmans with a material token of their esteem, and good wishes for his speedy recovery.

The old custom of holding an annual South-East Contract Dinner was revived this year and about 34 of the staff had a very enjoyable evening at the "New Inn" on Nov. 2.

Mr. Rutter, the District Contract Manager, who was in the Chair, said that he was glad to see so many of the staff present enjoying themselves and he rejoiced that these occasions could be arranged, as they did a great deal to maintain the good feeling which existed between the outside and the inside staffs.

The dinner was followed by a concert which included a clever monologue written and declaimed by Mr. McMillan, and entitled "The Kiosk Ghost." A surprise item was also provided by Miss Pidgeon, of the Controller's Office, who sang very charmingly.

* * * *

London Telephonists' Society.

On Friday, Oct. 26, the annual Whist Drive of the London Telephonists' Society was held at the Caxton House Restaurant, Tothill Street, Westminster. Many members and friends were present, and everyone appeared to be having a thoroughly good time.

A feature of the evening, as unusual as it was successful, was the introduction by the President of three novel competitions, which were held before the commencement of the play.

The first competition evoked great excitement. Photographs, taken while they were children, of various Traffic Officers, were displayed, and the object was to guess the identity of the greatest number ; there was a great deal of discussion over this, and it was as amusing to watch the facial expressions of the competitors as it was to hear their comments, as they recognised, or thought they recognised, some of their colleagues.

The other two competitions—one an anagram and the other an acrostic—on any London exchange name, brought in a number of splendid efforts. The result of the competitions was declared after supper and before the second part of the Whist Drive commenced.

The second general meeting of the Society was held on Friday, Nov. 2, at the City of London Y.M.C.A., 186, Aldersgate Street, E.C.1.

A debate was arranged, and the subject chosen was, "Does the work of a telephonist fit her to assume domestic responsibility ?"

There was a very large audience ; members, attracted not only by the topical nature of the subject, were drawn by the fame of the two antagonists.

Mrs. Hubert, who is better known as Miss Naomi Budden, and was before her marriage, a telephonist at Victoria Exchange, took the affirmative side ; while the opposite side of the question was upheld by Mr. R. C. Atkins, who under the pseudonym, "Percy Flage," is so well known to readers of "Talk of Many Things" of this Journal.

Many brilliant arguments were expounded by the opponents, and during the general discussion which followed many members added their opinions. Some of the statements had a delightfully reminiscent flavour, while others indicated flights of fancy based, apparently, on pure theory.

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The subject was covered very thoroughly, and in his summing up, the President said that although on the one hand it was claimed that it is because of her occupation, and on the other in spite of her occupation, there is absolutely no doubt whatever, that telephonists do make extremely good wives.

* * * *

Swimming Association Gala.

The annual gala was held at Pitfield Street Baths on Oct. 12. This was the tenth in the series and the interest in this branch of sport seems to increase each year. There were over 200 competitors representing the gentler sex and about 50 men competed in the various events.

The results were :—

Learners' Race for "Agnes Cox" Cup.

Miss Chellew, Primrose Hill	1
Miss Pickford, Hampstead	2
Miss Calnan, Primrose Hill	3

Team Race for "Pounds" Cup.

Regent Exchange (Holders)	1
Gerrard Exchange	2
Trunks Exchange	3

After a thrilling race Regent succeeded in retaining their title of team champions by 1⅘ secs. The scaled handicap held in connexion with this race was won by Western Exchange, Lee Green being second and Paddington third.

Breast Stroke Championship (66 yds.).

Miss House, Regent (59 sec.)	1
Miss McBinney, Trunks	2
Miss Palmer, Regent	3

Supervisors' Championship.

Miss Lloyd, Bishopsgate	1
Miss J. Davies, Avenue	2
Miss Thwaites, Tandem	3

L.T.S. Handicap.

Miss Groom, Regent	1
Miss Rider, Clissold	2
Miss Bryant, Willesden	3

Diving Championship.

Miss McBinney, Trunks (87 pts.)	1
Miss Williams, Regent } (72 pts.)	2
Miss Curnow, Holborn }	

This is the third year in succession that Miss McBinney has carried off this event.

The Shield awarded to the club scoring most points in championship events was won by Regent with 49½ points, Trunks being second with 30 points.

The prizes were presented by Miss Agnes Cox at the annual dance held at Australia House on Nov. 16. The usual happy evening brought the swimming season of 1928 to a fitting end.

* * * *

Football Notes.

The record of the club in the League tournament up to and including Saturday, Nov. 10, reads as follows :—

				Goals		
Played.	*Won.*	*Lost.*	*Drawn.*	*For.*	*Against.*	*Points.*
5	4	1	0	12	4	8

The only defeat was administered by the Land Registry by a penalty goal to none, given towards the end of the game for hands. A goal did not appear likely to accrue at the time and it is claimed that the infringement was purely accidental and did not justify a penalty award. However, it meant the loss of two valuable points when a draw would have been a more equitable result.

The game with the War Office ended in a win by two goals to none, but the points were only annexed after a fierce contest. It was early evident that the War Office, who were strengthened by the introduction of several senior team players, intended to impart plenty of vigour into the game and several of the London Telephone Service players suffered minor injuries.

The game on the whole was scrappy and much below the standard of play of recent matches.

The absence of Gordon through injury disorganised the forwards and the experiment of playing Carver at centre forward was not a success. Cowdray has not yet touched his last season's form, but one shot of his, late in the second half, was reminiscent of his true form.

The first round in the Clay Cup competition will take place on Nov. 24, when we meet Holloway Stores at Chiswick.

In the League Challenge Cup, we have a bye in the first round and are drawn to play the Ministry of Pensions First team in the third round. It was the Ministry of Pensions who, after a fine game, knocked us out of the competition last year by the odd goal in five.

The club will hold their next dance at Cornwall House on Wednesday, Nov. 28, and another will be arranged before Christmas.

* * * *

Lawn Tennis.

The Lawn Tennis Section of the L.T.S. Sports Association held the final for the "Cox" Cup on Saturday, Oct. 13, on the Hard Courts at Regent's Park. Clerkenwell, and A.R. 7, of the Accounts Branch were the finalists. Competition was keen throughout the games and the spectators, numbering about 100, grew very excited towards the close. Cheers from one set of supporters, then the other, as points were scored or lost, marked the progress of the last set, which ended in a win for A.R. 7.

The scores were as follows :—

1st Pairs.—A.R. 7 won, 6—3, 6—3.
2nd Pairs.—A.R. 7 lost, 4—6, 6—8.
3rd Pairs.—A.R. 7 won, 4—6, 9—7, 6—3.

Among the spectators were Miss Cox, the donor of the Cup, accompanied by Miss Epps, Mr. W. R. Bold, the Sup. of Accounts (a tennis enthusiast) and Miss Osler, the Tennis Secretary. Tea was provided in the excellent pavilion adjoining the courts. After tea, the Chairman of the Association called upon Miss Cox to present the Cup to the winners, and medals, from the Association, to last year's victors (Clerkenwell) and to A.R. 7. He expressed the renewed gratitude of the Association for the magnificent trophy presented for the competition. Miss Cox, in handing the Cup to the captain of the winning team, Miss Gardner, referred to the splendid spirit that prevailed throughout the games and her pleasure at being able to attend. The medals were then handed to the players in the final. In concluding, Miss Cox desired particularly to thank Mr. Beck, the Association Secretary and Treasurer, and Miss Osler, the Secretary of the Tennis Section, for all they had done to organise the Competition and bring it to such a successful conclusion.

* * * *

Dramatic Society.

An account of the newly-formed Stamford Dramatic Society's performance of "The Young Person in Pink" will be given in these notes next month.

* * * *

Mr. C. R. Bowden.

A large gathering of members of the Traffic Staff met the Assistant Controller's room on the afternoon of Oct. 31 to bid farewell to Mr. C. R. Bowden prior to his departure for the Federal Malay States to take up the position of Superintendent of Posts and Telegraphs.

Mr. Pink, in a happily-phrased speech, expressed the high esteem in which Mr. Bowden was held by his colleagues in the L.T.S., and on their behalf presented him with a suitably inscribed gold wristlet watch and a silver cigarette case. Mr. Bowden made a graceful speech in response.

EX-NATIONAL TELEPHONE RE-UNION.

OVER 400 applications were quickly received for tickets for the Dinner and Re-union of old telephone associates to be held at the New Criterion Restaurant on Monday, Dec. 10.

The interest taken in this assembly of men and women who have worked together for various periods between 1879 and 1912 –33 eventful years – in a peculiarly fascinating business is the best justification for this gathering of old telephone brigades.

The evening promises to be one of intense interest, and the correspondence which has taken place has disclosed many diverse and romantic experiences during the 17 years since the transfer.

Ex-officers, some of whom have not seen each other for 20 or 30 years, are coming up to town for the occasion.

The Secretary to the Arrangements Committee, Mr. T. A. Prout, will be at the New Criterion Restaurant, Piccadilly Circus, in the Victoria Hall and adjoining reception-room floor, from 5 p.m., in the event of visitors from the provinces wishing to make any enquiry relating to the evening's Re-union. The reception is fixed for 7, and the dinner half an hour later.

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GLASGOW TELEPHONE NOTES.

A FANCY Dress Dance was held by the Douglas Exchange Staff (ladies only) on Friday night, Nov. 2, in Prince of Wales Hall, Sauchiehall Street, Glasgow. The company numbered about one hundred and included representatives from several of the Glasgow Exchanges.

The dresses worn were very beautiful and many of them unique.

During the evening our respected District Manager and wife, Mr. and Mrs. Coombs, visited the Hall and were accorded an enthusiastic reception.

Miss Mortimer, Supervisor, and Miss Caughie, Assistant Supervisor, Douglas Exchange Staff, were present at the dance, the arrangements for which reflected the greatest credit on all concerned. It is hoped that other similar gatherings will take place.

The Mastery of Self.

I was asked the other day what I thought were the three greatest things in life, and when I stopped to ponder I found that there were so many great things—truth, knowledge, love, beauty, fame, courage, kindness—that it was difficult to determine. Then I thought there must be some essentials, and that the reason of life should tell us what these are.

What one considers the greatest things in life vary according to one's disposition and experience, and as one grows older these must necessarily develop and alter.

I feel that the first and last thing in life, the reason of our sojourn in this world, is "the mastery of self." Our present life is like our school time, in which we learn the lessons that will be useful and will fit us for a higher life in the "hereafter": and just as at school we could never understand why certain lessons were necessary, yet in later life we learned the necessity in the application of that knowledge, so in the hereafter we shall benefit by our "schooldays" here if we learn our lessons aright.

"The mastery of self"—to know ourselves and to eradicate what is wrong and arbitrary in our natures so that the good may predominate; to fight and conquer what we know to be our weaknesses and to form a character after our best ideal would, indeed, embody all that is great in life: for in striving to attain this we should require to do that which we feel is most important in life, the accomplishment of some work in life that is worth while, done in such a way that a good influence is felt by those among whom we labour. "For if our virtues did not go forth of us, 'twere all alike as if we had them not. Spirits are not finely touched but to fine issues."

Energy, of which everyone has a given amount, must be utilised. It must have an outlet, and if possible, in a congenial task; for one naturally desires to express one's individuality in the most happy environment. But it so often happens that circumstances force us into a position which is not of our own choosing; and then we find that we must bend to life, for life will not yield to us. And thus we learn to realise that it is not so much *what* we do as *how* we do it that counts in life.

Sympathy plays a large part in the formation of our character because through our thought for others we eliminate selfishness. To help our fellow creatures in sincerity and with cheerfulness, to bring joy and happiness into the circle of our intimate relationships, to give our deep affection to those nearest and dearest to us, these are the greatest incentives to higher effort and the "doings" of life become a joy and the working out of our "karma" a benefit and happiness to others as well as to ourselves.

Such an ideal is indeed difficult of attainment, but if we "hitch our wagon to a star" and learn to benefit by each failure there will come a time when we shall be proclaimed "The Victor," as Browning depicts him:—

"One who never turned his back but marched breast forward,
Never doubted clouds would break,
Never dreamed, though right were worsted, wrong would triumph,
Held we fall to rise, are baffled to fight better,
Sleep to wake."

M. L. TULLOCH.

Glasgow Echoes.

ODE TO THE TRAFFIC BRANCH.

This branch is truly an arduous section;
No wonder—they meet every objection
From morning till late, without restraint,
They deal with many a fault and complaint,
Their duty it is to eliminate waste
And other things truly not to their taste.

ODE TO THE CONTRACT BRANCH.

This little company in work exults,
But does all it can to produce "results,"
With maxim, gesture and winning smile,
Until the subscriber thinks it worth while
To sign an agreement, his name to appear
In the Telephone List for the ensuing year.

R. A. THOMSON.
Boy Messenger (Telephones).

LIVERPOOL TELEPHONE NOTES.

JAMES M. MOYES (Daddy) has left us. A long-standing disability, borne patiently and cheerfully, has at last necessitated his retirement. His departure creates a gap which, on account of his personality, will be difficult to fill. He will be well known by many telephone people outside the Liverpool District, and we are sure that all who have associated with him will join with us in hoping that, freed from the every-day cares of active duty, he will long remain on the debit side of the Service Revenue Accounts. May his health remain such that he can still enjoy social pleasures.

Another distinct personality in Miss Eileen Jones has also gone from from us. The lady in question has taken *the* serious step and, of course, the occasion was marked by a wealth of gifts, together with much fluttering amongst the fair members of the staff. Miss Jones was associated with the organisation of many social functions of the Post Office, and, as she has made her choice from the Service, we shall no doubt see something of her in the future.

With the coming of winter the good work previously carried on in the district has been continued. A programme has been drawn up in connexion with staff meetings, and it is hoped that the good results obtained last session will be further enhanced. A dance organised by the Central Exchange was held at the Grafton Rooms on Nov. 15, and upwards of 500 of the very young, young, and not so young, spent an enjoyable evening.

We would like to add our congratulations to those of Glasgow in wishing every future happiness to Mr. J. J. O'Rourke, late of Liverpool Traffic. Are there, by the way, any auction rooms in Glasgow, or is every purchase a bargain?

MANCHESTER NOTES.

THE Manchester Supervising Officers are clearly resolved to take the fullest advantage of every opportunity to acquire an intimate knowledge of Manchester's new automatic system, consequently there was again a full muster on the evening of Oct. 14, when Mr. J. L. Parry gave the second lecture of the series on Automatic Telephony.

The mysteries of the switching apparatus were further explored, investigation being greatly facilitated by the use of switches made available by the courtesy of the A.T.M. Co. and lantern slides borrowed from the Engineer-in-Chief's Training School.

Questions increased in number and complexity and a very interesting discussion ensued.

It is understood that the local branch of H.M. Stationery Office is experiencing a steady demand for the pamphlet, the subject of which is Automatic Telephony, and that supplies have become temporarily exhausted.

AIR PICTURES.

TELEVISION DEVELOPMENT IN THE U.S.

BY THE AIR CORRESPONDENT OF THE "DAILY MAIL," AUG. 1.

IN connexion with recent developments in television in the United States, great secrecy is being observed regarding a device which is about to be tested at one of the United States Government air-stations.

It is claimed that a pilotless aeroplane will be able to record, and transmit to a ground station, all that is visible around it as it flies.

A feature of the mechanism is said to be a system of lenses, projecting above, below, and on either side of the body of the aeroplane. Through these will pass pictures of all that lies within visual range; after which, by a combination of wireless and of light-sensitive cells, these images will be flashed from the aircraft and reproduced on a screen in front of an operator at the ground controlling-station.

[We think this must have been communicated by our contemporary's "hot air correspondent." Aerial photographs even when clear, sharp, and well-defined have their limitations, and it is suggested that television has none. Yet no one has seen a sharp "televised" picture. It may, of course, be merely a publicity stunt. Those publicity people are very clever in their efforts to find a "best seller"! But possibly the paragraph is only an outcrop of leg pulling—a common disease in the holiday season—and we may wake up one morning to find the writer of it recommending television as a means of solving all knotty problems, and urging us to try it for filling up Income Tax forms, spotting a winner, or finding a lost collar stud.]

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A BRIEF CHRONOLOGY FOR STUDENTS OF TELEGRAPHS, TELEPHONES AND POSTS.

By HARRY G. SELLARS.

(*Continued from page* 20.)

1869, Jan. 1 ... Money Order system established between United Kingdom and Switzerland, with commission at inland rates.

1869, Jan. 26... Dr. Emanuel Herrman, of Vienna, suggested the use of postcards. They were introduced in Austria on Sept. 25, 1869.

1869, July 1 ... Money Order system established between United Kingdom and Belgium.

Bright improved his duplex apparatus and his acoustic "Bell" telegraph.

Committee formed to determine a system of electrical units reported.

Franco-American cable laid.

West India and Panama Telegraph Company obtained subsidies for certain cables in West Indies from English and French Colonies.

Elisha Gray and Enos M. Barton, of U.S.A., entered into partnership for the manufacture of electrical instruments.

1869, Dec. 11... William Alfred Marshall, of London, patented a method of enclosing wires in lead piping and insulating them with paraffin wax.

Marshall invented an earth borer with a circular cutting plate for use when erecting telegraph poles.

Post Office began to issue dog licences.

Net revenue of Post Office, £1,404,886.

1870, Jan. 18... Cable completed between Salcombe, Devonshire, and Brest for Compagnie Française des Cables Télégraphiques.

1870, Jan. 28... Telegraphs transferred to the State. Capital Stock to the value of £10,948,173 was created to compensate the Electric and International, the British and Irish Magnetic, the United Kingdom Electric, and other telegraph companies. Post Office began the service with 1,000 postal telegraph offices and 1,800 offices at railway stations. About 60,000 miles of wire in use. Income at that time was about £550,000 per annum and the number of telegrams transmitted, 6,000,000. Charge for Inland Telegrams fixed at 1*s.* for 20 words (names and addresses free). Press rate for telegrams fixed at 1*s.* for 100 words at night, or 75 words by day, with an additional charge of 2*d.* per 100 or 75 words for transmission to each additional address.

1870, June 21 Cable laid between St. Mary, Scilly Islands, and Bottallack, Cornwall.

Alexander Muirhead devised a telegraph recorder somewhat similar to Kelvin's syphon recorder, and invented a transmitter which hastened the discharge of a cable at the end of a working signal.

Muirhead, in collaboration with Herbert Taylor, devised a method of duplexing cables.

(S. G. Brown, Axel Orling and Heurtley invented the "drum" relay, "liquid jet" relay and a signal magnifier for cable working, respectively.

G. O. Squier devised a system of cable working using low frequency alternating currents.)

1870, Oct. 1 ... Post cards introduced in England.

1870, Oct. 1 ... Pattern and Book Post rate reduced to ½*d.* for every 2-oz. Limit, 12 oz.

1870, Dec. 27... British Government, acting on information supplied by Count Bernstoff, Prussian Ambassador, seized in the Thames a vessel named *International* which had on board a cable destined for the French coast.

Expedition of seven vessels sailed with cables for the West Indies.

Two telegraph cables to Holland and one to Germany acquired by Post Office and leased to the Submarine Telegraph Company.

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Penang-Australia cable laid.

Cyrus Field (U.S.A.) proposed a cable route from California to China via Alaska and Japan.

Wheatstone and Stroh's automatic telegraph worked at 70 to 80 words a minute.

Varley invented the "cymaphen" for the purpose of conveying sounds by wire.

Indo-European Telegraph Company's route overland to Teheran completed.

Central News established.

Professor Fleeming Jenkin demonstrated the electrical capacity of a submarine cable.

Series of electrical units adopted by the British Association brought into use in Great Britain and her Colonies.

Number of telegrams dealt with during the year—10,000,000.

9,750,000 Money Orders issued.

India Mail sent via Belgium and Germany to Brindisi.

Annual average number of letters passing through the Post Office, 791,000,000.

Net Postal Revenue, £1,449,315. Profit on Telegraphs, £47,425.

Stamped newspaper wrappers introduced.

An Act of Parliament established a postage rate of ½*d.* for newspapers.

Messrs. Reuters opened an office in Old Jewry, London.

Holmes and Van Malderen constructed a magnetic-electric machine in which sixty-four separate coils rotated between the poles of forty magnets.

Great Northern Telegraph Company's communication with Vladivostock completed.

Gramme constructed a dynamo-electric machine with a modified ring armature and invented a continuous current generator.

Bernard Meyer devised a multiplex telegraph with four channels. The keyboards had eight keys (black and white, like piano) and morse characters were printed at the receiving end.

1871, May 1 ... Money Orders issued with commission ranging from 1*d.* for 10*s.* to 1*s.* for £10.

1871, June 11 Morse statue unveiled in New York and in the evening Morse addressed a meeting of people interested in telegraphy.

1871, Oct. 5 ... Pattern Post abolished.

1871, Oct. 5 ... Rates of postage altered to 1*d.* for first ounce, for the second ounce ½*d.*, for every succeeding two ounces up to 12 ozs., ½*d.* Above 12 ozs. for every ounce, including the first 1*d.*

Postmaster-General anticipated the time when free delivery will be provided for every house in the country at least two or three times a week.

Rates for Money Orders to Belgium and Switzerland raised to scale ranging from 9*d.* for £2 to 3*s.* for £10.

Antonio Meucci patented, at Washington, a telephonic apparatus, after having submitted it to the President of the New York District Telegraph Company.

1871, Oct. 21 Telegraphists' Association formed in England. Suspension of its leaders and a strike followed.

Eduard Friedrich Weber died.

Duplex telegraph working introduced in Postal Telegraph Service.

Wheatstone patented a mercury relay for telegraphic work.

Elkington precipitated copper by electrolysis from fused sulphate of copper and iron.

International Telegraph Conference in Rome.

103,000,000 newspapers passed through the post.

About 75,000,000 postcards passed through the Post Office.

1872, Jan. 5 ... Indian Mail sent via Calais, Mont Cenis tunnel, and Brindisi.

1872, March ... Edmund Yates left the Post Office service.

1872, April 2... Samuel Finlay Breese Morse died in New York.

1872 ... ... Thomson's steel wire sounding apparatus was introduced, thereby rendering a close and accurate deep-sea survey practicable.

Baudot tried to combine the Hughes printing telegraph with the multiplex system used by Meyer in 1871.

Wheatstone devised a telegraph tape perforator.

Reuters introduced the "packed" telegram and accepted messages for retransmission.

Western Electric Manufacturing Company formed to take over business of Gray and Barton.

Arlincourt devised a writing telegraph system.

Meyer devised a six-channel multiplex morse telegraph system.

Exchange Telegraph Company established.

Hefner-Alteneck constructed a dynamo-electric machine with a drum armature.

International Telegraph Conference in Rome, Great Britain being represented for the first time. British delegate, Alan E. Chambre, opposed "urgent" telegrams.

British Post Office Savings Bank deposits, £6,664,629.

1873 ... ... Latimer Clark invented a voltaic cell made up of platinum, mercurous sulphate, zinc, and zinc sulphate. Dr. A. Muirhead and Lord Rayleigh improved the construction of the cell.

Skrivanoff modified a zinc-carbon cell made by Latimer Clark and rendered it dry.

Siemens and Halske introduced a self-exciting dynamo with drumwound armature and a bar commutator.

Von Hefner Alteneck modified the shuttle-shaped armature for magneto-electric machines devised by Siemens.

Edison devised a carbon rheostat.

1873, Sept. 1... Compulsory registration extended to letters containing jewellery and watches.

Meyer exhibited at the Vienna Exposition his four-channel multiplex telegraph system using morse code.

Edison introduced tape for transmitting signals in which the words to be telegraphed were perforated.

Anglo-American Telegraph Company's first cable laid from Valentia (Ireland) to Heart's Content (Newfoundland).

1873 ... ... Light-sensitive properties of selenium discovered by telegraph operator named May at Valentia.

Willoughby Smith confirmed that selenium changes its electrical resistance when under the influence of light. Prof. W. G. Adams found that the change of resistance varies directly as the square root of the illumination.

Hippolyte Fontaine, at the Vienna International Exhibition, accidentally discovered that a dynamo would act as a motor when supplied with current.

James Clerk Maxwell showed that an electrical oscillation in a circuit would give rise to an electro-magnetic disturbance which would travel as a free wave. He postulated that light was an electro-magnetic wave.

1874, Feb. 4 ... Central Telegraph Office, London, transferred from Telegraph Street to General Post Office (West).

1874, Mar. ... Physical Society of London formed by Professor Frederic Guthrie, who published an important work on *Magnetism and Electricity.*

1874, April 25 Guglielmo Marconi born at Griffone.

1874, Sept. 15 Nations meet at Berne to discuss proposed Universal Postal Union.

1874, Oct. 19 International Postal Union constituted. Discussed a proposal for allowing letters with declared value to pass in international mails. Question left undecided. Agreed to free redirection of letters throughout the Union.

Alfred Mayer studied the effect of magnetisation on iron and steel bars.

Direct United States Cable Company's cable laid.

Emile Baudot invented a synchronised multiplex type-printing telegraph system using a 5-unit alphabet, the signals being forwarded by means of five keys and received in Roman characters on paper tape.

Hardy introduced a planetary gear between the governor and the distributor of Meyer's multiplex telegraph. Baudot also devised a correcting arrangement.

(To be continued.)

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THE

Telegraph and Telephone Journal.

VOL. XV. JANUARY, 1929. No. 166.

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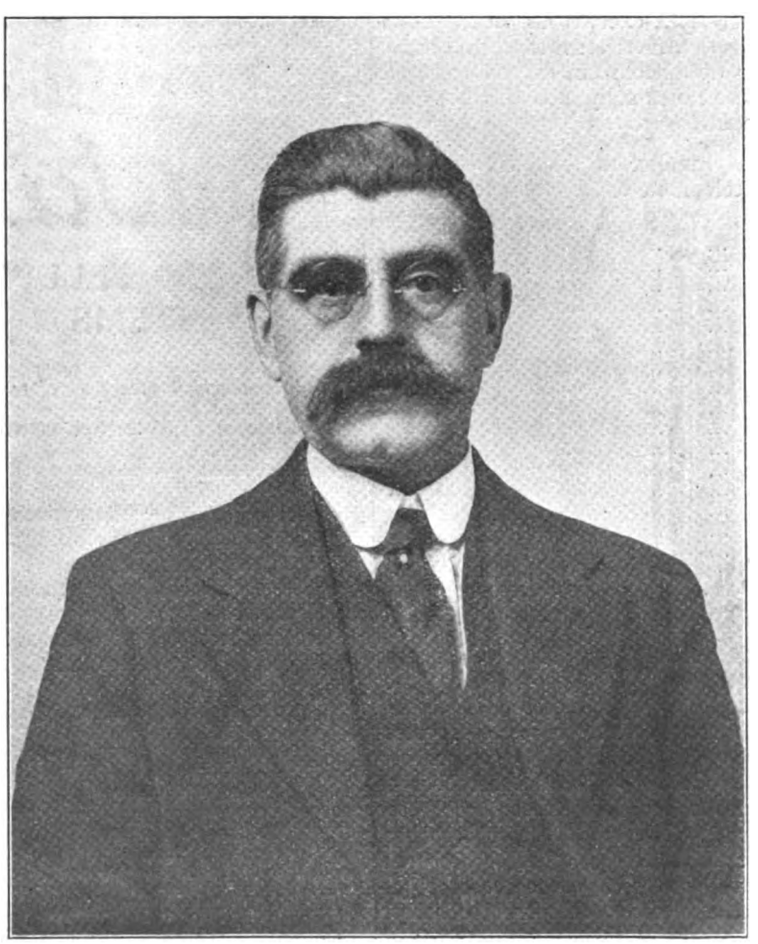
All correspondence relating to advertisements should be addressed to MESSRS. SELLS, LTD., 168, *Fleet Street, London, E.C.*4.

TELEGRAPH AND TELEPHONE MEN AND WOMEN.

LX.—MR. JOHN R. GALL.



MR. JOHN R. GALL, the subject of this month's biographical sketch, entered the service of the United Telephone Co., Ltd., in Oct., 1887, and after gaining experience in several exchanges was appointed assistant to the late Mr. J. W. Ullett, in 1889, in which position he remained for some four years. During this time a great deal of original research work was carried out, particularly in connexion with the development of the multiple switchboard, the Liverpool telephone transformer and the design of subscribers apparatus. He took an active part in the estimating for and the erection of some of the first Trunk lines between London and the North of England. He was also concerned in the inauguration of the electrophone at the Savoy Theatre in the palmy days of Gilbert and Sullivan, this being the first London theatre from which telephone transmissions were given to the public.

In 1893 when, following the completion of the amalgamation with the National Telephone Company, the Engineer-in-Chief's Dept. was formed with Mr. Dane Sinclair at its head, Mr. Gall was entrusted with the formation and control of the Test Section. In these early days the functions of this section were numerous, including the design and acceptance of all apparatus and materials used by the Company, the supervision of electric light, power, and heating installations and experimental and research work. Mr. Gall retained this position until the transfer of the Company's undertaking to the Post Office, and during the whole period of the arbitration proceedings, when he was responsible *inter alia* for the production of the many models exhibited for the assistance of the Court. He was appointed Staff Engineer in the P.O. at the transfer in January, 1912, and took charge of the Test Section on his release by the Company in January, 1913.

Since 1919 he has been the head of the Designs Section, a capacity for which his training and experience eminently fit him.

We believe that Mr. Gall finds relaxation in gardening and, anyhow, he is the best of good fellows.

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TELEPHONE DEVELOPMENT OF THE WORLD AT 31ST DECEMBER, 1927.

BY W. H. GUNSTON.

THE collected statistics of the telephonic development of the world at the end of 1927 show that since Dec. 31, 1926, about 1,470,000 telephones have been added to the total, and, as an increase of about a million and a half has been fairly constant during recent years, it may safely be estimated that there are at the present time about 32 and a half million telephones in service on the earth.

The totals for 1926 and 1927 are distributed as follows :—

	Dec. 31 1926. (*Thousands.*)	*Dec.* 31, 1927. (*Thousands.*)
Europe	8,020	8,541
Asia	963.5	993.5
Africa	168.5	187.5
North America	19,120	19,958
South America	427.7	439
Australasia and Oceania	578.5	630
	29,278	30,749

The figures for 1926 have been adjusted slightly (vide article on the same subject in the *Journal* of Jan. 1928) in the light of later information.

Europe shows an increase of 521,000 or 6.4% on the preceding year, whilst North America increased by 838,000 or 4%. Last year the increases over the preceding year were 7% and 5% respectively.

The statistics in the annexed tables are all obtained from official or authoritative statistics for 1927, except that in the cases of Russia, Poland, Finland, the South American States, and some less important countries, they are obtained from estimates based on the official figures for 1926. The notes subjoined to the tables give fuller information on this point.

The following table shows the number of telephone stations per 100 inhabitants of the chief telephone-using countries at the end of 1927 :—

United States	16
Canada	12.7
New Zealand	9.9
Denmark	9.2
Sweden	7.6
Australia	7.4
Norway	6.3
Switzerland	5.5
Germany	4.4
Great Britain	3.6
Netherlands	3.2
Finland	3.1
Austria	2.4
Belgium	2.4
France	2.1
Argentina	2.1

This list includes all States possessing upwards of 100,000 telephones and a density of at least 2 telephones per 100 population.

It is to be observed that the figures of population on which these ratios are based are those estimated for 1926 in the League of Nations handbook, or figures supplied by the Administrations themselves. This will account for an apparently retrograde figure of telephone development in some cases where last year's ratios were based on old census returns. In Great Britain despite the fact that over a million and a quarter has been added this year to the population figure (for the sake of the additional accuracy obtained by using the League of Nations' figure instead of—as formerly—the 1921 census) there is nevertheless an increase of 0.2 telephone per 100 inhabitants in the recorded telephone density.

EUROPE.

From the annexed table (I) it will be seen that there is one telephone to every sixty inhabitants in Europe. The development of Europe, however, shows a much better aspect if the relatively undeveloped East and South are left out of consideration. In the Western and Northern part of Europe, comprising Scandinavia, Germany, Austria, Switzerland, Holland, Belgium, France, Great Britain and Ireland, there are about 188 and a half million inhabitants and over 7.1 million telephones, a ratio of 26 to 1.

The principal increases in growth took place in Germany, 126,501 (nearly 5%); Great Britain, 122,217 (8%); France, 60,536 (7.3%); Belgium, 20,074 (nearly 12%); Sweden, 16,121 (3.5%); and Switzerland, 12,989 (6.5%). The apparent heavy increase in Italy is due to the fact that the figures for 1926 and 1927 were obtained from different sources. The total of 272,433 for 1927 (obtained from an American source) is probably more accurate than the round figure shown for 1926.

I.—EUROPE.

Country.	*Population (thousands).*	No. of Telephones. *Dec.*31,1926.	No. of Telephones. *Dec.*31,1927.	*No. of Inhabs. per telephone.*
Austria	6,750	158,078	165,613	40
Belgium	7,875	173,681	193,755	40
Bulgaria	4,861	12,750	14,358	340
Czecho-Slovakia... ...	14,353	130,235	136,614	105
Danzig	356	17,157	17,466	20
Denmark	3,460	315,984	319,554	10.9
Esthonia	1,250	12,290	13,500*	93
Finland	3,402	99,331	108,000*	31.5
France	40,925	822,870	883,406	46
Germany	63,100	2,688,495	2,814,996	22.4
Great Britain	45,500	1,511,585	1,633,802	27.8
Greece	7,000	5,500	5,620	1,250
Hungary	7,482	80,183	88,961	84
Iceland	94	3,355	3,811	25
Irish Free State ...	2,975	24,583	26,084	114
Italy	40,425	210,000	272,433	148
Latvia	2,000	24,192	29,165	69
Lithuania	2,000	9,600	9,864	204
Luxemburg	263.8	8,579	9,000*	29
Netherlands	7,526	226,952	240,611	31
Norway	2,788	174,500	176,000	15.7
Poland	29,589	135,347	145,000*	204
Portugal	5,775	21,850	24,000	240
Russia	146,989**	241,378	260,000*	565
Rumania...	17,000	47,692	56,000	303
Serbs, Croats, and Slovenes, Kg. of ...	12,800	27,979	32,801	390
Spain	22,285	134,860	142,000	157
Sweden	6,074	450,646	466,787	13
Switzerland	3,959	210,486	220,615	18
Turkey	2,000	10,907	11,389	176
Total (including estimates for the Saar District, Gibraltar, &c.) ...	514,300	8,020,000	8,541,000	60

* Estimated. † From an American source. ** 112,000 in Europe.

The figures for Esthonia, Finland, Luxemburg, Poland, and Russia are based on the anticipated increase on last year's figures.

The official information obtained from Norway showed the development of the State system at June 30, 1927, and of the private systems at Dec. 31, 1926. It has been necessary to estimate the probable increase of these systems up to December, 1927.

The telephone system of Great Britain consists of :—

Post Office system	1,598,916
Hull Municipal system	15,422
States of Guernsey system	4,053
States of Jersey system	3,091
Railway and private telephones with exchange facilities	12,320
	1,633,802

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II.—ASIA.

Countries.	*Telephones.*
Ceylon	8,383
China	125,000†
French Indo-China	5,186
Federated Malay States	5,874
India (47,624)	53,000*
Iraq	1,037
Japan (proper) (636,727) ...	641,030
Chosen (32,061)	34,000*
Formosa (Taiwan) (12,818)...	13,000*
Quantung (17,217)	18,000*
Saghalien (3,807)	4,500*
Netherlands East Indies (43,329)	46,404
Palestine	2,945
Persia	3,449
Phillipine Islands (17,814) ...	18,500*
Siam...	2,000*
Straits Settlements—	
Penang, 1,750*	9,000
Malacca, 500	
Singapore, 6,714	
Turkey in Asia	2,000*
	993,500

* Estimated from last year's figures.

† From an American source. The number of stations on the Chinese State telephone system is 34,743, but there are also several companies operating in China.

As there are at least 10,000 telephones in Russia-in-Asia (included in the statistics for Europe) it will be seen that there are now over a million telephones in Asia.

The population of Asia is estimated at 1,013,000,000 and the number of inhabitants per telephone is therefore 1,013.

III.—AFRICA.

Countries.	*Telephones.*
Algeria (24,060)	28,305
Belgian Congo	800
Egypt (36,778)	39,054
Kenya and Uganda	2,000*
Mauritius (1,098)	1,133
Madagascar (1,474)	1,600*
Morocco	7,415
Nigeria and Cameroons	1,709
S. Rhodesia	2,741
South Africa (81,659)	88,880
S.W. Africa	1,165
Tunis (9,942)	10,500*
Other places	2,000
	187,500

* Estimated. The figures in brackets show the number of telephones in 1926.

Population 143,000,000. Inhabitants per telephone 763.

IV.—NORTH AMERICA.

	Population (thousands).	*Telephones.*	*Inhabitants per telephone.*
United States of America (17,746,152) ...	115,920	18,523,500	6.26
Canada (1,204,691) ...	9,597	1,265,869	7.6
Mexico (57,563)... ...	15,500	60,000	258
Cuba (65,216)	3,500	68,000	57
Porto Rico (13,374) ...	1,300	14,500	89
Other West Indies ...	3,500	5,000	—
Central America (20,283)	6,500	21,000	309
	155,800	19,958,000	7.8

The figures in brackets show the number of telephones in 1926.

The development of Mexico, Cuba, Central America, &c. is estimated from figures obtained from an American source.

The total of the *United States* is made up as follows :—

	Telephones.
American Telephone and Telegraph Co. and Associated Companies	13,726,056
Independent Companies in connexion with above	4,639,430
Entirely Independent	158,000
	18,523,486

The increase in stations over 1926 was 777,348 (or 4.4%).

Canada.—The total number of telephones was thus distributed amongst the provinces :—

	Telephones.
Ontario	561,043
Quebec	262,784
British Columbia	108,556
Saskatchewan	106,215
Manitoba	74,124
Alberta	73,634
Nova Scotia	41,716
New Brunswick	31,397

The total increase was 61,178 stations (or 5%).

V.—SOUTH AMERICA.

	Population (thousands).	*Telephones.*	*Inhabitants per telephone.*
Argentine (204,463) ...	10,312	220,000	47
Bolivia	—	2,000	—
Brazil (105,209) ...	36,871	108,000	340
Chile (36,860)	4,750	39,000	122
Colombia (18,875) ...	8,057	20,000	402
Ecuador	—	4,500	—
Paraguay	—	500	—
Peru (13,299)	6,000	15,000	400
Uruguay (26,915) ...	1,720	27,500	63
Other places	—	2,500	—
	77,791	439,000	177

The development of South America is estimated from the official figures for 1926, the latest obtainable.

The figures in brackets show the number of telephones in 1926.

VI.—AUSTRALASIA AND OCEANIA.

	Telephones.	*Population (thousands).*	*Inhabitants per telephone.*
Australia (424,442) ...	461,715	6,234	13
New Zealand (Mar. 31/28)	144,552	1,453	10
Hawaii (19,648) ...	20,500	256	12.5
Other places in Oceania	3,000	700	—
	630,000	8,800	14

Australia.—The telephones are thus distributed amongst the various States.

New South Wales	175,301
Victoria	143,700
Queensland	55,351
South Australia	49,881
Western Australia	24,574
Tasmania	12,908

The increase over 1926 is 37,273 or 9%.

CITIES WITH UPWARDS OF 100,000 TELEPHONES.

	Telephones.	*Inhabitants per telephone.*
New York	1,599,915	3.8
Chicago	903,460	3.5
London (telephone district) ...	565,590	13.2
Berlin	448,030	9.0
London (Administrative County) ...	429,422	10.4
*Boston (Mass.)	416,784	4.3
Philadelphia	399,404	5
*Los Angeles	333,971	8.8
Paris	311,373	9.0
*Detroit	291,917	5.5
San Francisco	239,155	3.0
*Cleveland	211,014	5.2
*St. Louis	201,421	5.3
*Pittsburg	200,685	4.8
Toronto	173,264	3.8
*Montreal	161,380	5.5
Hamburg—Altona	157,710	8.3
*Cincinnati	154,021	4.4
Washington	147,347	3.5
*Milwaukee	137,303	4.8
*Kansas City	136,938	4.6

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	Telephones.	*Inhabitants per telephone.*
*Copenhagen	133,743	6.8
Tokyo	125,649	17.0
Baltimore	124,761	6.5
Minneapolis	122,279	4.9
Buffalo	117,184	5.2
Stockholm	114,923	3.5
*Oaklands (Cal.)	114,506	4.2
Buenos Aires (1926)	112,137	18
Seattle	109,645	3.6
Vienna	105,420	17
*Sydney	103,254	16.9

* Including suburbs.

CITIES WITH UPWARDS OF 10,000.

United States :—(The chief of these are in the foregoing table).	158
Germany :—(Berlin 448,030, Hamburg 157,710, Munich 66,396, Leipzig 62,309, Cologne 61,682, Dresden 55,431, Frankfurt-Main 54,416, Düsseldorf 40,496, Breslau 39,619, Stuttgart 38,839, Hanover 33,262, Nuremberg 32,582; Bremen, Essen, Mannheim, Chemnitz, Duisburg, Magdeburg, Königsberg, over 20,000; Dortmund, Stettin, Elberfeld, Halle, Kiel, Barmen, Cassel, Aachen, Brunswick, Karlsruhe, M. Gladbach, Crefeld, Wiesbaden, and Erfurt, over 10,000)	33
Great Britain :—(London 565,590, Manchester 54,439, Liverpool 50,788, Glasgow 50,401, Birmingham 42,784, Edinburgh 23,717, Leeds 18,676, Newcastle-on-Tyne, Bradford, Hull, and Sheffield each over 16,000; Bristol over 15,000; Cardiff, Belfast, and Nottingham over 13,000; Leicester over 11,000; and Bournemouth over 10,000)	17
Canada :—(Toronto 173,264, Montreal 161,380, Ottawa 35,252, Quebec 20,547; Vancouver, Winnipeg, Hamilton and Windsor (Ont.), London (Ontario), Victoria (B.C.), Halifax (N.S.), Edmonton, and Windsor (Ont.), between 10,000 and 30,000) ...	12
France :—(Paris 311,373, Lyons 21,827, Marseilles 20,911, Bordeaux 13,558, Lille 12,049, Strasbourg 11,793, Nice 10,048)	7
Japan :—(Tokio 125,649, Osaka 86,100, Kyoto 29,107, Kobe 25,036, Nagoya 24,980, Yokohama 12,696)	6
Australia :—Sydney 103,254, Melbourne 85,884, Brisbane 21,701, Adelaide 29,514, Perth 13,960)	5
Switzerland :—(Zurich 30,730, Geneva 17,250, Basle 17,040, Berne over 14,000)	4
Italy :—(Milan 28,507, Rome 19,900, Turin 12,479, Genoa 11,131) ...	4
Netherlands :—(Amsterdam 41,057, Rotterdam 35,643, The Hague 33,265)	3
Belgium :—(Brussels 66,532, Antwerp 27,864, Liége 13,390) ...	3
Sweden :—(Stockholm 114,983, Göteborg 31,483, Malmö 15,875) ...	3
New Zealand :—(Auckland 17,460, Wellington 17,167, Christchurch 11,188	3
Russia :—(Moscow 65,350, Leningrad 53,090)	2
Spain :—(Barcelona and Madrid each over 20,000)	2
Norway :—(Oslo 42,609, Bergen 10,200)	2
India :—(Calcutta 13,599, Bombay 12,000)	2
Egypt :—(Cairo 15,555, Alexandria 11,125)	2
South Africa :—(Johannesburg 24,156, Cape Town 14,961) ...	2
China :—(Peking 42,000, Shanghai 26,000)	2
Argentina :—(Buenos Aires 112,137*)	
Austria :—(Vienna 105,420)	
Brazil :—(Rio de Janeiro 37,778*)	
Chile :—(Santiago 10,978)	
Czecho-Slovakia :—(Prague 19,240)	
Cuba :—(Havana 45,043*)	
Danzig :—(Danzig 10,892)	
Denmark :—(Copenhagen 133,743)	
Hungary :—(Budapest 37,455)	17
Ireland :—(Free State, Dublin 14,691)	
Latvia :—(Riga 12,311)	
Mexico :—(Mexico City 33,776*)	
Poland :—(Warsaw 39,000)	
Portugal :—(Lisbon 16,151)	
Rumania :—(Bucharest 12,500)	
Turkey :—Constantinople 11,389)	
Uruguay :—(Monte Video 16,025*)	
* At Dec. 31, 1926.	289

Of these 289 cities, 172 are in North America, 91 in Europe, 10 in Asia, 8 in Australasia, and 4 each in Africa and South America.

It may be added that there are 60 cities and their suburbs in the world with upwards of 50,000 telephones. Of these 35 are in the United States, 7 in Germany, 4 in Great Britain, 2 each in Australia, Canada, Russia, and Japan, 1 each in Argentina, Austria, Belgium, Denmark, France, and Sweden.

SOME REFLECTIONS ON THE TELEGRAPH SERVICE.

I AM not so sanguine as to suppose that what I have to say is in any sense original; on the contrary, the principles which I am about to lay down are as old as the Telegraph service itself.

Nevertheless, believing as I do that Truth is great and must ultimately prevail, I am emboldened to set forth certain fundamental requirements which must be fulfilled if in any wise the Telegraph chestnuts are to be pulled out of the flames :—

(1) There must be greater stability coupled with (so far as that may be possible) greater uniformity of apparatus: Until our engineering friends can provide us with more stable and more uniform types of apparatus there can be no *sustained* increase of output.

(2) There must be a more even flow of traffic so that plant may be employed to something approaching its full capacity. No doubt the subject bristles with difficulties, but it should not be beyond the wit of man to devise such modification of the existing tariff as would, in some measure at any rate, secure this end.

(3) The fact that we are living in an age of mechanical and scientific development bewildering in its complexity and in the rapidity with which new ideas are constantly assuming concrete form, calls for the closest and most sympathetic co-operation between all those to whom the interests of the Telegraph service are of vital concern.

(4) Some incentive to effort must be forthcoming if the best results are to be obtained from the rank and file. If this cannot be provided along the recognised avenues of promotion, then some other means of providing it must be devised. Cases of slackness should, of course, be suitably dealt with, but these are happily comparatively rare and do not call for the wholesale application of coercive methods. The experience of the world has demonstrated that it is impossible to devise any system of compulsion which will induce men in the mass to work as efficiently and as intelligently as they willingly do for the hope of reward. If proof of this be needed it may be found in the multiplication of profit-sharing schemes which is so outstanding a feature of industrial life to-day.

Co-operation, trust, confidence, enthusiasm—these are the qualities which lie at the root of all commercial success.

It may well be that the halcyon days of the telegraphs are gone forever, yet I cannot but think that a clear apprehension of the principles here set forth—and I am sensible they are by no means exhaustive—would, in the hands of a wise and sympathetic administration, go far to re-establish the service in public favour and to reduce that annual deficit which is the *bête-noir* of successive Postmasters-General.

MENSANO.

THE INSTITUTION OF POST OFFICE ELECTRICAL ENGINEERS: BOOTH-BAUDOT AWARD.

THE Council wishes to call attention to the "Booth-Baudot Award" of £5 which is now offered annually for the best improvement in Telegraph, Telephone or Wireless Apparatus or Systems. The award for the year 1928 is governed by the following conditions :—

1. The Award will be restricted to employees of the British Post Office.

2. Applications for the Award should be made between Jan. 1 and March 31, 1929, and such applications should refer to improvements made, or suggested, during the twelve months ending 31st December, 1928.

Attention is drawn to the fact that recipients of Awards *via* the Post Office Awards Scheme in respect to any improvement in telegraph, telephone or wireless apparatus or systems are eligible to apply for the Booth-Baudot Award in respect thereto.

3. The Award may be withheld at the discretion of the Council of the Institution of Post Office Electrical Engineers if, after full consideration of the applications received, the adjudicators appointed by the Council are of the opinion that no award is warranted.

4. Applications for the Award, accompanied by full details of the improvement, should be addressed to the Secretary, The Institution of Post Office Electrical Engineers, G.P.O. (Alder House), London, E.C.1.

R. V. HANSFORD,
Secretary.

December, 1928.

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TELEGRAPHIC MEMORABILIA.

AUSTRALIA.—Short-wave wireless messages from the Sydney (Australia) broadcasting station were recently clearly received at Berlin on a wavelength of 29 metres between 5 and 6 o'clock.

The number of paid words handled by the Post Office beam service in both directions between this country and Australia averages between 180,000 and 200,000 a week, about 17,000 paid words have been transmitted from Australia by the beam service and about 10,000 by the Post Office Imperial cables in connexion with the first cricket test match.

AUSTRIA.—"Radio-Austria" has inaugurated a direct radio-telegraph service to Egypt on Dec. 1.

Massage and Radio!—In a Bill shortly to be brought before the Austrian Parliament there will be clauses making punishable the use of high-frequency apparatus for massage or other purposes in such a way that the reception of radio broadcasting is interfered with..

BOLIVIA.—*The Electrical Review* reports that the South American Republic of Bolivia, with a population of 2,599,000, has now 7,150 miles of telegraph wires and 3,589 miles of telephone wires in operation.

CHILI.—From Santiago, through Reuter's Trade Service, we learn that a powerful wireless telegraph station, just completed at Quilicura, 30 kilometres from Santiago-de-Chile, will be able to communicate with the whole world. The station belongs to the Compania Chilena Transradio.

CHINA.—Reuter's Shanghai agency cabled to the *Daily Telegraph* on Nov. 10 to the effect that a wireless traffic agreement was signed by Chang Chin-Kiang, Chairman of the National Reconstruction Council, representing the Nationalist Government, and Mr. Tyrrell, on behalf of the Radio Corporation of America, on Nov. 10. The preamble of the agreement states that the council contemplates the early erection of a station at Shanghai, for commercial communication with the Radio Corporation's stations in America. Both parties desire to operate direct a radio circuit between the United States and China for the purpose of furnishing a manual high-speed automatic duplex commercial service. Practically an identical agreement (within their respective spheres) was also signed by Chang Chin-Kiang and Herr Kohen, representing the "Transradio," of Berlin.

DUTCH EAST INDIES.—A Bill has been introduced in the Dutch Parliament, says Reuter, from Amsterdam, for extending various items in the Dutch East Indian Budget for 1928. One of the principal clauses consists of an increased credit of 330,000 florins (£27,500) for the Post and Telegraph Department to cover expenditure in the East Indies, including 75,000 florins (£6,250) as the first instalment towards the cost of erecting a powerful short-wave transmitter with a capacity of 600 kw., which will permit of five direct wireless telegraph connexions with Europe and simultaneously two or three wireless telephone connexions during a period of from eight to ten hours per day. The estimated total cost of the new installation, which it is hoped to complete by January, 1930, will be 980,000 florins (over £80,000). It is also proposed to erect installations for short-wave traffic with America, for which in 1929 a further expenditure of 300,000 florins (£25,000) will be necessary.

The Nederlandsche Kabelfabriek Maatschappij, of The Hague, is increasing its capital from 2½ to 5 million guilders (from approximately £208,300 to £416,600).

EAST AFRICA.—It is recorded by *The Electrical Review* that on Nov. 11 short-wave transmissions from (7LO) Nairobi were inaugurated. The short-wave transmitter operates on a wavelength of 33.5 metres, using a power of 2 kw., and the programme broadcast daily from 4 p.m. to 7 p.m. G.M.T. on the long wave of 400 metres will be simultaneously transmitted on the short wave.

FRANCE.—It will be noted that while picture telegraphy is making some headway, television is not yet well to the fore. Thus *World Radio* says that tests of picture transmission on the Bélin system are being carried out by Radio-Toulouse broadcasting station. From January, 1929, a picture service will be linked with broadcast opera, for the station intends to transmit photographs of the artists taking part in operas relayed from the Theatre du Capitole, i.e., not *moving* figures.

The Electrical Review is our informant that a merger of the radio and transatlantic submarine telegraph services is reported to be impending in France somewhat on the lines of the merger proposed to be carried into effect in Great Britain. Radio France, which controls radio communication with Britain, Austria, Spain, Rumania, Norway, Yugo-Slavia, and Czecho-Slovakia, and is attempting to establish communication with the United States through the Saint Assisi station, is reported to be negotiating an agreement with the French Cable Company, which controls the cables to the United States via the Azores. The proposed merger is regarded as the reply of France to the British proposals and the extensive schemes in the United States for the concentration of radio and cable communication under one control.

An alleged ingenious use of a secret wireless installation to assist them in exchange speculations has led to the prosecution before the Twelfth Correctional Chamber of four foreign financiers and two French operators.

It is asserted that during the summer of 1926, when the franc reached its lowest ebb, two Exchange agents had a secret wireless transmission set installed in a private house. They also had a special telephone line connecting directly with an Exchange agent operating on the Bourse. They were thus able to inform their correspondents in Berlin and Vienna of the exchange rates of pounds sterling and dollars in Paris several minutes before the news reached foreign Bourses by ordinary means of communication.

This small advance was so important that it enabled the two financiers and their associates to conduct large operations with the least risk of loss. The charge against the accused is one of illegal competition with the State monopoly of posts and telegraphs.

Later the Central News reports that one at least of those accused of having set up a clandestine wireless transmitting station for use in connexion with speculation in francs, has been found guilty.

He has been sentenced to one year's imprisonment and a fine of 5,000 francs.

GERMANY.—Another example of picture transmission is to be found in the fact that the Königswusterhausen broadcast telephony station made its first experimental transmissions of pictures on the Fulton system on Nov. 20, from 9.45 to 10.15 p.m. G.M.T. Subsequent transmissions are to be made at the following times: Sunday, 12.45-1.30 p.m.; Monday, Wednesday, Thursday and Saturday, 12.45-1.15 p.m.; and Tuesday and Friday, 9.45-10.15 p.m. G.M.T.

GREAT BRITAIN.—*Middlesbrough.*—Apparently the announcement made about the middle of November by one of the wireless periodicals was not exactly correct when it said that the Corporation Electricity Department was manufacturing radio-receiver battery eliminators for sale to its consumers on the instalment system. The fact is that, although they have been designed under the direction of the Corporation, the outfits are being supplied by a well-known manufacturer of wireless and electrical apparatus and are being purchased by the Corporation.

The British Broadcasting Corporation announced some two months ago that during November and December ten relay stations would take over the national exclusive frequency of 1,040 kilocycles (288.5 metres). The necessity, however, of installing elaborate apparatus has led to the postponement of the scheme, and it is now announced by *The Times* that it will not come into operation until the early spring. Later news says during the current month.

Radio Beacons.—The installation of wireless beacon stations round the coasts of the British Isles is proceeding rapidly. The Marconi Company has already erected six stations, which are now in use, and seven more have been ordered. Among those now in operation, the Mersey Bar, Coningbeg and Spurn stations are on lightships, while those at the Skerries, Round Island and the Casquets are on land. The next seven stations to be erected, for which apparatus is now being constructed, are at Start Point, Lundy Island, Sule Skerry, Dungeness, South Bishop, Kinnaird Head and Cromer; beacon transmitters are projected also for Tory Island and Mizen Head. By the provision of submarine signalling apparatus in conjunction with a wireless transmitter, simultaneous signals can be transmitted in two different media; this system is used at the Spurn and Coningbeg light vessels. Since the speed of propagation of wireless signals is practically instantaneous, while that of submarine signals is approximately 0.8 sea mile per second, the two signals are heard at different moments, the time elapsing between the receipt of the wireless and submarine signals being a measure of the observer's distance from the transmitting station. In order to facilitate reception of wireless and submarine signals one side of the head telephone receivers is connected to the wireless receiver and the other to the submarine signal receiver. The use of a direction finder also enables a determination of position to be made with the aid of a single signalling station.

Special to Wireless Operators.—The Merchant Shipping (Wireless Telegraphy) Rules Amendment Rules (No. 2), 1928, dated Nov. 15, 1928, made by the Board of Trade under the Merchant Shipping (Wireless Telegraphy) Act, 1919 (9 and 10 Geo. 5, c. 38), which comes into force on Jan. 1, 1929, provides that the following shall be substituted for paragraph (*a*) of Rule 15 of the Merchant Shipping (Wireless Telegraphy) Rules, 1927 (*a*), viz.: "(*a*) A first-grade operator is one who holds the Postmaster-General's first-class certificate of proficiency issued under the provisions of the International Radio-telegraph Convention (London), 1912, or the Postmaster-General's first- or second-class certificate of proficiency issued under the provisions of the International Radiotelegraph Convention (Washington), 1927, and who has had three years' experience as an operator at sea, of which period two years shall have been in a ship where fixed hours of watch are kept."

Marconi's Wireless Telegraph Co., Ltd., says the *Electrician*, announces that the beam wireless stations successfully withstood the test of the heavy November gales. The safety devices included in the design of the aerial system have worked perfectly, and where interruption in the services has taken place it has been due to interruptions in land-lines, the stations being able to communicate between themselves throughout the gale. This, we understand, continues the *Electrician*, was rendered possible by the special design of the aerial wires at the beam stations, which, normally tightly strained, are so arranged that when the wind reaches hurricane force and undue strain is placed on the masts the tension of the wires is automatically reduced at the lower end. This is of course quite apart from fading period effects.

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A propos of this matter *The Electrical Review* directs attention to a letter written by the Postmaster-General to *The Times* on this subject, as follows: "Your leading article . . . does less than justice to the standard of pole line construction adopted by the Post Office . . . reports of the engineers show that the damage caused by the direct effect of wind pressure upon poles and wires was practically nil. In almost every case in this country the interruption was due to damage either by falling trees, or occasionally by dismantled roofs and broken chimneys, and in the case of the French circuits to a subsidence in a French road, which broke the underground cable."

Statistics published in the current *Wireless Trader* show that during September radio apparatus valued at £80,870 (valves £12,834) was exported from this country. Australia took £12,248, including valves £3,121. Italy £11,059 (valves £18), Sweden £8,860 (valves £1,152), the Netherlands £7,678 (valves £182), the United States £2,968 (valves £1,032), France £2,553 (valves £192), Argentine £2,483 (valves £7) and Jugo-Slavia £2,186.

Rochdale.—Wireless receiving and transmitting sets have been installed on the Rochdale fire engines. Various tests have all been successful, and constant communication with headquarters has been maintained from all parts of the town while travelling at high speeds.

Westminster.—The General Purposes Committee of the Westminster City Council have taken up the matter regarding nuisances caused by the installation of wireless loudspeakers. The nuisance arising from the use of such instruments in private houses, in the opinion of the Home Secretary, was not one which could be made the subject of a by-law. The committee recommends the framing of a by-law similar to that already sanctioned for East Ham, which entails a maximum penalty of £5.

Parliamentary Questions, Replies, &c.—On Nov. 13 Mr. Malone asked the Postmaster-General whether his department had considered the position of television; whether he considered it was necessary to revise the present Wireless Telegraphy Acts; and whether, if the Royal Charter granted to the British Broadcasting Company did not include the transmission of photographs by such methods as the Fultograph process, any application had been received to increase the scope of the power of the British Broadcasting Company to include television.

Lord Wolmer, who replied, said that he did not consider it necessary to revise the Wireless Telegraph Acts or the Royal Charter of the British Broadcasting Corporation. The question whether any modification was desirable in the terms of the Corporation's licence was at present under consideration.

On the same date Sir William Mitchell-Thomson informed Mr. Day that the number of wireless receiving licences in force on Oct. 31 last was about 2,543,000. [The number on Nov. 30 was 2,578,000 approx.]

On Nov. 19, Mr. Pilcher asked the Postmaster-General if he would state the capital cost of the four beam transmission stations erected, respectively, for the Australian, Canadian, Indian and South African services.

Viscount Wolmer said that the total cost of the four beam stations was approximately £242,200.

Replying to a further question by Mr. Pilcher, Viscount Wolmer said that on the Australian service during the first 52 weeks of its operation 7,306,000 words were handled; on the Canadian service 4,591,000; on the Indian service 10,078,000; and on the South African service 8,375,000. During the first complete week of operation of each service, the number of paid words handled was 53,000, 59,000, 115,000 and 88,000, respectively. During the week ended Nov. 11, 1928, the respective totals were 181,000, 113,000, 253,000 and 200,000.

Replying to an inquiry regarding external beam wireless telegraph services operated from this country in addition to the four Imperial services worked by the Post Office, the Postmaster-General stated that beam services are operated from this country by the Marconi Co. to the Argentine, Brazil, the United States and Egypt. The first two of these came into operation on Aug. 5, 1927; the United States service on Oct. 28, 1927, and the Egyptian service on Jan. 15, 1928. The transmitting station in this country for all four services is at Dorchester and the receiving station at Somerton (Somerset).

The Postmaster-General also announces instructions for official redirection of fully addressed telegrams, due to a change of address, are now recorded free of charge for three months (and for a fee of £1 1*s.* per annum if continued beyond three months), unless redirection involves transmission of the telegram to another town or other additional service, in which case the telegraph charges at present applicable will continue to be payable.

The Institution of Electrical Engineers.—Wheatstone and Volta.—At its ordinary meeting on Dec. 6, Sir George Sutton, Bt., presented to the Institution an oil painting of Wheatstone, by Sir William Llewellyn, K.C.V.O., R.A., and Mr. R. W. Paul presented an oil portrait of Volta, painted by Signor G Palanti, of Milan, both of which have been hung in the lecture theatre. Lieut.-Col. K. Edgcumbe, T.D., R.E.T. (Ret.), President, accepted the gifts on behalf of the I.E.E. Council.

GREECE.—According to the recently issued official report for 1926 there were 11,600 miles of telegraph lines in operation in Greece at the end of that year, 1,843 miles running along the railways and the remainder along the roads. The lines represented a total length of wire of 29,968 miles.

IRISH FREE STATE.—The imports of electrical goods, excluding machinery, into the Irish Free State during October last amounted to £72,062, bringing up the total for the first ten months of the year to £410,003, as compared with £310,470 in the corresponding period of 1927.

The Post Office authorities, says *The Electrical Review*, are taking steps to establish a wireless-telegraph station at Fleetwood to operate when communication by means of submarine cable either with the Isle of Man, or Ireland, is interrupted.

ITALY.—A new broadcasting station, of 50 kw., is to be erected in Rome and is to be ready by Oct. 28, 1929, says *The Electrical Review*. *The Times* adds that it is proposed to erect by the same date a short-wave station for transmitting Italian programmes to America and the Italian colonies.

JUGO SLAVIA.—The Exchange agency at Berlin reports the completion of the new Jugo Slavian broadcasting station near Laibach. Wavelength 566, call, that of the cuckoo, so it is said!

NATAL.—A court of inquiry at East London into the foundering of the *Cariboo*, which was sunk off the Natal coast, declared that no blame attached to the captain or officers, but recommended that the authorities should take steps to improve the wireless facilities at East London.

Reuter's Trade Service at Lima states that the new wireless station (OAX) opened near Tumbes (Provincia Litoral), Peru, bordering on Ecuador, is the 15th to be erected in the Republic; it forms part of the Government communication system and compares in power with the stations at Lima and Collao, which have a range of about 1,000 miles. A receiving wavelength of 600 metres is used with transmission waves of 600, 1,500, 3,000, 3,500, and 4,000 metres.

SWEDEN.—About Christmas time the Malmö station will be replaced by a new one at Hörby in Skane, having a power of 20 kw.

SWITZERLAND.—Reuter's Geneva correspondent advises that the recent trials of wireless communication undertaken by the Secretariat of the League of Nations with different parts of the world were carried out on short waves, and, in reply, 92 reports have been received by the Secretariat classified as follows: in seven cases reception was bad; in 18 cases it was fair; in 29 cases reception was good, and excellent in 38 cases. In view of the success obtained, the Secretariat has decided to continue the trials. An effort will be made to reach more particularly the American Continent, north and south, Japan, Australia and New Zealand.

The short-wave station of the Netherlands Government at Kootwijk will be used, says *The Times*; it will be coupled to a small studio at the Palais des Nations in Geneva by means of a telephone cable circuit between Switzerland and Holland. The reports on the previous experiments in which Kootwijk took part suggest that the wavelength then employed (18.4 metres) was particularly suited for reception in the Netherlands East Indies, South Africa, East Africa, and the southern part of the Indian Ocean.

U.S.A.—According to *World Radio*, Mr. C. P. Edwards, Canadian Director of Radio, has been informed by Mr. O. H. Caldwell, of the Federal Radio Commission, that under the new allocation system, which came into effect on Nov. 11, "no station in the United States on a channel shared with Canada exceeds 500 watts power," and that "no station within approximately 250 miles of the border is using more than 250 watts." On United States-shared channels the Commission has established a policy of granting three times the night power for use during daytime until sundown.

Wave-control.—An automatic device is to be used by the Federal Radio Commission, says Reuter's New York Agency, to keep broadcasting stations in their assigned channels. Mr. Arthur Batcheller, Federal Radio Supervisor for New York, says that "secondary standards" are to be installed in the sub-treasury at New York and in the Custom House at Boston, which will show visually when a broadcasting station is deviating from its allotted wavelength and the extent of deviation; only 500 cycles of variation is permitted.

Broadcasting Without the Ether!—An interesting transaction is recorded in the technical press foreshadowing the lines on which broadcast radio-telephony in the United States is expected to develop: by a deal involving a large transfer of patents the North American Company, one of the largest suppliers of electric light and power in the United States, has granted the Kolster Radio Corporation title to no less than 600 of its patents, in return for exclusive licences in the field of wired-radio to one of its subsidiaries, Wired Radio Inc. The patents concerned include the fundamental patent for "chain broadcasting," as well as patents for television and talking motion pictures. The significance of the transaction is the fact that within the coming decade most of the broadcasting in the United States will, it is predicted, be carried on over household electric light and power wires, the air being left clear for commercial and safety communications; in this way the worst of broadcasting difficulties will be overcome. The Kolster Radio Corporation has also received from the North American Co. a contract to manufacture for Wired Radio Inc. not less than one-third of its apparatus requirements, the value of the business which it will receive in this way being estimated at approximately £7,200,000 per annum. The North American Co. is already fully equipped to enter the wired-radio field.

One cannot be certain that the following is actually television as understood this side of the Atlantic. A committee appointed by the Radio Manufacturers' Association of the United States has recommended that all "radiovision" pictures at present being broadcast be standardised, so

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that one receiver with one scanning disc will be able to receive any of them. The committee's standard is the system used by Mr. C. F. Jenkins in Washington. The method recommended uses 48 lines with 15 separate pictures (frames) every second. *The pictures, therefore, will not show much detail, being decidedly inferior in this respect to the pictures which Mr. J. L. Baird can broadcast from his laboratory, says* "Nature." It is expected that all the television broadcast stations in the United States will adopt this standard. [The italics are ours.—ED., *T. & T. Jnl.*]

General and Personal.—Private Companies.—The gross income of the Radio Corporation of America and its subsidiaries during the quarter ended Sept. 30 was $23,643,332, and the surplus profit $5,221,146, making the surplus profit for the first nine months of this year $9,745,924.

A quarterly dividend of 5*s.* (net) per share has been declared by the Globe Telegraph & Trust Co., Ltd., on the ordinary shares.

The Western Telegraph Co., Ltd., has also declared a dividend of 5*s.* per share free of tax in respect of the quarter ended Sept. 30 last.

The Marconi Royalties Appeal.—In the Chancery Division, on Nov. 20, Mr. Justice Tomlin was asked to fix a date for the hearing of the appeal of Marconi's Wireless Telegraph Co., Ltd., against the recent decision of the Comptroller-General of Patents. His Lordship said that his list included a number of lengthy actions taking precedence of appeals which would probably occupy the remainder of the term. In the circumstances he was unable to fix a date, but if one of the prior actions was settled a further application could be made.

For Our Advertisers.—Contracts Open.—Where not otherwise indicated, quote reference and apply Department of Overseas Trade, London, S.W.

Australia, Melbourne, Jan. 15. Department of Posts and Telegraphs. Telephone transformers (B.X. 4878); coil posts (B.X. 4879). Jan. 22—Telephonists' telephones (B.X. 4888); telephone transmitters and parts (B.X. 4889); telephone receivers and parts (B.X. 4890). Jan. 29—Accumulator batteries and counter E.M.F. cells (schedule C. 390) (B.X. 4906).

New Zealand, Wellington, Jan. 15. Posts and Telegraph Department. Telephone cords. (B.X. 4847). Feb. 12—Supply of V.I.R. wire D.O.T. Feb. 19—Supply of bronze wire and copper wire and of 120,000 galvanised steel spindles for insulators (D.O.T.).

South Africa, Pretoria, Jan. 24. Posts and Telegraph Department. Telephone switchboards (B.X. 4912).

India.—Stores Department, New Delhi, Feb. 5. Supply of turbo-alternator, boiler, economiser, switchgear and cables (B.X. 4944).

Promotions in the C.T.O.—Sincerest congratulations to Mr. Hunt upon his appointment to Asst. Supt., Inland, after his successful association with the Imperial Cables.

Also, in the Cable Room, to Mr. Rennie, who obtains a Provisional Overseership, and to Mr. A. E. H. Skinner, upon receiving the same qualified advance in the Service. Later on it is earnestly hoped the ratifications will follow.

Likewise to Mr. P. Nockles, whose "provisional" has been made "substantive."

With the closing of the year there passed away the much-respected Mr. A. J. O'Donnell, Overseer in the Inland Department of the C.T.O., the victim of a malignant disease. A most capable officer, and modest withal, Mr. O'Donnell formed one of a small band of Inland telegraphists who in the early days of the war, volunteered to journey to an unknown destination "Somewhere in Russia," and who, as a sequel, disappeared for many weeks then suddenly came through to the C.T.O. by a long and circuitous circuit of submarine cable and land lines, from the not too hospitable coast of Murmansk.

It was specially sad that practically on the eve of his 60th year there should pass out of our sight so faithful a friend and colleague. To his sorrowing relatives are offered the sincerest expressions of sympathy.

We have received a very useful tear-off calendar from Messrs. Siemens & Schuckert, and as usual the monthly issue, tastily presented, coloured calendar from Messrs. Creed & Co., old friends of the Telegraph Service.

The 1928 Christmas card from the F Division, as representing the C.T.O., London, has this season struck out a new line in its issue under the aegis, as usual, of Messrs. Johnson & Young, of *The Lost Office Circular*." This is easily a happy skit on the official weekly publication with which all Post Office servants are familiar. Printed on superfine paper, with a two-colour front page, this "Christmas number" of eight pages is a credit to the printers, Messrs. Baines & Scarsbrook, who have well entered into the spirit behind the production, which one may truthfully say is one of "naught set down in malice."

I understand that the whole issue of five hundred copies has been disposed of and there is still a cry for more.

One cannot better close these New Year notes than by quoting one of the author's quotations from a prayer of R. L. Stevenson :—

> "The day returns and brings us the petty round of irritating concerns and duties. Help us to perform them with laughter and kind faces."

J. J. T.

PROGRESS OF THE TELEPHONE SYSTEM.

THE total number of telephone stations in the Post Office system at Oct. 31, 1928, was 1,696,205, an increase of 8,930 on the total at the end of the previous month.

The growth for the month is summarised below :—

	London.	*Provinces.*
Telephone Stations—		
Total at Oct. 31	603,046	1,093,159
Net increase for month	4,043	4,887
Residence Rate Subscribers—		
Total	141,645	224,670
Net increase	1,456	1,936
Call Office Stations (including Kiosks)—		
Total	5,450	19,800
Net increase	21	139
Kiosks—		
Total	1,158	4,632
Net increase	39	133
Rural Party Line Stations—		
Total	—	10,293
Net increase	—	—
Rural Railway Stations connected with Exchange System—		
Total	—	1,009
Net increase	—	26

The total number of inland trunk calls dealt with during August, 1928 (the latest statistics available) was 9,217,489, representing an increase of 698,833, or 8.2% on the figure for the corresponding month of the previous year.

Outgoing international calls in August numbered 32,972 and incoming international calls 37,210, representing increases of 8,398 (34.2%) and 10,569 (39.7%) respectively, over August, 1927.

Further progress was made during the month of November with the development of the local exchange system. New exchanges opened included the following :—

LONDON—Monument and Mansion House (automatic),

PROVINCES—Bearwood, Bromborough,

and among the more important exchanges extended were :—

LONDON—Sydenham, Wembley, Wimbledon.

PROVINCES—Bilston, Crosby, High Wycombe, Idle, Openshaw, Paisley (automatic), Shettleston, Stansbridge.

During the month 78 new overhead trunk circuits were completed, and 84 additional circuits were provided by means of spare wires in underground cables.

A RESPONSE TO A CALL FOR "HELP!"

OUR correspondent, Mr. H. MORGAN, of the London Telephone Service, reports that, as a result of the article entitled "Help!" which appeared in the September issue of the *Journal*, two Field Officers on development work have tried their hand at canvassing work with conspicuous success. When examining "distribution areas" they have from time to time mentioned the advantages of the service to potential subscribers. During October and November these two officers in the course of their ordinary work obtained actual orders for 16 business-rate lines, 1 residence-rate line and 6 extension lines, besides promises from some 9 people to join the telephone system at once, and another dozen promises to consider the question in a few weeks' time. We consider this a remarkable effort for "amateur" contract officers, and also evidence that the *Journal* has an influence which is not always fully appreciated.

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A BRIEF CHRONOLOGY FOR STUDENTS OF TELEGRAPHS, TELEPHONES AND POSTS.

BY HARRY G. SELLARS.

(*Continued from page* 60.)

1874, Oct. 19... Granfeld, of Vienna, applied the Hughes correction to Meyer's telegraph distributor.

Willot, of France, replaced Meyer's recorders by ordinary ink-writers.

Elisha Gray experimented with the transmission of sounds, introducing an induction coil into his apparatus.

Alexander Graham Bell assisted by Charles Sumner Tainter, constructed an apparatus for transmitting sounds by utilising luminous rays and selenium.

Thomas Alva Edison devised a method of quadruplex telegraph working.

W. Clauson-Thue published the *A.B.C. Universal Commercial Electric Telegraphic Code.*

1875, Jan. ... Baronio invented the "Stenocode" for the purpose of increasing the traffic capacity of long cables.

1875, Feb. 23 Elisha Gray, of Chicago, filed a specification of an invention for transmitting musical sounds.

1875, Feb. 25 Alexander Graham Bell, of Salem, Massachusetts, filed an application for a patent for two methods of producing intermittent currents.

1875, April 6 Bell patented an apparatus for transmitting two or more telegraphic signals simultaneously.

1875, June ... Bell's telephone invented. Thomas Augustus Watson assisted Bell in his experiments with the telephone. Charles Williams, of Boston, Mass., manufacturer of telegraph and electrical apparatus, constructed models under Bell's direction.

1875, June ... French Government accepted Baudot's invention and carried out trials.

1875, July 1 ... International Postal Union came into operation.

1875, July 27 Elisha Gray granted a patent for an invention for transmitting musical sounds.

Committee appointed to inquire into the financial state of the British Telegraph Service.

1875, Sept. 21 Public demonstration of Bell's telephone at Brantford.

1875, Oct. 19 Sir Charles Wheatstone died.

International Telegraph Conference at St. Petersburg. Code and "Urgent" telegrams permitted.

Travelling Post Offices in Great Britain placed under the control of the Circulation Office (now the London Postal Service), with the exception of a few controlled by Surveyors.

1876, Jan. 1 ... France entered the International Postal Union.

Number of British registered letters reached 5,000,000.

1876, Feb. 14 Bell filed an application for a patent for an apparatus for transmitting vocal sounds. An hour or two afterwards Elisha Gray filed a specification of a similar invention.

1876, Mar. 7 ... Bell granted a patent for an apparatus for transmitting vocal sounds.

Sir Oliver Lodge maintained that a lightning flash was an electric oscillation rather than a current. He designed a lightning protector for submarine cables.

W. H. Preece and J. Sivewright published *Telegraphy.*

Bell Telephone Association formed in America.

Ruhmkorff invented a current reverser, or Commutator, and improved Mason's Induction coil.

Apps, Callan, Henley and Page devised various types of induction coils.

Paul Jablochkoff made a battery composed of plates of carbon and iron in fused nitre.

1876, June 25 Bell submitted his telephone to Sir William Thomson (Lord Kelvin).

Telephone transmitter and receiver exhibited by Bell in Philadelphia. At a meeting of the British Association in Glasgow, Sir William Thomson gave an account of the results obtained by Bell and exhibited the receiver.

Sir Oliver Lodge and Paalzow proved the theories of Riess and Henry relative to discharge of a Leyden jar.

Gerritt Smith introduced the polechanger and compound relay in quadruplex telegraphy.

William Slingo (afterwards Sir William Slingo) opened the Telegraphists' School of Science in Aldersgate Street, London. "Studying Slingo" has been for many years the London telegraphist's method of intimating that he has taken up a course of technical study.

1876, Dec. 9 ... Bell patented his telephone in England.

William Crookes invented a radiometer.

Special adhesive stamps issued for prepayment of telegram charges.

16,000,000 Money Orders issued.

1877, Mar. 3 ... R. S. Culley, Engineer-in-Chief to the Post Office, reported that he had not seen Bell's telephone.

John Christie published a *Manual of Telegraph Construction.*

Stores Department, Telegraphs, formed and Controller of Stores appointed.

(*To be continued.*)

CHRISTMAS GREETINGS BY TELEGRAPH.

IT was reported to us on Christmas Eve that up to noon on that day some 30,000 Christmas Greetings telegrams had been received and forwarded over the beams working to Australia, South Africa, India and Canada and over the Imperial Cables working with Canada and Australia. This work was still coming in freely, and the total Christmas Greetings traffic over these routes promised to reach between 40 and 50 thousand messages. In addition, a large volume of Greetings traffic was also being handed over to the Post Office to deal with from the various cable companies.

For the first time a Christmas and New Year's Greetings service has been arranged with a number of Continental countries, and the service is being fairly freely used.

A feature of this year's traffic is the large number of reciprocal greetings being passed between banks and business houses.

The Christmas and New Year's Greetings facilities are now world wide, extending from the remotest northerly parts of Canada to the smallest places in Australia, and embracing such isolated places as the Falkland Islands, Norfolk Island, Rodriguez—in fact, practically all parts of the world.

PRIZE-GIVING: GIRL PROBATIONERS (LONDON TELEPHONE SERVICE).

A DIGNIFIED and interesting little ceremony took place in the Conference Room at Cornwall House on the afternoon of Dec. 5.

The Conference Room sees varied scenes, none more heartening than this gathering of the youngest girl members of our great Service to receive the prizes earned by their work at the Baltic Street Continuation School. Mr. Valentine, after giving particulars as to the number of girls who had obtained appointments as telephonists, telegraphists and sorting assistants, distributed the prizes. As each prize-winner advanced Mr. Valentine read the report given her by the Principal of the School. He congratulated the girls on their good fortune in attending the School with such a Principal (Mr. Law). Mr. Valentine asked how many of them had noticed the number of stations now connected in the London Telephone Service which those who were observant would see at the Waterloo Road entrance. In speaking of the growth of the automatic service he impressed upon the girls that there was no truth in the rumour that no more telephonists would be required. On the contrary it had been estimated that during the next ten years there would be no diminution in the number of telephonists required and they could tell their friends that they might still obtain appointments as telephonists. The automatic working had taken away the simpler and less interesting duties of the telephonist. He wanted them all to realise the greatness of our service which had been made possible by a discovery some 50 years ago by Alexander Graham Bell and T. A. Watson. He told them he had recently met Mr. T. A. Watson, and went on to explain how the great discovery had been made.

After words of thanks to the Controller for his inspiring talk and a fine clapping of hands as an appreciation from the girls, proceedings closed.

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LONDON TELEPHONE SERVICE NOTES.

Contract Branch.

THE volume of business done by the Contract Branch during the month of November showed a distinct improvement on the corresponding month last year as indicated by a net increase of 6,064 stations this year, as compared with 5,019 last year.

Now and then we get amusing evidence of the ideas some individuals hold as to the duties of the Telephone Service. Recently, on keeping an appointment made on one of the advertising postcards, the Contract Officer found that the applicant had never had any idea of ordering a telephone, but wanted his wireless set overhauled and thought that his 10*s.* for a licence included maintenance ! !

Some people are still very reluctant to have telephones in their homes, and contract officers must come across many amusing reasons for refusals. One man recently would not listen to any argument and refused all the advantages of service, because he considered it would be conducive to his wife taking less exercise than she ought to ! ! !

The London Telephonists' Society.

On Friday, Nov. 23, 1928, the third meeting of the current session of the London Telephonists' Society was held in the Lecture Hall of the City of London Y.M.C.A., 186, Aldersgate Street, E.C.4.

Tea was served in the ante-room for half-an-hour prior to the meeting, when members from various exchanges and offices had the opportunity of exchanging news and views with their colleagues.

The subject chosen for the meeting was a lecture, entitled "The Early Development of Telephone Switching." The lecturer, Captain F. G. C. Baldwin, who had very kindly travelled from Newcastle-on-Tyne in order to speak before the Society, is not only a great authority on the subject, he is an extremely able and interesting lecturer, who was able to completely hold the attention of an audience almost wholly non-technical. Capt. Baldwin illustrated his lecture with lantern slides of great interest; which made one more acutely realise the tremendous speed with which telephony has developed; and it was obvious that the ladies present also appreciated the opportunity they thus received of comparing the clothes of to-day with the voluminous drapery of nearly half a century ago.

At the conclusion of the lecture, the Controller, in proposing a vote of thanks to Captain Baldwin, expressed the feelings of all who were present.

On Saturday, Jan. 26, 1929, the Annual Supper and Dance of the London Telephonists' Society will be held at the Bishopsgate Institute, E.C. This event is always most popular, and as the number of tickets issued is strictly limited, an early application should be made to the Hon. Secretary, Miss E. McAllister, Regent Exchange, 32/3, Gerrard Street, Soho, W.1.

National Sanatorium—Benenden.

The first Concert, organised by the L.T.S. Staff, for this Season, was held on Saturday, Dec. 1, at the Sanatorium. The artistes were Misses Pidgeon, Logan, Dean, and Worth, and Messrs. Conyers, Harris, and Hugh Williams. The Concert was under the direction of Miss Worth, who, in addition to arranging these functions, works so strenuously for all that appertains to the "San." Patients, Staff, and Artistes all appeared to enjoy the evening; indeed, one poor fellow laughed so heartily at the humorous numbers of Charles Conyers and John Harris that he collapsed, and had to be carried out. During the interval cigarettes, chocolates, &c. were handed round to the patients by the Artistes on behalf of the L.T.S. Staff.

The Matron provided the party with tea and supper, and before leaving, the opportunity was taken of expressing the appreciation of the Artistes for the warm reception and hospitality received.

Many enquiries were made as to when the L.T.S. would be providing another Concert, and assurances were given that, thanks to the generosity of office and exchange colleagues, there would be several others during the Season.

Football.

The L.T.S. football club is now in its second season in the Civil Service League, 2nd Division, and its record for a new club would generally be regarded as satisfactory, but if promotion to the 1st Division is to be won, it is worth while taking stock of the players and enquiring whether the team is good enough for the job.

I believe it is, but like many junior clubs, results could be improved upon if the team would pay more attention to a study of the game and its movements.

Allowing for the limitations in junior football of ball manipulation, I have been impressed at various times by the absence of resource and understanding on the part of some of our players.

We hear a lot about the W formation adopted in higher grade football as a consequence of the alteration in the offside law, but I don't think we need pay much attention to that here. What one would like to see is the unexpected cross pass from an inside position to the opposite wing man which so often catches the opposing defence out of position. Our wing half-backs should cultivate lobbing the ball over the heads of the defending half and full back, and the wing man should be ready for this move; a throw in is often better utilised by dropping the ball to the feet of one of your own side, the half being ready for a quick return pass. I have seen goals sacrificed which could probably have been saved if the back pass to the goalkeeper had been exploited. I believe in the defence playing on top of the opposing forwards on the side of the field where play is proceeding, and falling back as the ball is worked across to the opposite wing. But perhaps the biggest mistake by some of our less experienced defenders is a tendency to back on their own goal before an attack of the opposing forwards. A properly judged move towards the man in possession of the ball has the two-fold advantage of (1) securing the ball by an effective tackle or (2) throwing your opponents offside if a pass is attempted.

It is also helpful, when in possession of the ball, to know the position of your opponents, and a colleague should not hesitate to offer a word of advice by calling out "man behind you," or "plenty on time," &c., &c. Passes are often made too hurriedly when considerable advantage could be gained by first "drawing" a man. A successful team generally owes more to "head work" than to footwork and speed.

The results of the last three matches have been as follows:—

v. War Office	Won, 4—1
v. Holloway Stores	Lost, 0—2
v. Ministry of Health	Lost, 1—3

Bowls.

A meeting of the London area committee of the Civil Service Bowls Association took place at Treasury Chambers on Wednesday, Dec. 12, 1928, and important business was transacted, which is of considerable interest to all bowling enthusiasts and particularly to the London Telephone Service bowls enthusiasts, whose representatives hold the London Area Rink Championship.

A resolution was carried that all the Service Clubs be organised in two divisions, the stronger clubs forming the 1st division and the rest the 2nd division. The two top clubs in the 2nd division will be promoted annually to the 1st division, and the two bottom clubs in the 1st division will descend to the 2nd division. To maintain the competition between Post Office clubs for the Bunbury Cup, all league matches between Post Office Clubs will count for this purpose, additional games being arranged where necessary between Post Office clubs not in the same division.

The initial distribution of the clubs between the two divisions will be performed by the Committee.

Another important recommendation adopted by the meeting is the formation of a "London Civil Service Bowling Club," which will affiliate to the Middlesex County Bowling Association.

One important effect of this will be that all departmental clubs will be affiliated through this newly formed body to the County Association, and individual members will be eligible to compete in a wide variety of events hitherto debarred to them. This departure, however, will raise many other interesting questions which no doubt will be the subject of criticism at the various service clubs meetings.

Much attention has been directed to the state of the Headquarters green during the winter, and it is expected that the conditions at Chiswick will be vastly improved in time for the commencement of the 1929 season.

Netball Competition.

The first round in the competition for the "Liddiard" Shield has been completed with the following results:—

Clerkenwell beat Riverside	44—3
Central beat Kensington (2nd)	22—5
Thornton Heath beat Chiswick	19—14
Holborn (2nd) beat Maryland	8—7
Controller's Office beat Kensington ...	29—7
Rodney beat Ealing	21—7
Holborn beat Western	14—8
Controller's Office (2nd), w.o. Rodney (2nd) Scr.	

The draw for the second round is:—

Clerkenwell versus Holborn.
Central versus Thornton Heath.
Holborn (2nd) versus Controller's Office (2nd).
Controller's Office versus Rodney.

Obituary.

The L.T.S., particularly the Traffic Branch, has sustained a grievous loss through the death of Mr. Frank Hooper, following upon a short illness. Mr. Hooper commenced his career with the National Telephone Company on the engineering side, being for many years on the maintenance side at Battersea. He transferred to the Traffic Staff a year or so prior to the transfer of the N.T.C. to the Post Office, and at that time was an Exchange Manager. In this capacity, and later as Assist. Superintendent of Traffic, he was from time to time in charge of different exchanges, notably Paddington, City, and lastly London Wall and Clerkenwell Exchanges.

He was extremely popular with the staffs under his control, and with his colleagues, and will be long remembered for his loyalty, fairmindedness, and kindness, amongst his many excellent virtues. In addition to his work in the Civil Service he played his part in sterner affairs, serving with the Cavalry in the South African War and in the Royal Flying Corps in the Great War.

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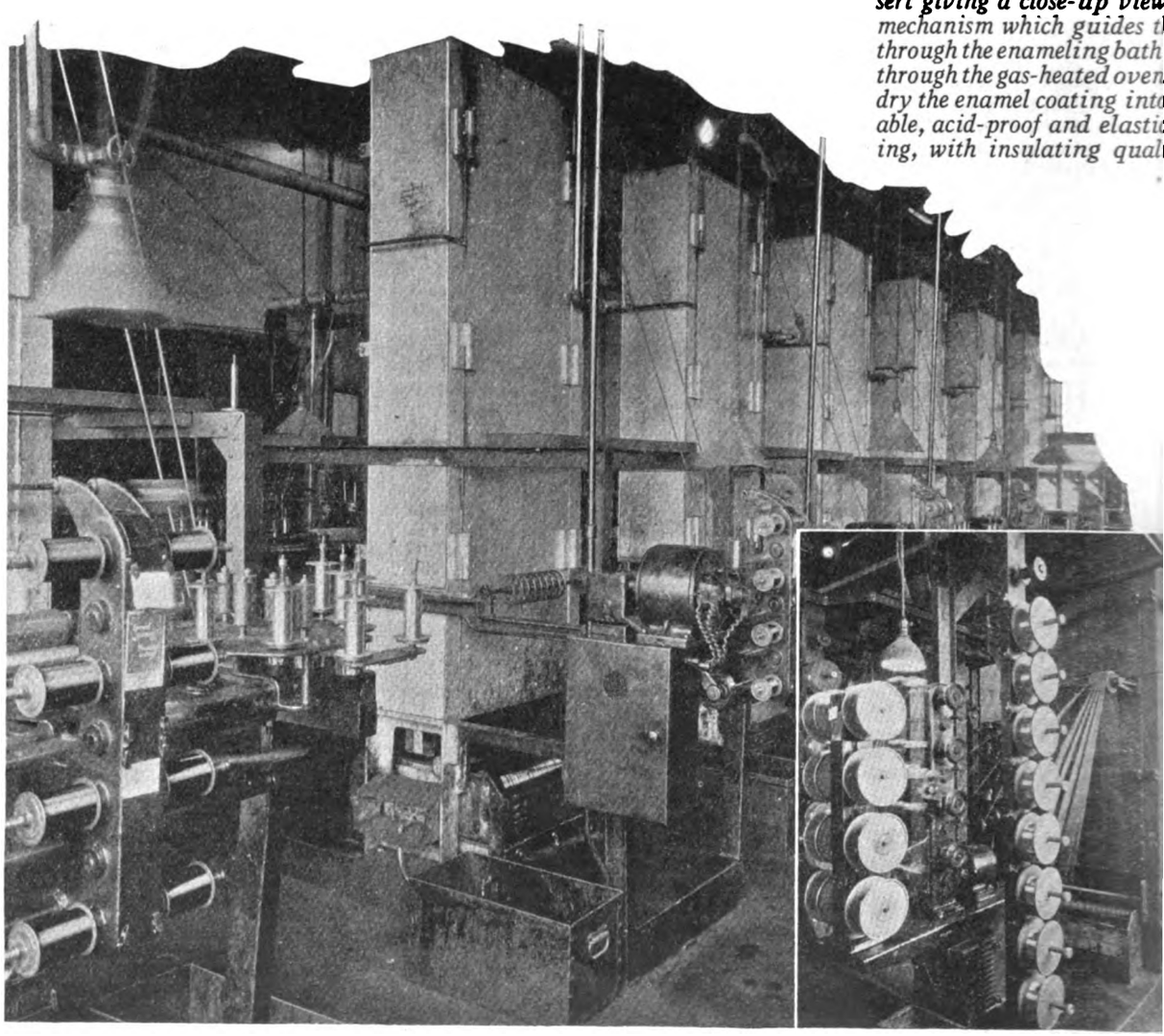
Maintaining Strowge

By Means of Special

The illustration shows a enameling machines, with sert giving a close-up view *mechanism which guides t through the enameling bath through the gas-heated oven dry the enamel coating into able, acid-proof and elastic ing, with insulating quali*



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Enameling Processes.

AUTOMATIC Electric Inc. was one of the first telephone equipment manufacturing companies to develop a satisfactory enamel coating for wire, and for more than twenty years has enameled its own wire in its own factories by means of its own specially developed processes. All copper wire used is held to the highest standards of purity, and every component ingredient of the enameling mixture must pass the most exacting tests for quality and purity before being accepted for use.

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[*This is one of a series of advertisements illustrating the exacting care exercised in the production of Strowger Automatic telephone equipment, which is thus kept constantly in advance of the telephone art.*]

Automatic Electric Inc.

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UTOMATIC

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The
Telegraph and Telephone Journal.

PUBLISHED MONTHLY IN THE INTERESTS OF THE TELEGRAPH AND TELEPHONE SERVICE, UNDER THE PATRONAGE OF THE POSTMASTER-GENERAL.

Editing and Organising Committee - - - J. STUART JONES. W. D. SHARP. J. F. STIRLING. W. A. VALENTINE. J. W. WISSENDEN.

Managing Editor - - - W. H. GUNSTON.

NOTICES.

As the object of the JOURNAL *is the interchange of information on all subjects affecting the Telegraph and Telephone Service, the Managing Editor will be glad to consider contributions, and all communications together with photographs, diagrams, or other illustrations, should be addressed to him at the G.P.O. North, London, E.C.*1. *The Managing Editor will not be responsible for any manuscripts which he finds himself unable to use, but he will take the utmost care to return such manuscripts as promptly as possible. Photographs illustrating accepted articles will be returned if desired.*

VOL. XV. JANUARY, 1929. No. 166.

THE TELEGRAPHS AGAIN.

WE are assured on all hands that the British telegraph service is in a bad way. The physicians cluster round the bedside and prescribe various medicines, usually very nasty. From time to time specialists are called in; they all find grave symptoms of disorder, but they cannot agree as to the best course of treatment; some advise a major operation, others doubt whether the patient's health will stand it.

Meanwhile, what does the patient think about it all? At times, perhaps, he thinks he is very ill, because so many eminent persons have told him so; at times he may suspect that the only thing that is wrong with him is the effect of the many medicines that he has had to swallow, and that if only people would let him alone, he would soon be on his feet again. But it is hard to find out what the patient thinks; for the British telegraph service has few opportunities of expressing its own point of view. Least of all are such opportunities normally given to those who are in the closest contact with the practical details of telegraph working.

In order to give a chance for "the man on the job" to express his views, we are arranging in this *Journal* for a series of articles, of which the first will appear in our February number. The title of the articles is "How to Improve the Telegraph Service." The contributors will remain anonymous (except for a general description); but we have spread our net fairly widely, and have succeeded in catching a Superintendent and a Sorting Clerk and Telegraphist in the Provinces (a hateful word, but difficult to avoid!); an Overseer and a Telegraphist in the Central Telegraph Office; an Engineer, a Traffic Officer, and a provincial representative of the Imperial Cable and Wireless services. Most of them have never contributed to the *Journal* before.

The articles will appear monthly, but the later articles will not be in any sense criticisms or elaborations of the earlier articles. They will be received here more or less simultaneously (at least, we hope so) about the middle of this month; and no contributor before writing his article will have seen what any other contributor has written. We do not want to avoid criticism,—in fact we are anxious to attract it; but we should prefer to leave the criticism to our readers, keeping the articles themselves as independent contributions. We shall be disappointed if the articles do not stimulate vigorous thought: and we hope that telegraph men and women will express their views freely in the form of letters to the Editor. (Letters will be published over a pseudonym, if the writers wish; but in that case a statement of the name, rank and office of the writer should be supplied to the Editor, though not for publication.)

In our November number we invited our colleagues on the Telegraph side to help us to ensure that telegraph matters should receive in the *Journal* the attention that they deserve. We know that in present circumstances telegraph men and women have reason to be discouraged; but we believe that beneath this discouragement there lurks a real pride in their craft and a confidence in the future of telegraphy, that have all too few opportunities for expression. This *Journal* is intended to act as a medium for the interchange of opinions on telegraph subjects: our readers can help us, by bringing the *Journal* to the notice of their colleagues, to make its appeal on the telegraph side more extensive; and above all, they may help to make our appeal more intensive by sending us their opinions on current problems. It is for these reasons that we specially commend this series of articles to the attention and co-operation of our readers.

The first of the series, which will appear in our next number, is by a Telegraphist in the Central Telegraph Office.

THE WORLD'S TELEPHONES.

We present in another column our annual review of the telephone development of the world at the end of 1927. As we remarked in connexion with the 1926 statistics, it presents no novel features. About a million and a half telephones were again added to the world's total, and again over 800,000 of these were provided by North America and about half a million by Europe. The rate of increase in Europe has fallen from 7 to 6.4%, while that of North America has fallen from 5 to 4%, but it will generally be found that as density of telephone development increases the percentage rate of increase tends to fall.

Attention may be drawn to some noteworthy facts in these interesting statistics. Of the 8½ million telephones in Europe more than half are to be found in Great Britain and Germany; of the

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million telephones in Asia, over 700,000 are in the Japanese empire; of the 187,000 in Africa about half are in British South Africa; of the total of nearly 20 millions in North America, 18½ are in the United States and 1¼ million in Canada; whilst of the 440,000 in South America exactly half are in the Argentine. The number of cities in the world with 10,000 telephones was nearly 300 at the end of 1927 and is doubtless above that number now; and of these, over 60 cities contain 50,000 telephones within their local areas.

If evidence were necessary of the importance of obtaining accurate telephone statistics up to as late a date as possible, it would be found in the fact that the telephone system of the world grows steadily at the rate of a million and a half a year. Consequently, figures which are only two years old—quite young ones, in fact, as official statistics go—fall short of the actual total at any given year by no less than three millions. The 20,800,000 telephones of 1920 had become 30,748,000 by the end of 1927.

HIC ET UBIQUE.

We learn that telephone service between London and Warsaw is expected to be opened early in January. The charge for a 3 minute day call will be 15*s*. 3*d*.

A writer in the *Daily Chronicle* says :—

> At lunch yesterday a man spoke highly of the automatic telephone; it served him very well, he said. At dinner a woman abused it to me with measureless annoyance. And they are both on the same exchange! My own experience of it in America and in Edinburgh recently has been fortunate. Of course, it is rather irritating, when you can't get a number, not to be able to speak sharply to someone. But I have almost always found that I could get the numbers I wanted. Is the failure of some of the grumblers due to their own faults, I wonder?

His heading, by way of comment, is "Not Fool-Proof."

It is reported that the Swedish-Finnish cable is so far completed that communication was opened between Stockholm, Norrtelje and Osthammar and Mariehamn, in the Aland Islands, on the 14th of last month. (The opening of service between Sweden and Finland is stated in the Press to have been inaugurated on Dec. 22.)

In Mr. Humbert Wolfe's recently published volume of essays, "Dialogues and Monologues," there is one on "Public Servants in Fiction." After reviewing the excursions of Dickens, Trollope, Rudyard Kipling, H. G. Wells, Arnold Bennett, E. V. Lucas and Edward Shanks into this field, Mr. Wolfe concludes :—

> You will see that the general view appears to be that what Public Servants serve is generally a double fault. But somehow they don't lose the set.

Commenting on the discussion in the House of Commons and in the Press as to the suitability of Welsh candidates for posts in London telephone exchanges, Mr. Caradoc Evans, the novelist, falls foul of the Welshman and Welsh voices and is reported to have said : "On the 'phone he is impossible. That is why I should think that in Cardiff and Swansea there are fewer telephone users than in any other part of Great Britain." This shows the danger of speaking without your book. Cardiff has the highest telephone development of any large city in Great Britain except London and Bournemouth.

On Nov. 6 last, telephone conversations were exchanged between Edmonton, Alberta, and Victoria, B.C., in order to mark the completion of the western link in the "All-Canadian" transcontinental telephone line. The completion of the new line not only enables Calgary, Edmonton, Vancouver, Victoria and other points in Alberta and British Columbia to converse with each other and with points in central Canada over all-Canadian wires, but with the last link between Quebec and New Brunswick nearing completion, forms an important link in a coast-to-coast service which is assured in the near future, with no foreign point touched.

According to a recent (June, 1928) official report on "Economic and Financial Conditions in Germany," Germany possesses 24 radio-transmitting stations, and the greatest attention is being devoted to the perfection of all types of radio. In August, 1927, a direct public radio-telegraph service was opened by the Transradio A.G. between Berlin and the Philippines (Manila); the rate is Mks. 3.20 per word for ordinary and 95 pfennigs for Press telegrams. For the time being Germany is dependent upon the London stations for radio telephony to the United States, but preparations are being made for a direct service with a transmitter at Nauen and a receiver at Beelitz. During the autumn radio-telephony between Berlin and Buenos Aires is to be opened. About the same time Berlin is to be connected with Mexico and Siam by short-wave radio-telegraphy and telephony. Towards the end of 1928 the large radio-transmitting station which is being built in Japan by German firms will be finished, so that sending will then be possible in both directions instead of, as now, only from Germany. In the meantime, experiments will be made in transmitting telephone messages and pictures with the Nauen short-wave sender to Tokio. While Germany's radio services with other countries are dealt with by the Transradio A.G., those within the country are under the Ministry of Posts, which is also substitutihg short-wave for long-wave installations. The police have ordered a number of portable short-wave sets with which country police on patrol can get into touch with headquarters at any time. The number of subscribers to the German broadcasting system was 2,000,000 at the beginning of 1928, an increase of about 500,000 during the year.

[The radio-telephone service between Germany and Buenos Aires was opened last month (from Berlin on Dec. 10, from other German towns Dec. 21), and is limited at the Argentine end to one specified station in Buenos Aires. We have no information as to the direct Siamese and Mexican services, but service to Mexico is, of course, already obtainable via London.—ED., *T. & T. J.*]

According to the *Times*, it is officially announced the public service between Amsterdam, Rotterdam, The Hague, and Utrecht, and the four leading towns in the Netherlands East Indies will be opened on Jan. 8. The minimum charge for an ordinary call booked two days in advance will be £2 10*s*. Special calls at a higher charge may be put through at once.

DEATH OF JOHN LEE.

As we go to press, we are informed of the death of Mr. John Lee, late Controller of the Central Telegraph Office and one of the original Editing Committee of this Journal. He died on Dec. 24 on board the liner *Laconia* on his way home from a tour in America, and was buried at sea. Before he retired, it was known that his constitution was impaired as a result of his unceasing activity and service; and that his strength was all too slight to sustain that vast spiritual force. His friends all over the world will mourn his loss, with a feeling of pride at the privilege of having been associated with him, and a confident belief that his indomitable soul goes marching on. To his wife and family, and to that wider family of his, his colleagues at the C.T.O., we offer our warmest sympathy.

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THE LONDON AUTOMATIC SYSTEM.*

BY M. C. PINK, ASST. CONTROLLER, LONDON TELEPHONE SERVICE.

VARIOUS articles on the question of Automatic Switching have appeared in the Service magazines and the newspapers have given a certain amount of publicity to the subject since the task of substituting automatic switching methods for those previously employed was commenced in the London area; and Mr. H. G. S. Peck dealt with many aspects of the subject from an engineering point of view in a most interesting paper given recently to the Institution of Post Office Engineers. No general review of the position has, however, been put before this Society, and it is my task this evening to attempt to make such a review. The subject is a very wide one and it will obviously be impossible to deal in detail with any particular phase. I propose however to show you statistics relating to the amount of traffic now handled by automatic plant and to tell you something of the measure of success with which this traffic is being handled. In the course of my remarks I shall touch on some of the difficulties experienced in connexion with this most momentous change and make a brief reference to the future.

The task of the Post Office in introducing automatic telephony in London was immense. It was necessary to ensure that when the first automatic exchange commenced to function, the subscribers on that exchange would be enabled to communicate with any one of a total of over 300,000 subscribers' lines without verbal communication with an operator. To render this possible plant had to be installed at practically all exchanges within 10 miles of Oxford Circus, which would respond to the dialling of any automatic subscriber, and would give a visible indication to the receiving operator of the number required by each caller.

Apart from the requirements of the automatic system itself a need had been felt for a modification in the method of handling traffic between manual exchanges in cases where it was not economical to route that traffic direct from one exchange to another. With the necessary establishment at manual exchanges of the visible indicator equipment to which I have referred, it was possible to combine with the preparations for the introduction of full automatics, a scheme for the automatic switching, at a central point, of indirect manual traffic. The central switching point is known as the Tandem exchange. This exchange will be fresh in the minds of many of you; but it may be helpful to some if I run over its functions very briefly.

Under the old conditions the "A" operators had to remember a number of junction centres, arranged on a geographical basis, and select the proper centre for a given call. Under Tandem switching conditions the "A" operator passes all indirect calls to an operator at a key-sender "B" position in Tandem exchange. The Tandem operator allots a junction to the calling exchange and then taps out on a set of keys the first three letters of the name of the required exchange followed by the four digits of the required number. A junction to the objective exchange is found automatically, the Tandem apparatus transmits the particulars of the required number over that junction and the signals either set the switches direct, and cause the required subscriber to be rung, in the case of a call to an automatic exchange or, if the objective exchange is manual, cause the number to be displayed on a lamp indicator in front of the "B" operator at that exchange.

Fig. 1 shows the amount of traffic handled weekly through Tandem since it was brought into service.

Apart from various operating items to which I shall refer later, the correct transmission of any required number to the objective exchange after correct receipt at Tandem is dependent upon:—

(1) Accurate keying of the Tandem operator.

(2) Accurate transmission of this keying from the keys themselves to an automatic sender which controls the main switches of the Tandem exchange and transmits the required number over the junction appropriated for the call.

(3) The correct working of this sender.

(4) The accurate operation of the Tandem switches in response to the sender impulses.

(5) The accurate reception and transmission over the junction in certain cases by a further piece of apparatus known as a "Coder."

(6) The efficiency of the junction used.

(7) The efficiency of the receiving and display apparatus at the distant end.

(8) Accurate connexion by the manual operator at the objective exchange.

In order to secure the best service results various alterations have had to be made in the original circuit arrangements. These have reduced the measure of difficulty but there are still further problems to be tackled. Nevertheless the service improvement has been definite and the tendencies are healthy.

In order to determine the quality of service given, a system of observation at manual exchanges of traffic passed via Tandem has been instituted.

* Paper read before the London Telephone and Telegraph Society.

Fig. 2 shows the more recent results obtained on these observations. The percentage of O.K. calls is improving. With any system of automatic switching—particularly in the present stage of development—it is inevitable that some cases will occur where the call has passed to the plant but the plant fails to set up the required connexion and nothing is heard. In the case of traffic going through Tandem the operators at manual exchanges

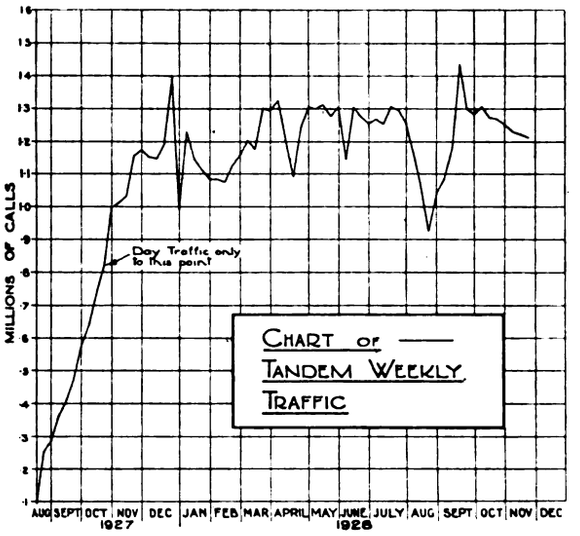

FIG. 1.

are able to supervise the traffic closely and if they do not get what is known as a Ringing Tone—which indicates that the required subscriber is being rung—after a reasonable interval, they are able to re-pass the call. This type of failure is rapidly diminishing.

The plant is so designed that if for any reason the whole of the seven impulses required for the proper transmission of a standard call are not

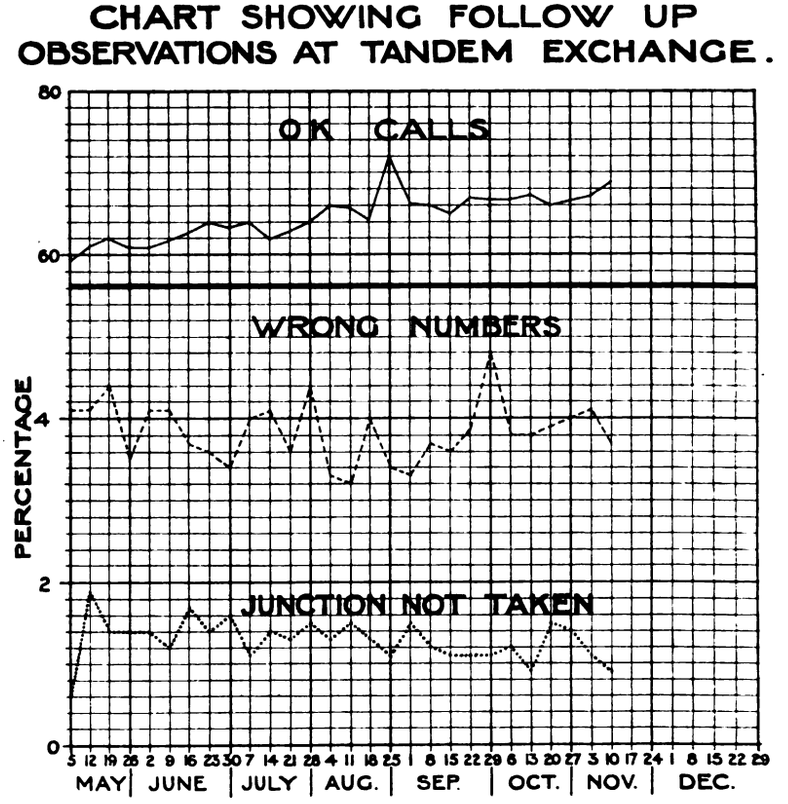

FIG. 2.

received by the transmitting plant, the call shall be diverted to a manual operator in the Tandem exchange. Fig. 3 shows the number of such cases occurring daily. These cases only represent a fraction of 1% of the total traffic handled, but they have been too numerous. It is hoped that in due course they will be almost if not entirely eliminated but it is satisfactory to notice how rapidly they have diminished in the last week or two.

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It will have been gathered from what I have said that for the setting up of a Tandem call a piece of apparatus known as a "Sender" is all-important. A sender is only switched in for a short time on each connexion. As soon as a sender has completed its allotted task it should be switched out automatically and restored to a common pool for use again on another call at the earliest possible moment. A certain amount of difficulty has been experienced in practice in securing the rapid return of senders to the common pool and at times the demand for senders has exceeded the availability. This feature assumed serious dimensions at times. Circuit modifications were introduced to ensure the more rapid release of senders and the trouble has been overcome.

I will now deal with the public automatic exchange system, and as a reminder to those in the audience who are not in day-to-day touch with automatic telephone questions I will run briefly through the outstanding features of automatic switching.

CHART SHOWING DAILY RECORD OF THROW OUTS AT TANDEM

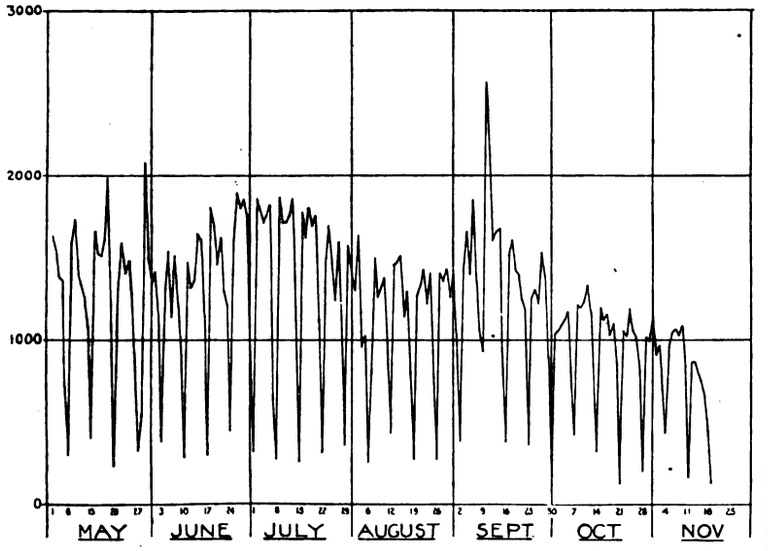

FIG. 3.

Each subscriber on an automatic exchange is provided with a dial for signalling purposes. The figures 1 to 9 and 0 appear on this dial together with the letters of the alphabet. The first three letters of the name of the exchange are shown in capitals in the Directory in the subscribers' entries relating to each exchange in the automatic area and to obtain connexion to any such subscriber the caller dials in succession these first three letters followed by the four digits of the required number. This process sends a train of impulses to the automatic exchange. These impulses reach a piece of apparatus known as a "Director." This director receives the impulses from the subscriber, translates those relating to the first three letters of the exchange name into a particular code which can be varied by the administration as required, and which directs the call through a train of switches to the exchange required. The director then sends out signals corresponding to the four digits of the required number; and through the switches the call is established automatically either direct to another automatic subscriber or through a Coder Call indicator position to a subscriber on a manual exchange.

If the subscriber desires help in the setting up of calls, or wishes to make an enquiry, he dials "O" and is connected automatically to a manual switchboard.

Traffic incoming to an automatic exchange from other automatic exchanges is received direct on numerical switches. The traffic from manual exchanges is handled as a general rule at key-sender "B" positions similar to those referred to in my description of the Tandem exchange.

The automatic exchanges at present in use in the London area are as follows:—

Exchange.	*Date of Opening.*	*Capacity in Lines.*	*No. of Working Lines at Nov. 17, 1928.*
Holborn ...	Nov. 12, 1927	9,400	6,064
Bishopsgate ...	Mar. 3, 1928	8,100	5,309
Sloane	July 28, 1928	8,400	4,979
Bermondsey ...	Sept. 1, 1928	2,700	1,492
Monument ... Mansion House	Nov. 3, 1928	9,400	802
Welbeck ...	Dec. 1, 1928	8,700	900
		46,700	19,546

With the opening of automatic exchanges we at once strike a difference in the statistical representation of the traffic handled. Fig. 4 shows graphically the traffic handled at the Holborn exchange prior to the automatic conversion and a projection of what the recorded traffic would have been in the ordinary course had the manual conditions continued. Each automatic exchange is provided with meters on the directors, and every time a director is released after seizure for a call the director meter operates. A director is only seized if a subscriber not only removes his receiver but also actuates his dial in some way. You will see that the director readings are very much in excess of the manual estimates. There are various causes contributing to this excess. In the early days of the Holborn exchange all routine tests were included in the director readings. In some cases there were minor defects on the Coder Call Indicator equipment at manual exchanges and calls were routed to some service point and had to be credited. If the caller seeks the assistance of an operator and she makes connexion for him a director is used for his call to the manual board and a further director is used by the operator to establish the call. Every extra attempt on the part of the operator will be recorded on the director and whereas under manual conditions the operator might make a number of attempts without involving any record on her registers, every attempt which the automatic subscriber makes himself on his own initiative will be recorded. It will be seen, therefore, that account has to be taken of these various factors in interpreting the director readings of an automatic exchange.

Fig. 5 shows the weekly director meter readings for each automatic exchange separately and for the automatic system as a whole. You will notice the increase in the running curve as each new automatic exchange is added. It will be seen that the amount of traffic per week is now well over 1 million calls.

We will now turn from traffic volume to the question of service efficiency. In considering the statistical representation of service results it is necessary to have constantly in one's mind the different conditions under which the calls are made in the manual and automatic systems. When we observe manual service results we follow an individual subscriber's experiences in obtaining a particular call. That call may not go through on the first attempt of the operator. She may have to change the junction to the objective exchange or take some other step to ensure the satisfactory completion of the call; and if in the end that call is completed for the caller the transaction is regarded as O.K. in the observation statistics. Under automatic conditions the caller has no operator to help him out in case of doubt or difficulty unless he calls specially for her. If a change of line is desirable the caller has to

HOLBORN EXCHANGE
WEEKLY REGISTER READINGS

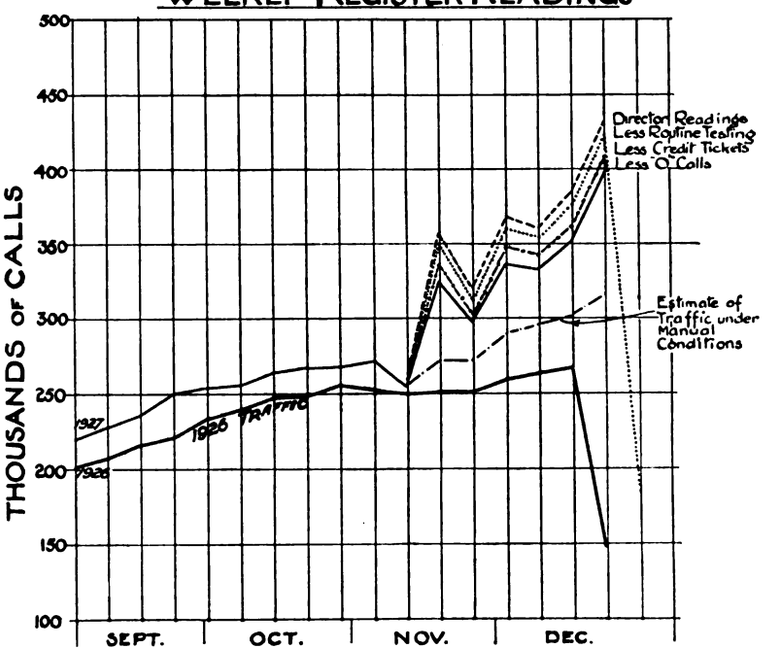

FIG. 4.

abandon his first connexion and dial again. The observation conditions do not provide for the following out of each call as an individual transaction. Each attempt is a call from the point of view of the observer of this new type of service. Under such conditions the proportion of O.K. calls is inevitably curtailed. The caller uses his own discretion in the amount of time he allows for the answer of his correspondent and there is no doubt that in many instances he gives up his attempt before he has allowed time for his correspondent's answer. It is necessary to bear these points in mind in considering the service items shown in Fig. 6. This shows for each

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of the automatic exchanges the percentage of calls accounted for, i.e., cases in which a subscriber has lifted his receiver, dialled, and has got some result; the percentage of O.K. attempts; and the percentage on which no reply is obtained and no ringing tone is heard by the caller. In the earlier stages of the development of the automatic exchanges the cases of "No Ringing Tone—No Reply" were sometimes on the high side, but as the apparatus

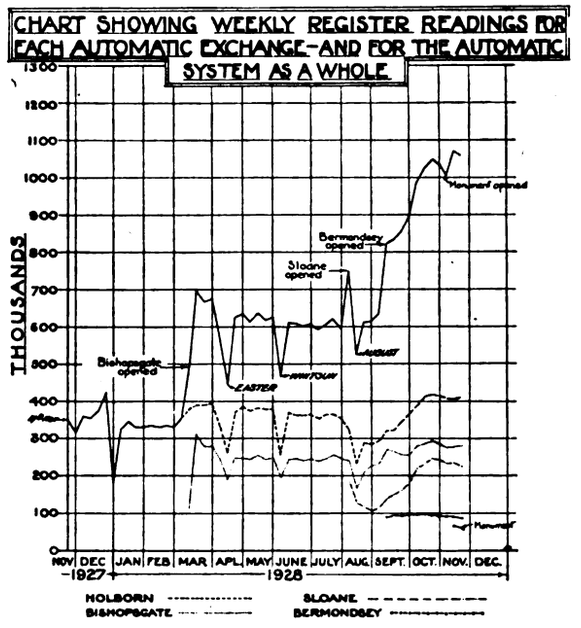

FIG. 5.

is tuned up in service the conditions improve, and they seem to be stabilising round about 5%. I think there is room for further improvement here and this will no doubt come with the further improvement of maintenance routines.

Fig. 7 shows incoming service results as observed at manual exchanges passing traffic to automatic exchanges. In the case of new exchanges the service results are tabulated daily for a time. It is interesting to note that

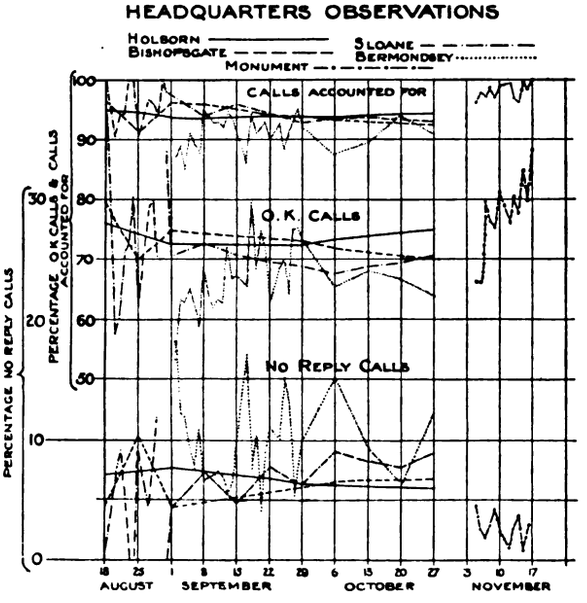

FIG. 6.

usually the service tunes up to the general standard after a week or two. It was, however, gratifying to find what a good start was made on Monument exchange. This sets a better standard for the other exchanges to attain.

It is interesting to see the time taken in the various stages of connexion in an automatic call, and this is shown in Fig. 8. It will be noted that in the case of the full automatic call the ringing tone is connected very promptly, and the time taken to obtain an answer from the called subscriber is comparatively short. In the case of calls from automatic to manual exchanges it will be appreciated that it is impossible to secure *immediate* answer of calls at the Coder Call Indicator positions at the manual exchanges. The manual handling inevitably introduces a potential source of delay; but it will be seen that the total time taken up to the answer of the subscriber is shorter under those conditions than under manual operating conditions.

The following statement shows a comparison between the observed calls from automatic subscribers to manual exchanges and from manual subscribers to manual exchanges. Bermondsey figures have been excluded, as owing to the effects of cable breakdowns they are not altogether representative. The proportion of abandoned calls bears out what I have already said about the repeated calls of the subscriber when he is forced back on his own resources :—

Item.	*Holborn.*	*Bishops-gate.*	*Sloane.*	*All Auto. Exchs.*	*Manual Exchs.*
1. Percentage of calls established on first observed attempt	75.2	70.5	69.3	72.1	83.2
2. Percentage of calls on which—					
(*a*) Busy Tone connected ...	9.6	9.8	9.9	9.8	11.6
(*b*) N.U. Tone connected ...	0.3	0.6	0.3	0.4	—
(*c*) Wrong number connected	1.6	2.1	3.9	2.3	3.6
(*d*) Subscriber makes dialling error	1.4	2.4	1.9	1.9	—
(*e*) No reply obtained, i.e., in the case of automatic exchanges, calls abandoned by subscriber after 60 secs. from commencement of ringing...	2.1	2.6	2.8	2.4	2.6
(*f*) Subscriber abandons call prematurely, i.e., within 60 secs. of connexion of ringing tone	2.4	2.7	2.7	2.6	0.4
(*g*) Subscriber abandoned attempt without ringing tone being heard ...	6.0	6.6	8.2	6.7	—
(*h*) Connexion not established for miscellaneous reasons, e.g., N.U. Tone connected during dialling or on calls to manual exchanges (sub. dialled correctly) ...	1.4	2.7	1.0	1.8	0.2

Below are similar figures for calls operated entirely automatically :—

Item.	*Holborn.*	*Bishops-gate.*	*Sloane.*	*All Auto. Exchs.*	*Manual Exchs.*
1. Percentage of calls established on first observed attempt	72.1	73.3	67.3	71.7	83.2
2. Percentage of calls on which—					
(*a*) Busy Tone connected ...	12.4	11.4	15.8	12.6	11.6
(*b*) N.U. Tone connected ...	1.9	3.5	1.8	2.6	—
(*c*) Wrong number connected	0.6	0.3	2.2	0.8	3.6
(*d*) Subscriber makes dialling error	0.8	1.7	0.4	1.1	—
(*e*) No reply obtained, i.e., in the case of automatic exchanges, calls abandoned by subscriber after 60 secs. from commencement of ringing...	1.7	3.0	3.7	2.7	2.6
(*f*) Subscriber abandons prematurely, i.e., within 60 secs. of commencement of ringing ...	3.6	3.0	1.8	3.0	0.4
(*g*) Subscriber abandons attempt without ringing tone being heard ...	6.7	3.6	6.3	5.2	—
(*h*) Connexion not established for miscellaneous reasons, e.g., N.U. Tone connected during dialling (subscriber dialled correctly) ...	0.2	0.2	0.7	0.3	0.2

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Extra attempts are required by reason of the connexion of the Number Unobtainable tone, dialling errors and other miscellaneous causes, representing an increase in these statistics of about 13.0%. It will seen that if this figure is applied as a reducing factor to the percentage of calls completed manually (item 1, last column) the figure would be about 72.0%, or roughly approximate to that obtained under automatic practice. The further education

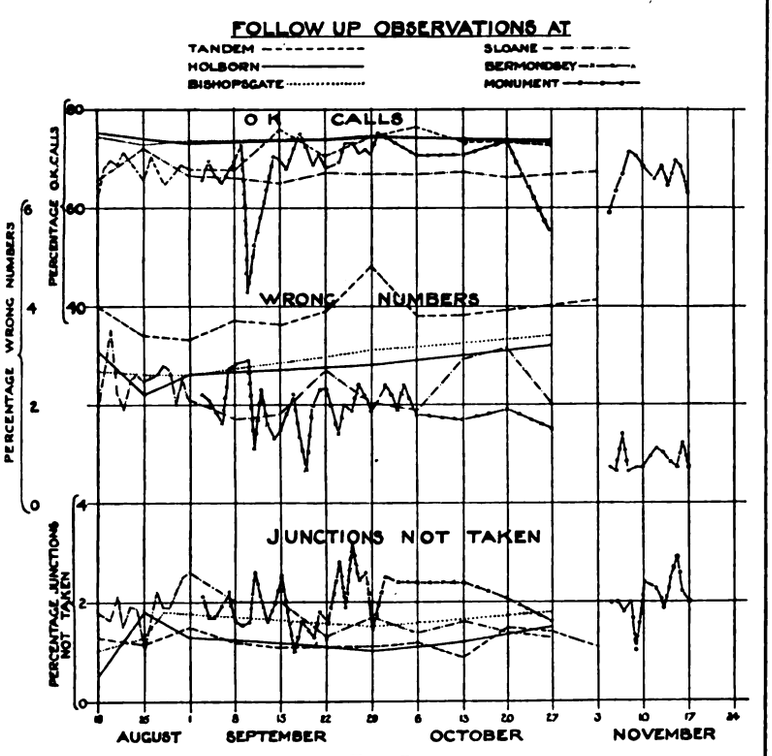

FIG. 7.

of the subscriber should tend to reduce dialling errors and other sources of waste effort. In this connexion let me quote from an article entitled "The Hand and the Dial," in *The Times* of Nov. 16 :—

> "I often start dialling before I lift the receiver. Midsummer madness, of course. Then my ear seems unable to discriminate between the many buzzings. A sign of a mis-spent youth. I should have been more assiduous and attentive in my visits to the apiary. Finally, I am overcome by the paralysis which attacks the typing neophyte. I can find S but not L—six but not one ; at least I *can* find them, but it all takes time. I am keeping somebody waiting ; who is it ? The operator ? No ; there is no operator unless I press O. The friend with whom I wish to communicate ? Certainly not, for I am not yet 'through,' but shall I ever be ? Something is happening now. What is it—the line engaged ? I must read the instructions once more, and in so doing I have lost the page with the number of my telephone. 'O ! for the touch of a dialling hand, and the sound of a voice that is still.' That's it, dial O, and when instead of the multiple buzzes I hear the voice of O, the relief is intense. Oh ! O ! !"

We must keep our eyes on the gentleman whose tendencies are to dial "O" instead of learning a comparatively simple lesson !

The training of subscribers and exchange staffs has been no light task. It would be quite impossible to provide subscribers who were to be connected to an automatic exchange with written instructions and to secure their efficient co-operation merely on the basis of those written instructions. It is essential that every potential user of the automatic system should receive a personal explanation of the use of the dial and a demonstration of the results of such use. In order to provide for this instruction a staff of nearly 40 men has had to be organised and trained.

For further details I would refer you to an article by Mr. J. Pettigrew in the June number of the *Telegraph and Telephone Journal*.

Various jokes have been made in the Press about the instructions given to subscribers. Some of you may remember the picture that appeared in one of the illustrated papers of an instructor discussing matters with a truculent subscriber, who ultimately exclaimed "Do you want me to do all this myself—do you take me for a performing pig ?"

The training of the exchange staff is also a matter of considerable magnitude and importance. It must be remembered that subscribers who are to be cut over to automatic service have to receive manual service right up to the time of their transfer. In the meantime the automatic exchange has to be tuned up, traffic tests have to be passed in considerable numbers and from the time of opening of the automatic exchange an operating staff has to be available which can deal intelligently with any enquiry or complaint made by any unaccustomed user of the dial service. For this purpose a considerable number of reliable operators have to be withdrawn from their manual operating duties and given a course of training for the new work. They have to learn how to make out tickets relating to various enquiries and complaints which will convey the most information to the Administration with the least expenditure of time on the part of the operating staff. Difficulties met with by dial service subscribers differ in many respects from those experienced by manual subscribers, and each potential operator has to be given a course of practical training in the handling of calls of the various types. This training cannot be given at the expense of the public and it is necessary to set up special circuits and to arrange for teachers to act the part of subscribers, pass calls of the various types to the students, and instruct them in the treatment of those calls. The instruction problem was a particularly difficult one in the case of the first exchange opened, because it was impossible to foresee exactly what the experience and the attitude of the public would be. After the first exchange had been opened we were able to give students, at the end of their training course, some experience of actual public work before they took up their duties at a new exchange.

Reverting to the training of subscribers, I should mention that in addition to the training given at the subscribers' premises we invite every subscriber to visit a working model automatic exchange installed in suitable premises near each new automatic exchange.

Apart from these special demonstrations for individual subscribers, we are endeavouring to widen the interest of the public by demonstrations at exhibitions, and a very considerable measure of success has attended public demonstrations given by our staff in connexion with such events as "The Business Efficiency Exhibition," "The Model Engineering Exhibition," and "The Exhibition of Patents." We recently gave demonstrations in the Soda Fountain Lounge of Messrs. Barker's at Kensington, which were attended by 1,475 people. The model is at present at Messrs. Ponting's Stores. It is also interesting to note that instructions in using the dial have been prepared in Braille by the National Institute for the Blind.

The staff have to deal with some queer comments—for example, that of the man who remarked "You say I must dial the first three letters of the exchange name ; but how do I get on when I wants ''OP' ?"

I have stressed the question of the education of the public because there is no doubt we are calling upon the public under automatic conditions to visualise what is happening to a much greater extent than is necessary for them when an operator is responsible for seeing a call through. Apart from the dialling itself, which frequently leads to misunderstandings, some of which

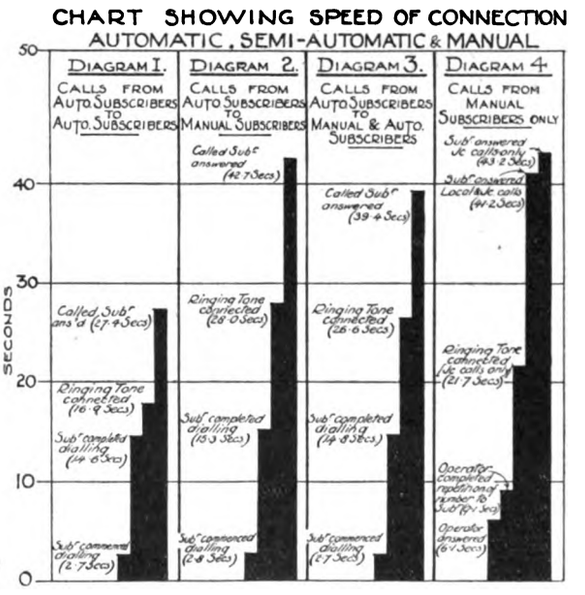

FIG. 8.

I will refer to later, the subscriber has to appreciate the full significance of tone signals. Most of you are quite familiar with the tone signals, but for convenience of reference I will recapitulate them briefly :—

Dialling Tone	... ...	A low continuous burring sound which must be heard by the subscriber after lifting his receiver before he commences to dial.
Ringing Tone	... ...	An intermittent low-pitched brrr-brrr——brrr-brrr——brrr-brrr heard by the caller while the called subscriber is being rung.
Busy Tone	... ...	An intermittent high-pitched buzz——buzz——buzz to indicate that the required subscriber or some intermediate channel is engaged.

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Number Unobtainable Tone A continuous high-pitched buzz which is connected if the caller dials the wrong exchange code, the number for some reason is out of service, or if for some other reason the connexion he requires cannot be made.

A lady was endeavouring to explain to a friend the correct method of using a dial telephone and after a very disjointed explanation she added: "For heaven's sake, my dear, do be careful and not put your finger in the wrong hole or you'll bring on a jazz band!"

Early in the year it was clear that subscribers were not understanding fully the ringing and busy tones. An examination was made of the percentages of calls abandoned by Holborn subscribers at varying intervals of time, when the ringing tone was connected and when no ringing tone was heard. These are shown in Fig. 9. The curves demonstrated the tendency on the part of subscribers to abandon calls prematurely and it was decided to issue special circulars on the subject of tones. Further publicity was also given in the Telephone Directory. Conditions have improved, and results of a more recent examination are shown in the corresponding combined curves for Holborn, Bishopsgate, and Sloane.

Fig. 10 shows the *speed* of connexion of the ringing tone after completion of dialling in the case of "full automatic" and "automatic to manual" calls. This emphasises the speed of the full automatic system. The chart also shows the percentage of calls answered at various times.

I am sure we must spare no effort adequately to explain to subscribers the meanings of the various tones and the indications of the stages reached in a dialled call. Apart from treatment of the single line subscribers, much could be achieved if we established a special visiting staff to inspect the operating work done at private branch exchanges and advise subscribers on the means to be adopted in order to secure the best service results.

It is really surprising what misconceptions arise in the minds of the people who have not been adequately instructed in the operation of the dial system. A good deal of light has been thrown on this aspect of automatics by the experiences with the public at pre-payment call offices fitted with dials in association with Bermondsey exchange. Some people have thought that in dialling the first three letters of the name of the required exchange they must send three letters on the dial simultaneously. One bright person was found to be attempting to insert fingers in 7 holes simultaneously—corresponding with the 3-letter code and the 4 digits of the required number—and then to

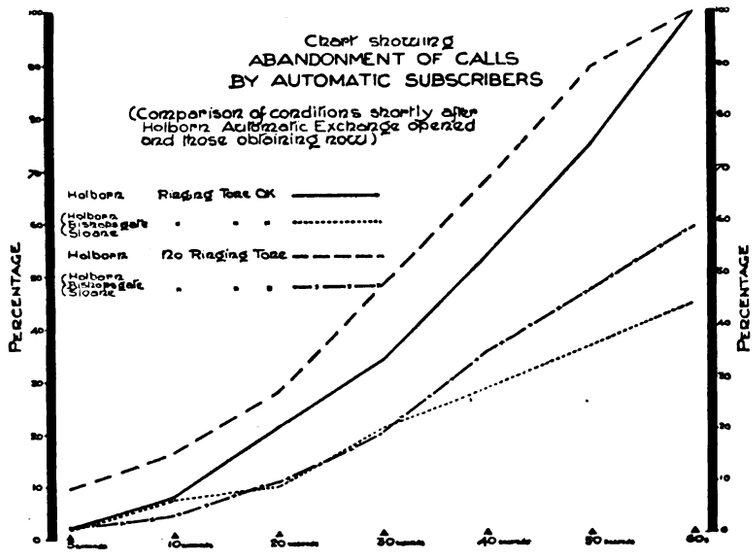

FIG. 9.

give the dial some sort of a twiddle in the fond hope that he would get through to his number. A selection from the very long list of erroneous practices is given below:—

Dialling without lifting receiver.
Dialling local number without exchange code.
Dialling code for Toll calls (e.g., DAR equivalent EAS).
Dialling from "O" to required letter.
Omitting to disconnect for "follow-on" call.
Dialling exchange name (particularly 4-letter exchanges) in full.
Prefixing all calls with "O."
Attempt to dial all digits simultaneously.
Misunderstanding codes.
Incorrect spelling "AVU," "HOB," "CLA," "WAL" (London Wall).
Dialling exchange name only, number spoken into transmitter!
Dialling without inserting the coins.
Button "A" or "B" pressed immediately after number has been dialled.
Dialling "AVE" (code appearing on instruction card) before all calls.
Button "A" depressed to obtain "O."

The area served by the Bishopsgate exchange comprises a large part of the Jewish quarter. A good deal of difficulty was experienced in the first instance in getting some of the more illiterate subscribers to use the dial. I am told on very good authority of one gentleman who badly wanted to get on to a Wimbledon number and failed every time. It was subsequently found that our Hebrew friend was repeatedly dialling VIM!

A good deal of trouble has been experienced owing to subscribers either imagining that they are supposed to dial more than the first three letters of an exchange name or doing so unconsciously. Such short names as EAST and PARK form a trap for the unwary; and it has been necessary to insert

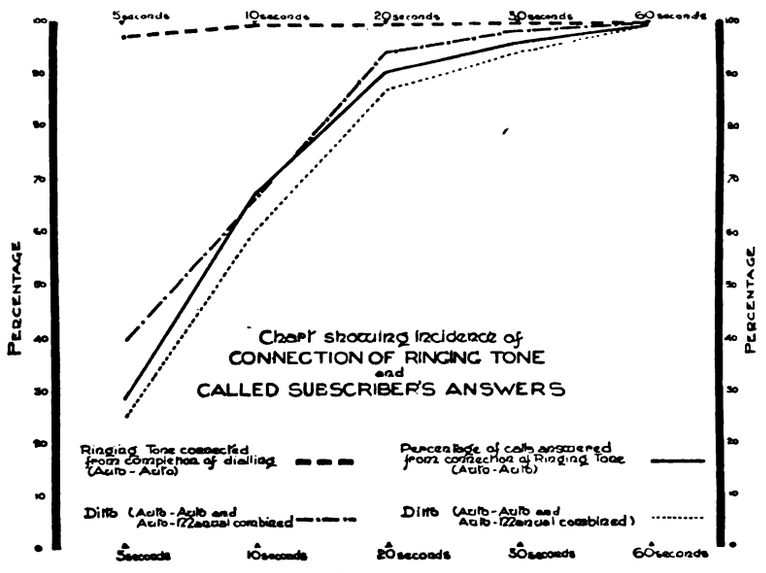

FIG. 10.

a special warning notice in the preface of the Telephone Directory. It will be appreciated that if the subscriber who wants East 1234 dials E'A S T in full followed by the number he will actually get through to East 8123, as the redundant letter "T" thus becomes, from the signalling point of view, the numeral 8.

I have nothing but praise for the interest which the operating staff have taken in this new and most important development in the art with which they are associated. They have not spared themselves in endeavouring to secure the most efficient results from the new system. The responsibility of an operator on outgoing positions is a particularly important one in helping with difficulties and securing the smooth working of the system. The manual board operators come to the assistance of the subscribers who have difficulty owing to "No reply" from the wanted subscriber or frequent receipt of the engaged signal. They also provide information in cases where the "Number unobtainable" tone has been connected, &c. Their experience often enables them immediately to diagnose the causes of troubles experienced by subscribers. A little judicious questioning may elicit such information as that the subscriber has dialled CLA for Clerkenwell or HOB for Holborn. One man explained to the exchange that he always got an operator, no matter what he dialled. In discussing the case the subscriber suggested that it would be an advantage if the finger stop were removed. It was then discovered that his practice was to move the dial round to the finger stop and then continue the rotation beyond the stop with the other hand, with the result that every signal he sent was converted into "O"!

The assistance operator carries out excellent work in training subscribers in the method of reporting difficulties. This statement shows the percentages of calls of various types handled by assistance operators on Holborn exchange, together with the operating values of the different types in units and the overall average operating value per call:—

Item.	%	*Factor.*	*Value in Units.*
1. O/G enquiries and assistance	31.1	10.0	311.00
2. I/C enquiries and complaints	19.5	6.0	117.00
3. Coin box—postpayment ...	25.0	4.5	112.50
4. Changed number interception	11.4	3.5	39.90
5. Trunk offering	1.7	6.0	10.20
6. N.U.T. Queries	2.3	7.0	16.10
7. Service P.B.X.	9.0	1.5	13.50
	Total		620.20
	Average Value ...		6.20

As a result of improvements in the subscribers' and operators' work the average operating time per enquiry and complaint call, which was 124 seconds in February last, had been reduced by May to 107 seconds and is now less than 90 seconds.

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The satisfactory connexion of incoming traffic is dependent upon the efficiency of the operators at keysender B positions. The work of the B operator is of a more routine character. The staff serving these positions have done excellent work. With the best will in the world, however, some errors will arise, and the following list shows some of the possibilities :—

"A" Operator.

Fails to pick up junction allotted.
Clears junction prematurely (RT. O.K.).
Passes demand for wrong number or exchange.
Holds original junction and passes fresh demand for number.
Breaks in on order wire; plugs in incorrect junction.

Keysender "B" Operator.

Fails to key up completely.
Keys up when no outlets available (all sender finder lamps glowing).
Keys up wrong number.
Depresses assignment key too quickly (thereby clipping number of junction allotted).
Does not wait for flicker on sender lamp after keying up a call.
Keys up despite failure to secure an outlet (i.e., failure to recognise an equipment fault).
Quotes incorrect junction number to "A" operator.
Omits to depress relative junction assignment key after allotting junction.

"B" Operator at C.C.I. Position.

Connects wrong number (display O.K.).
Connects an engaged line.

Faulty Articulation.

In the earlier stages the conditions were exceedingly trying, and in the consideration of the question of whether the human element or the plant is to blame for certain service failures the fact that the human element will inevitably be responsible for some measure of trouble has given rise in some instances to a tendency to attribute more blame to the human element than was justifiable.

(To be continued.)

THE LOST OFFICE CIRCULAR.

WE congratulate our colleagues of the "F" Division, C.T.O., on their Christmas card, which has this year been expanded into a circular of eight pages. In its general format the "Lost Office Circular" resembles its prototype; other features of resemblance are a List of Vacancies, notices to the staff on Single Day Absences and Special Leave, a list of Offices Open for Telegraph Business (which is short) and a list of Awards for Suggestions (which is even shorter). But, unlike the Post Office Circular, it may be read without the preliminary application of a paper knife; among other original features are a record of the net circulation figures (the Post Office Circular has alway been very modest about its circulation), a Free Insurance Scheme (a little vague in its scope), a collection of funny stories, answers to correspondents, copious illustrations and advertisements. The advertisements classified under the heading "Postal Bargain Corner," are perhaps the best feature of all. The Circular expresses that spirit of self-depreciation which is characteristic of the British race. During the war, when the Press extolled the gallant valour of the men in the trenches, those heroes themselves would describe themselves as "Fred Karno's army," or "a rag-time show," and would frequently thank Heaven for the existence of a Navy. We may suspect that such expressions were partly a safety-valve for the trials to the patience and the temper sustained in the course of a wearisome and arduous task, partly a "camouflage" for the pride that must never be expressed. Applying the same arguments here, we may infer that the "F" Division of the C.T.O. is very proud of itself—as indeed it has good reason to be.

The jokes are for the most part hardly suitable for reproduction; the full meaning of some of them can only be perceived by the initiated. But even for the uninitiated the Circular is far too good to miss, and we suggest that those of our colleagues who have not received a copy of the Circular should buy a copy for themselves; we understand that there are still a few copies left, obtainable from Mr. C. Young, "F" Division, C.T.O., at a cost of 1*s*., including postage. We understand that any surplus over expenses will be handed over to the Trustees of the Fund for relief of distress in the mining areas.

Though it is unfortunately too late to return the Christmas wishes of the "F" Division, we heartily wish to them and to the telegraph service in general a good and prosperous New Year.

TELEPHONE PIONEERS.

GATHERING OF EX-NATIONAL TELEPHONE MEN.

A TRULY remarkable gathering assembled at the Criterion Restaurant, London, on Monday, Dec. 10, when nearly 450 ex-members of the National Telephone Company's staff and their guests met at dinner. The idea originated with Lieut.-Col. C. B. Clay, and the necessary arrangements were carried out by a committee consisting of himself, Messrs. W. W. Cook, F. Gill, P. J. Ridd, W. A. Valentine, T. A. Prout (Secretary), and H. M. Darville (Treasurer). Their efforts were crowned with the utmost success, for despite the fact that 17 years had elapsed since the Company's existence ceased, they secured the attendance of all the chief officers (save one in Stamboul), the sole surviving director Lord Harris, and of existing and retired executive officers from all parts of the country. Besides those named in the Chairman's speech there were present Messrs. R. Shepherd, J. C. Chambers, G. F. Preston, A. Coleman, F. Cowley, W. A. Valentine, John Scott, T. A. Prout, and District Managers, Contract Managers, Engineers and others too numerous to mention separately, and a host of old friends who had not met one another for 17 years. Amongst the guests were Mr. W. T. Leech (Director of Telegraphs and Telephones), Mr. F. H. S. Grant (Assistant Secretary), Mr. L. T. Horne (late Assistant Secretary), Col. Purves (Engineer-in-Chief), Mr. Sinnott, Mr. de Lattre, Lieut.-Col. O'Meara and others of the Post Office staff, Mr. J. E. Kingsbury, long associated with the Western Electric Co., and Mr. H. Lawes-Webb.

Col. CLAY, who presided, proposed "Old Associates," and said that after the farewell dinner seventeen years ago he had not anticipated that he would be called upon to preside, at such a gathering. Unfortunately, as was inevitable, many of their old associates had passed away since they last met, but many veterans were with them still. There were Lord Harris, their old director, Mr. Goddard, their General Superintendent, Mr. Anns who was the Secretary, Mr. Sinclair and Mr. F. Gill, successively Engineers-in-Chief, and Mr. Cook. Then they had two of the oldest pioneers present. One was Mr. C. J. Phillips who joined the service on Sept. 9, 1879, and whom he believed was the oldest telephone man in the country. Near him was Mr. J. S. Holt, who joined the old Lancashire and Cheshire Co. in November, 1879, and who was now 85 years of age. During the war he worked regularly in the Bournemouth Post Office as a telegraphist. Now they had got together he suggested they should stick together and should see if they could not form a Telephone Pioneers Society. The people doing the work to-day were preparing the way for a larger telephone service than they perhaps dreamt of. Many years ago he attended a meeting at which it was calculated that 10,000 telephones were the maximum that could be looked for in London, but to-day they had in London 600,000 telephones.

Lord HARRIS, responding, said that he was the last surviving director of the old National Company, and he was less capable than any of his old comrades to speak on the history of the company, as he came in comparatively late, and his activities were rather in the direction of overcoming political obstruction than in pushing the activities of the telephone itself. The public was not now as critical of the telephone as it was in the company's time. During the whole life of the company it had not a friend outside the board, the staff and the executive officers. He used to accompany his friend, Mr. James Staats Forbes to interview various politicians, and with very little success. Much of the opposition to the service at that time was most absurd, and if it had not been for the audacity of the late Mr. W. E. L. Gaine and Mr. Goddard, the company would not have been in as good a position as it occupied at the time its licence expired.

Mr. STANLEY J. GODDARD said he was now a telegraph man, but now that telegraphy and telephony could be carried on simultaneously on the same cables, it was possible that telegraph and telephone men might come closer together. The National

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staff were a happy lot in the old days, and they had no reason to be ashamed of themselves. They all worked to produce a service which he thought was going to stay.

Mr. W. A. VALENTINE said he had been asked to reply for those who were still in the "firing line." Speaking of the progress that had been made, he said London, Sweden, Spain, and Germany could be connected over the transatlantic wireless with New York, San Francisco or Vancouver, and they looked forward to the time, not so very far distant, when they would converse with India and Australia.

Col. T. F. PURVES, Engineer-in-Chief of the General Post Office, said before the transfer of the company's undertaking they of the Post Office had made many friends in the ranks of the National Company, whose knowledge and longer experience they recognised. He thought it was now admitted that the men who did the great and delicate work of grafting the two staffs together did it with a measure of success which deserved the highest commendation. He did not think the transfer of the undertaking to the Post Office made the Press or public less inclined to criticise it.

Mr. FRANK GILL, who received quite an ovation, proposed the toast of "The Chairman," and remarked that perhaps the scope of the telephone service was not always realised. If there were a telephone in that room one could ring up 26 million telephones. He also suggested that a big telephone push in this country would do a great deal to reduce unemployment, and confer a general public benefit.

The CHAIRMAN, in acknowledging the toast, said thanks were due to Mr. T. A. Prout, Secretary, and Mr. H. M. Darville, hon. treasurer, for the work they had done.

The musical programme was much curtailed in order to give all present an opportunity of mingling and renewing acquaintance with old friends. Time, therefore, admitted of no encores to those excellent artists Miss Phyllis Pidgeon, Mr. John Whiffen, and Mr. Arthur M. Hemsley. A topical song, "Telephone Pioneers," written by Mr. W. H. Gunston, to the familiar air of the "Vicar of Bray," aroused considerable enthusiasm. Mr. Hemsley sang it admirably, his fine method making every point in the lines tell. In response to several requests, we give it in full:—

When PREECE the telephone first brought
  Across the Atlantic ocean
A scientific Toy 'twas thought—
  A sort of "Yankee notion."
But men of faith and foresight laid
  A Company's foundation
Which earned despite full many a slight
  The goodwill of the Nation.

Chorus:
  Then let's acclaim the Company's name
    Which this great work began, Sir,—
  Those pioneers deserve the cheers
    Of every telephone man, Sir.

So well did our new Toy succeed
  That soon—you needn't laugh, Sir,—
By legal lights it was decreed
  To be a "telegraph," Sir.
But, whether telegraph or 'phone,
  It triumphed in all quarters
And the good ship manned by FORBES and BRAND
  Rode o'er the troubled waters.

When Blackburn's loss became our GAINE
  Our progress was unceasing,
And all throughout his able reign
  The system kept increasing.
The London service day by day
  Like a colossus spread, Sir,
An idol not with feet of CLAY
  For CLAY was at its head, Sir.

The names of SINCLAIR, GODDARD, ANNS,
  Of PRESTON, GILL and CHAMBERS,
Of WATSON and CLAXTON, COLEMAN, COOK
  Who is there but remembers?
Where are they now, that famous band?
  Some rest from their long labours,
But most of them among us stand
  And are right welcome neighbours.

To name our scattered clan's new rôles
  Is more than time enables,
PHILLIPS plants fruit instead of poles
  And GODDARD governs cables.
And GILL's activities, fame says,
  The universe embrace, Sir,
And WATSON changes kilt for fez
  (Not worn in the same place, Sir).

They say that SHEPHERD moves about
  Mid odalisques adoring
By Marmora's shores; while busy PROUT
  Spends half his time plus-fouring.
JOHN SCOTT is making safety glass,
  No motor smash can break it!
'Twill ne'er be used for Port or Bass
  Or John Scott would not make it.

All Hail, survivors of our line
  Who still the standard carry!
May London have its VALENTINE
  For many a February.
Hail to our last Director, hail!
  Nestor of English cricket—
Lord HARRIS, never known to fail
  At council-board or wicket.

REVIEWS.

"Heaviside's Electrical Circuit Theory." By Louis Cohen. (Published by the McGraw-Hill Publishing Co., Ltd.) ix + 169 pp. Price 12s. 6d. net.

Among the classical books bearing on electrical communication, Oliver Heaviside's monumental treatise on Electro-magnetic Theory takes high rank. Unfortunately, however, the mathematical methods which he used are not familiar to the generality of telegraph engineers, and consequently his work has remained, to many who would otherwise have made good use of it, a closed book.

In the present volume an attempt has been made to clear away the obstacles just mentioned, as far as the theory of the electrical circuit is concerned, and this attempt has been very successful. The subject matter is presented in so clear and simple a manner that many of the difficulties which are felt with the original treatise have disappeared.

In the first chapter the operational calculus is described, and applied to the solution of the familiar fundamental problems of the alternating current circuit.

The second chapter deals with the Expansion Theorem, by means of which problems concerned with the current and voltage distribution in all kinds of circuits, under steady or transient conditions, can be solved. This theorem is of very great importance, as by its means problems can be dealt with which could not be solved at all by the usual methods.

The third chapter deals with electric filter circuits, the fourth with ocean cables, and the fifth with transmission lines.

The sixth chapter deals with the theory of artificial lines, and in the next is given Heaviside's derivation of the Expansion Formula, as an alternative to the easier method of deriving this formula which is given in the second chapter.

In an appendix is given a note on Bessel functions, a collection of various mathematical formulae, and tables of Bessel functions and of experimental and hyperbolic functions.

The book is excellently printed, and we can thoroughly recommend it to all who desire to obtain a thorough grasp of the fundamental principles on which electrical communication is based.

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GLASGOW TELEPHONE NOTES.

ABOUT 130 people, including telephone staff and friends, desire to thank Miss Isaacs and her band of willing helpers from the Western Exchange for a very pleasant evening spent on Dec. 5 on the occasion of their annual Whist Drive held in Colquhoun's, Dowanhill House. Mr. Coombs, the District Manager, put in an appearance to lend his support to the social activities of the staff, but owing to a prior engagement, he was unable to be present the whole evening. Mrs. Coombs presented the prizes to the winners.

It is gratifying to note that the interest in that very deserving fund, the Civil Service Life Boat Fund, is being maintained by the Glasgow telephone staff. The amount contributed during 1928 was £17 6*s*., an increase of £2 17*s*. 6*d*. over 1927.

Calendars.

It is the "umpteenth" of January. If there is one fact in the world of which I am certain it is the date—not that it is the anniversary of my birthday, nor that of any of my friends, nor is it a special holiday or feast day—but I *know* that it is the "umpteenth" of January. Thirteen calendars adorning the walls of my bedroom, dining-room and study all collaborate to keep me cognizant of the fact! I often wonder if others suffer from this yearly—New Yearly—epidemic. Sometime in an unguarded moment, I must have said (when my friends gathered together in one place) that I liked calendars and found them useful! Each Christmas brings me calendars numerous and varied. The friends who know me in humorous vein send me funny little people by Mabel Lucie Attwell; those who find me serious send me "Great Thoughts" and "A Thought for every day in the Year"; others who have suffered at my hands send me "Household Hints" and the artistic friends know I appreciate beautiful forms and scenes.

Each year I am as worried as the Hanging Committee of the Royal Academy, as to where I shall hang my pictures, and in my despair I vow I shall scrap the lot at the end of January, but when the day comes "to do this thing" I find I am so attached to all of them that I cannot part with any. What am I to do? I continue to be told the date every way I turn, yet when I sit down to write a letter, I find myself saying "What's the date again?" The frailty of my memory makes me consider whether it would be wise "to pelmanise or not to pelmanise."

I have a premonition that should my friends read this they will all think I do not appreciate their gifts (and let me hasten to say I most surely do) and they will decide not to give me a calendar next year. What shall I do in that case for "a date"? On the other hand, each one may think that all the others will send me something else next year, and he or she only will send me a calendar as usual—in which case they will all send me a calendar! and the best of all is *that I really hope they will!!*

M. L. TULLOCH.

GLOUCESTER NOTES.

A PAPER on "The Hereford New Automatic Telephone System from a Traffic Point of View" was read by Mr. R. S. Grosvenor, Traffic Superintendent, Gloucester, before the Hereford Chamber of Commerce on Nov. 5, 1928.

A demonstration set was utilised to illustrate the outstanding features of the system and, in addition, each member of the audience was supplied with a simple diagram showing the system of switching. Special emphasis was laid on the question of the comparatively low calling rate at Hereford. The paper was well received and a discussion followed, questions relating to the paper and the Hereford telephone service generally being raised and fully answered.

When Miss A. H. Young, Travelling Supervisor, transferred from the Gloucester Telephone District to the South Wales District in September last, she was presented with an oak bureau, subscribed for by all the members of the staff of the Gloucester District, Traffic Section, and the exchanges in the Western Section.

Miss Young was universally popular and combined an engaging personality with a high degree of efficiency.

Expressions of sincere regret at her departure, coupled with best wishes for her future, were voiced by all who bade her farewell. Miss Young, in returning thanks, referred to the assistance and *cameraderie* which had made her comparatively short acquaintance with the Gloucester District a very happy experience.

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NEED THESE UP-TO-DATE BOOKS.

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168 pp., **6/-** net.

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THE DIRECTOR SYSTEM OF AUTOMATIC TELEPHONY
By W. E. HUDSON, B.Sc., Hons. (Lond.), Wh.Sc., A.C.G.I., Engineer-in-Chief's Dept., G.P.O., London.
Gives the principles of "step-by-step" selection in ordinary automatic exchanges, shows how these principles are amplified to meet the needs of large multi-exchange areas, and describes the special facilities required for dealing with the automatic-manual and manual-automatic traffic during transition periods. 160 pp. **5/-** net.

THE CALL INDICATOR SYSTEM IN AUTOMATIC TELEPHONY
By A. G. FREESTONE of the Automatic Training School, G.P.O., London.
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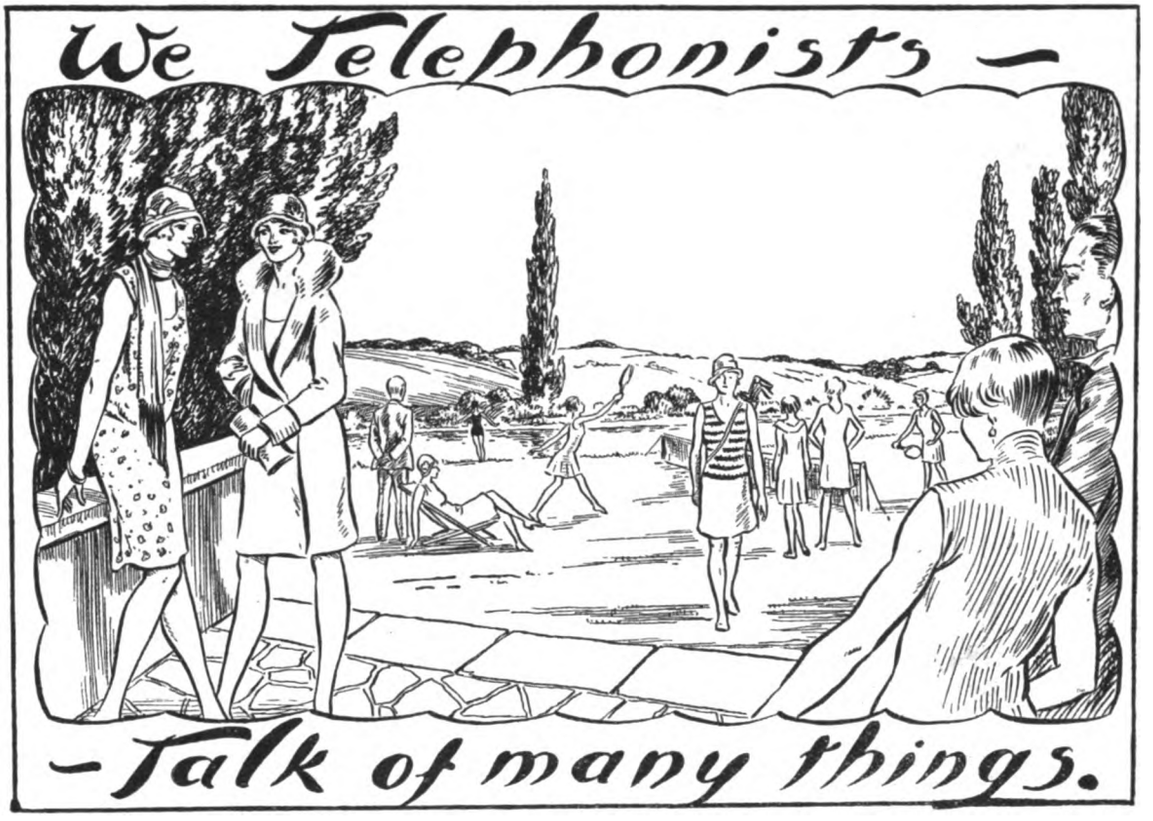

Murder and Mutts.

BOOM ! That means that another tree has fallen and that they have blown up the roots. There is a "development" scheme going on and a lovely wood is being cleared. Tree after tree has been felled and no one seems to care. All I can do is to sit by sadly and write a perfectly useless epitaph. The wind has played a requiem and has sobbed itself into silence ; the rain has streamed in sympathy and the pools are its tears ; the snow has laid its soft mantle as if to hide the gaping wounds. The trees have been outraged and murdered.

Trees are friends and these were mine. I have wandered amongst them. They have brought joy and hope in Spring, they have sheltered with their generous shade in Summer, their rich glow has warmed my heart in Autumn and in Winter their bare branches have pointed me outwards and upwards. I have stood beneath the larches as they swayed in the wind and I have fancied that the earth was a ship swinging gently on the sea and that the fleecy clouds were chasing billows. I have walked reverently along aisles of beeches whilst the soft light played through the leaves. I have stolen shy glances at the dainty birch as she shook her silken robes around her and I have worshipped the majesty of the oak and the cedar.

Now they are prone and dismembered, torn asunder, stripped—yet, even so, noble in death. Some few are left like captives to grace the gardens of the men who shall come after—and they bear the mockery in silence. Boom ! Another has gone. Oh, Damn !

Soon there will be pavements instead of a carpet of green and gold, the sweet breath of the brown earth will be stifled because of the bricks piled upon her bosom, and the wild riot of form and colour will give place to straight lines and correct crescents. Then the men will say, "See, we have developed our estate : let us make it even more beautiful. Let us plant little plane trees along our streets—one tree every few yards at a pace in from the kerb—and let us protect them with a stout stake and a cage of wire mesh. Let us alternate them with graceful lamp-posts of iron." And they will rub their hands and say, "It is good."

So will they plant trees amongst houses instead of houses amongst trees. Aren't men mutts !

PERCY FLAGE.

A Happy New Year.

Greetings to readers far and near. We wish you all a glad New Year. May 1929 display its treasures each successive day—good health, much wealth, and many friends ; may fickle fortune make amends for past reverses, and, in lieu, may joy and gladness come to you. And those who've added to our page a glamour—namely, Percy Flage (or Flahge !) and "G.M.T." and those who've written us in verse or prose, we thank with gratitude profound, and o'er and o'er their praise resound.

Oh, may the Provinces repent the very meagre copy sent, and may exchanges everywhere contribute each a monthly share, and make our column, wide and far, welcome as other columns are. Good luck, good fortune, all success are wished you by the Editress.

My Dreams.

I dream of the day I met you—
I dream of the light divine
That shone thro' your milk-white opal
When first I took your line.
I dream of the number you gave me
In tones like a soft caress,
And how you politely thanked me
When advised it was T.O.S.

I dream of the words you whispered
When I answered your calls each day—
And how I at times responded
When the Super. was far away.
You never were cross or impatient
No matter how sorely tried,
But calmly endured wrong numbers
And when "cut off" merely sighed !

Alas ! alas ! I have lost my Sub.
In the automatic fray—
And only a few poor fishes remain
On my board to-day !
But I dream of your voice and courtesy rare
And though your new dial I hate—
I shall love you the same for ever
As long as I serve the State !

C. A. S.

Contributions to this column should be addressed : THE EDITRESS, "Talk of many Things," *Telegraph and Telephone Journal*, Secretary's Office, G.P.O. (North), London, E.C.1.

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THE

Telegraph and Telephone Journal.

VOL. XV. FEBRUARY, 1929. No. 167.

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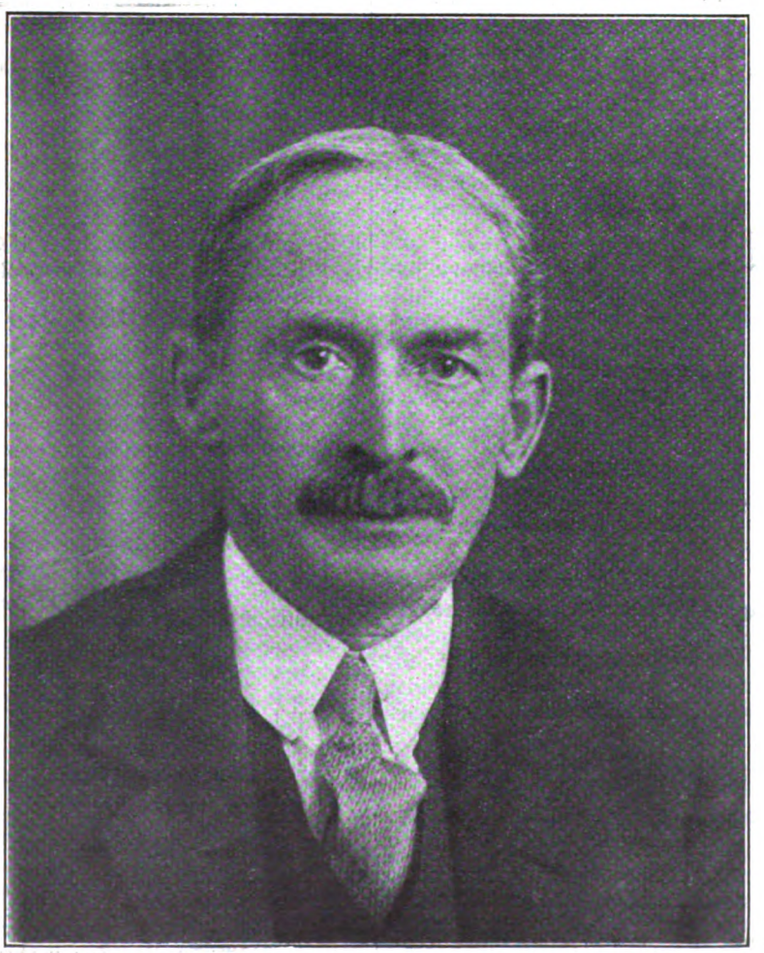
All correspondence relating to advertisements should be addressed to MESSRS. SELLS, LTD., 168, *Fleet Street, London, E.C.*4.

TELEGRAPH AND TELEPHONE MEN AND WOMEN.

LXI.—MR. D. M. FORD.



MR. DAVID MILNE FORD, the Deputy Controller of the Central Telegraph Office, commenced his career as a Telegraphist in 1885. In June, 1897, he gained by competition a Third-Class Clerkship in the Controller's Office, C.T.O., was promoted to the Second Class in 1904, to the First Class in 1914 and to a Principal Clerkship in 1918.

Mr. Ford's capacity for work was early recognised and his ability and thoroughness always manifested themselves in everything he undertook. On his transfer to the Instrument Galleries in 1919 as Chief Superintendent, his previous experience and his administrative training stood him in good stead. He quickly showed that he possessed not only higher supervising ability but administrative ability of a high standard, and he was promoted to Assistant Controller in 1922. Continuing in this capacity until 1927, being in charge of the Provincial Gallery for the greater part of the time, he succeeded Mr. Stuart Jones as Deputy Controller in June of that year.

A keen telegraph man from the time he entered the service, when the Morse system was the mainstay of telegraphs, he has seen that system largely replaced by machine telegraphs and has done much to encourage and develop the change. Possessed of admirable foresight, an efficient mind and tact in dealing with staff problems, he has all the qualities of a good administrator, and the C.T.O. is fortunate in having him as Deputy Controller.

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HOW TO IMPROVE THE TELEGRAPH SERVICE.

I.—BY A TELEGRAPHIST IN THE CENTRAL TELEGRAPH OFFICE.

(NOTE.—*The Editing Committee accept no responsibility for the views expressed in this series of articles.*)

THE extension of the Telephone Service, and the big commercial, social and economic changes that have taken place since the war, have each played a part in the decline of inland telegraph traffic. They are sufficiently serious to call for radical changes in the organisation of the service. To deal adequately with such a complex problem within the limits of space laid down is impossible, and this fact forms the writer's *apologia* for the sweeping statements that must inevitably appear.

ADMINISTRATION.

To the practical telegraphist the organisation appears to be top-heavy, and the system lacks adaptability. Whilst, in a complex business such as the Post Office, it is impossible entirely to separate the administration of the various sections, overlapping and confusion undoubtedly exist. There is room for greater simplicity and a much more scientific distribution of functions. It is of the highest importance that there should be more freedom for development.

The commercial side of our craft receives scant consideration under existing arrangements. Public facilities have been decreased. The application of staffing standards too high for existing circumstances, has led to conditions that frequently entail undue delay. Unstable apparatus has been brought into commercial use without having been tested under practical working conditions—without adequate alternative arrangements in case of breakdown—and sometimes without necessary technical information being supplied to the commercial staff responsible for its adjustment. It cannot be argued that "changes" such as these increase the confidence of the public, or attract traffic. On the contrary, their effect has been thoroughly bad, and has undoubtedly accelerated the decline in traffic.

The reorganisation of the Service, as a comprehensive and a more autonomous unit under a Director of Telegraphs, possessing reasonable latitude regarding future developments, would remove many difficulties that now exist. It should be his duty to direct the Telegraph Service along modern scientific lines. With adequate publicity and canvassing staffs existing services could be popularised, extended and improved as occasion demanded, and every possible effort made to attract traffic. In short, the idea is the creation of a centralised organisation, more on the lines of a modern commercial undertaking, to direct and administer the Service, with the Traffic, Engineering and other Sections, acting in an advisory capacity only.

Information concerning Post Office accounts is scanty, but there is undoubtedly need for greater freedom of action with regard to financial matters. Whilst there may be arguments in favour of a form of Treasury control, there are many reasons why the Postmaster-General should be invested with greater authority in financial matters, since it would simplify machinery with correspondingly beneficial results.

TECHNICAL.

Considerable difficulty, mutilation and delay have been caused by the manner in which new types of apparatus have been brought into use. It is suggested that no innovations should be introduced on traffic channels until exhaustive tests have been made under actual working conditions by expert operators in the experimental rooms, and that existing channels should be maintained until the innovation has been proved thoroughly reliable, following its introduction into the gallery.

The most important aspect of all telegraph systems is manipulative efficiency, and it follows that ease and efficiency from the operating viewpoint, should be the foremost consideration in deciding upon the introduction of new types. The importance of equal touch on type-keyboards may be quoted as an example. Of all the dozens of Booth-Wilmot keyboards in use, it will be difficult to find two possessing similar characteristics. Some are stiff, others light. Some have a big drop, others a small drop. Some have a springy touch, whilst others are "dead."

From the operators standpoint the results are very unsatisfactory, as there is, of necessity, frequent change of keyboard. If this defect cannot be remedied, a more efficient type should be sought, since the output of the whole operating staff is affected.

Few problems, if any, are more difficult than that of staffing. In such a complicated business as the Telegraphs success must depend ultimately upon the enthusiasm and co-operation of the staff. Many of the most enlightened and successful employers have devoted considerable thought to the question of encouraging the development of these desirable qualities and have introduced co-partnership, bonus and other schemes with that end in view. In the case of our own craft, there has been failure to apply psychology to staffing problems. No body of men and women, whatever their rank, can apply enthusiasm to their work when confronted by a gloomy prospect of worsening working conditions —worsening holidays—worsening duties—loss of old-standing privileges—with practically no prospect of promotion, or hope of escape, to more congenial duties. The problem has already become acute, and will become more serious in the future. Modern telegraph systems call for the expenditure of more nervous energy since the whole machine moves at greater speed than in the past, thus increasing the strain. It follows, therefore, that maximum operating efficiency cannot be maintained indefinitely.

If the organisation is to attain maximum operating efficiency it will be necessary to ensure frequent movement from the top, so as to maintain the most suitable age for manipulative work. There would appear to be but one satisfactory method of achieving this, and that is to staff the clerical and administrative posts from the manipulative grades. This may sound revolutionary in some ears, but like Lord Darling's comment upon his judgment in a famous case, "the more it is considered the wiser will it seem." Some may hold that these posts are already staffed in the main by officers from the manipulative grades. There is a very big difference, however, in the scheme here suggested. At present when ambitious young people enter the service considerable time and expense are involved in training them as telegraphists. A large proportion of this outlay is wasted, since they have to pass into the clerical class just about the time they have arrived at maximum efficiency and usefulness as an operator. This would be avoided in the scheme now being advocated.

Briefly, the plan is that selection for the Telegraph Service should be a little more stringent, both as to educational ability and as to suitability for modern telegraph requirements—a point that has never received the consideration it deserves. After a period as an operator, during which time much knowledge useful in the next stage would be acquired, the officer could be promoted, say, between the ages 30 to 35, as might be possible, to a clerical post. It is not claimed that every individual is suitable for, nor would desire clerical duties, any more than it can be claimed that every person now performing those duties is happily placed. The service does contain, however, many men and women of organising and administrative ability and technical skill, who simply lack the opportunity to utilise those abilities to the mutual profit of the Department and the individual. Obviously there would have to be some method of selection, but this is by no means an insurmountable barrier. Those officers failing to qualify could be employed upon duties where telegraphic knowledge and experience are called for rather than maximum operating skill.

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If a scheme on these lines were put into operation the Telegraph Service would become more of a career. Every individual entering it would feel that effort was worth while. There would be incentive all along the line, and enthusiasm would replace the blank wall that now lies across the path of those desiring to render of their best.

OPERATING.

It must be frankly admitted that specialisation does make the performance of a particular task easier. There are, however, other considerations to be borne in mind, i.e., the physical effects of monotony, mental fatigue, sense of irritation, &c., since the sending or reception of a public telegram is very different from making match boxes. A mobile staff is economic and desirable, and complete specialisation is not considered economic. Under a scheme such as that outlined in the previous paragraph a limited form of specialisation would be possible and would yield good results. The operator would know that he was not doomed to operate a Booth-Wilmot or teleprinter keyboard for the remainder of his official life, whilst there would not be the same need to conserve nervous energy, due to fear of breakdown, knowing that at the end of the operating period reward would be forthcoming by transfer to more congenial duties.

Subsequent difficulties would be avoided if more care was taken in the training of operators on the newer types of apparatus. Shortage of staff frequently leads to the suspension of practice, which is therefore not continuous, and as a consequence it is more difficult to acquire a good style. It is not uncommon for an operator after qualification of a type keyboard to be employed continuously in a division where keyboards are not used, with the result that no further experience is possible for a long period. When the individual is called upon to operate a keyboard, bad habits, such as looking at the keys, are acquired when working at speed.

It is a matter of general experience that a ten-hour duty is too long and it is impossible to maintain efficiency over a stretch of duty of that length without undue strain. Some improvement could be effected by the introduction of a definite break in each period of the attendance such as that in operation in the U.S.A.

NEW SERVICES.

The watchwords of the Telegraph Service must always be "Speed with accuracy," for without them prosperity will never come. There has recently been a tendency to get away from this interpretation of the function of our craft, and in its place to maintain an even flow of traffic, even if it entails delay. The cessation of this system is advocated and a return to the old slogan as a basis for the telegraph system.

There is undoubtedly a field for a variation of rates while maintaining the need for urgency in dealing with the ordinary telegram, as a basic principle. There are many occasions when the "Rush" telegram, on similar lines to the foreign "Urgent" telegram, would be a real benefit to the public, and the institution of such a service at double rates is suggested. This type of message should normally be delivered at any big town in the country within a few minutes of being handed in. The ordinary telegram, it is suggested, should maintain its present position at existing rates. In addition to these two types, there is need for a "Deferred" telegram at half the present charges, subject to, say, 6 hours' delay, to meet the need for less urgent business and social messages.

In addition, it is thought that there is an altogether new field for the "Advertisement," or circular telegram, which could be handed in one or more days before delivery was required, and charged for at very cheap rates—say, 50 words for 1*s.* and 2*d.* for each additional copy in the same town. This should be popular for certain types of advertiser and would bring in traffic to be sent during slack periods.

"Greetings" types of telegram have been advocated before, and there is undoubtedly a field for these at cheap rates.

The success of all these new services, and indeed the resuscitation of the Service as a whole, depends upon adequate and continued use of a keen, well-organised publicity section, who in addition to making known these and other services that might be inaugurated, would seek to educate the public in the use of the telegraphs. Canvassers should be employed—advertisements used—even talks on the wireless. Any and every legitimate means of attracting traffic should be explored. And having achieved that end—or better still, start now, *don't post telegrams.*

A last suggestion is that all telegraph offices should remain open for a period—say one hour—after the closing time for acceptance, in order to ensure that every message would be delivered the same day. It is pointed out that the railways will not issue a ticket to a passenger unless there is a train to convey him to his destination.

To sum up, the view of the telegraphist is that the Telegraph Service should be organised as a complete unit in which he or she could feel that they had a definite place and interest. It should be a service in which there was room for enthusiasm, and the team spirit. A place where there were no blank walls, but the definite encouragement of initiative and reasonable prospects of advancement to all who showed ability. From the public point of view there is a real need for an altogether different outlook in regard to the organisation and development of the service in order that the social and business needs of the community may be met.

[The next article in the series, by an S.C. & T. from a Provincial Office, will appear in our March number.]

REVIEWS.

"*Definitions and Formulæ for Students*": (1) "*Applied Mechanics*" (*by E. H. Levitt*); (2) "*Practical Mathematics*" (*by Louis Toft*); (3) "*Heat Engines*" (*by Arnold Rimmer*); (4) "*Electrical*" (*by Philip Kemp*). (*Published by Sir Isaac Pitman & Sons, Ltd. Each, price* 6*d.*)

These little pamphlets, of convenient pocket size (5½ in. by 4¼ in.), contain a collection of the most useful definitions and formulæ which occur in electrical work, heat engine work, applied mechanics and practical mathematics. The subject matter is well arranged and the printing and diagrams are very clear.

We can strongly recommend them to all those who need the information which they contain in a convenient and portable form. Students will find them especially useful as outline syllabuses of the various subjects. Anyone who can furnish the proofs of the various formulæ given in any one of these books need have no fear of an examination in the subject with which it deals.

"*The Marconi Review.*"

We have received the first three numbers of *The Marconi Review*, a monthly publication issued by Marconi's Wireless Telegraph Co., the first number of which appeared in October last.

These numbers contain the following interesting articles, amongst others, viz.: A chapter in the History of the Marconi Beam (in two parts), Discussion on Short-wave Fading (also in two parts) and Commander Slee's presidential address of Nov. 7 to the Institution of Electrical Engineers, on "The International Radio-telegraph Convention of Washington, 1927."

We should like to extend to our new contemporary a hearty welcome and to express the view that if it maintains its present high standard it will adequately fill the vacant niche which has been waiting so long for some such effort in this country.

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TELEGRAPHIC MEMORABILIA.

AUSTRALIA.—Telegraphists in the Cable and Wireless Section of the C.T.O. were among the first to obtain knowledge of the disastrous fire at Ballan, the Australian Beam station, on Dec. 28 last, and the following interesting items are culled from *The Electrical Review* and the London *Times*:—

"The costly equipment of the 'beam' wireless-telegraph station at Ballan, about 50 miles from Melbourne, narrowly escaped destruction on Dec. 28, when the roof of the engine-room was destroyed by fire. The fire-fighting equipment of the station proved inadequate, and until the arrival of the fire-engine from Ballarat, two hours after the fire broke out, little could be done to check the blaze. The fire burned for three or four hours and damaged the generators. It is understood that the transmitter at Ballan was severely damaged by fire and water, and was not expected to be available for service for some days. The temporary service was maintained through the international broadcasting transmitter at Pennant Hills, Sydney, which is being controlled by a land line, 500 miles long, from Melbourne. This station only maintains one circuit, so that simultaneous transmission to Canada and Great Britain was impossible, but the cables assisted to relieve the congestion. The British Broadcasting Corporation's proposed attempt to relay New Year greetings from Australia to listeners in the British Isles had to be abandoned because of the dislocation of the service caused by the fire."

The Governor-General, in Council, has approved of the sale to Amalgamated Wireless (Australasia), Ltd., for £39,574 of 25 Government wireless-telegraph stations, which have been operated for the Commonwealth by the company for some time past.

The *Wireless World* reports that an agreement has been reached between the Commonwealth Government and Amalgamated Wireless (Australasia), Ltd., that the company's patent rights shall be made available free of charge to all wireless trade broadcasting companies and listeners for a period of five years, dating from November, 1927. To carry out the arrangement the company has made heavy sacrifices, adds our informant, including an estimated sum of £62,500 on listeners' licences and a similar amount on valve royalties, in consideration of which the company will receive from the Government 3*d.* per month, or an average of 3*s.* per annum, in respect of every receiving licence issued. On a basis of 250,000 licences, the amount received by the company will be £37,500, or £88,000 less than was originally claimed.

Preliminary recommendations for the reorganisation of the broadcasting services in Australia have been submitted to the Federal Ministry by the Broadcasting Committee. The Ministry will in future provide all stations and equipment, and will lease the right to provide programmes to a single organisation. Class A station leases will be for three years, and it is unlikely that Class B stations will be increased in number, they being auxiliary and obtaining their revenue mainly from advertisement. The scheme is not expected to become effective for some months.

AUSTRIA.—Last month "*Massage and Radio*" were associated in the Austrian news. This month the Radio correspondent of the *Daily News* gives us the information from Vienna that Professor Siedel has discovered a happy connexion between *wireless waves and milk!* The Viennese professor states that "warm milk submitted to high-frequency oscillations will remain sweet for a month."

BRAZIL.—From more than one quarter we learn that Brazil and Peru have signed a three-year radio-telegraphy treaty by which a service will be established between the stations of Iquitos (Peru) and Cruceiro do Sul (Brazil) when the treaty is ratified.

CANADA.—*The Electrical Review* states that it is announced in Ottawa that the Commission which has been appointed to investigate radio problems and broadcasting methods consists of Sir John Aird, president of the Canadian Bank of Commerce, Mr. C. A. Bowman, editor of the *Ottawa Citizen*, and Mr. Augustin Frigon, director of the Polytechnic School in Montreal. The Commission is to visit England and Europe.

The Canadian Minister of Marine, it is also stated, has licensed 68 broadcasting stations, 32 of which provide intermittent services at low power and of purely local interest. Some 60% of the receiving sets in use are classed as urban and 40% as rural.

CZECHO-SLOVAKIA.—From an excellent source it is learnt that the Czecho-Slovakian broadcast radio-telephone organisation is building a chain of five transmitting stations to complete the very efficient service in that country. The new high-power station shortly to be erected by Marconi's Wireless Telegraph Co., Ltd., at Bratislava will be one of the largest of them, and it will serve that country in the equivalent manner to the British Broadcasting Corporation's regional stations in the British Isles.

FRANCE.—Owing to its unfortunate financial position, says *The Electrical Review*, the Montpellier Radio Club has been taken over by the French Post Office.

The Paris correspondent of the *Daily Telegraph* says that the French Government have for some time been disturbed by the draining of the rural districts of their young men and young women, who prefer the bustle of the city to the dulness of country life. Broadcasting is to be the remedy, and M. Martin, Under-Secretary of State for Posts and Telegraphs, is devoting himself to its development. He has drawn up a scheme for the establishment of three powerful national broadcasting stations and seven or eight smaller ones, so placed as to keep in touch with all the rural areas of France. By means of underground cables he proposes that these stations should be able to relay the programmes of the principal stations, including operas and plays performed in Paris.

GERMANY.—It is understood that the Germano-Argentina wireless telephone service, opened to the public in December, is operated by means of land lines from the exchange of the Transradio Company to the wireless station at Nauen, and thence by direct transmission to Buenos Aires by means of a short-wave transmitter.

Insurance against Wireless Risks!—*World Radio* announces that the Reichs-Rundfunk Gesellschaft has concluded arrangements with five insurance companies whereby free insurance against liability for accidents caused by wireless apparatus and aerials will be included, from Jan. 1, 1929, in the ordinary listening licences granted in Germany and the Free State of Danzig. The insurance will cover liability to third persons and their property to the amount of £5,000 and £1,250, respectively, the liability of tenants to landlords being included.

GREAT BRITAIN.—*Birmingham.*—At the Birmingham University Professor E. V. Appleton (of King's College, London), in a lecture on the "Electrical Structure of the Upper Atmosphere," and, according to the *Birmingham Post*, in answer to his own question, "What was the shortest wave-length which the Heaviside layer would reflect back?" made an interesting statement, which is substantially as follows: "It was thought that with waves of five metres or less the layer could be penetrated. Recently it had been found that curious echoes of wireless signals were being obtained many seconds after they were sent out. For example, Professor Störmer had heard signals from station PCJJ working on 30 metres. That revolutionary result had been confirmed by various investigators. Professor Störmer suggested that the echoes were produced by waves which had penetrated the Heaviside layer and had gone out into space and been reflected back by electricity shot out from the sun. That hypothesis was most attractive, and appeared to fit with the times at which the echoes were observed."

Blackburn.—Wireless users who have eliminators are being advised to apply to the Blackburn electricity manager concerning dangers they run with sets not properly constructed.

Bolton.—*The Times* reports that at the Bolton Borough Police Court in December last a motor engineer of Bolton was fined £5, and ordered to pay £5 5*s.* costs and to suffer the confiscation of his apparatus, for using a wireless transmitting set without being licensed to do so. Mr. F. Elliott, prosecuting for the Postmaster-General, said this offence was a serious one. The transmitting set had been used for two years, and it had taken all that time and much expense to detect the user of the call sign "ORS."

Burnley.—Eliminators yet again!—Certain residents at Burnley have claimed compensation for alterations of their radio receiving apparatus which have been necessitated by the alteration of the municipal electricity supply system serving their houses. Some of the claims are to be repudiated, whilst others have been referred to a Committee.

Tonteg (Glam.).—Aerials and Overhead Cables.—A collier, of Maesteg Grove, Tonteg, was changing an aerial wire from the front to the back of his house. To do so he had to pass it over the roof, above which ran an electric light cable bearing 230 volts.

When the wire was raised it snapped and touched the electric cable. Both he and his wife were electrocuted.

Simultaneous Radio-Telegraphy and Telephony.—*The Times* states that experiments with short-wave beam wireless with a view to proving that two or three telegraph messages and a telephone message may be sent in either direction at the same time over the same radio circuit are approaching completion. For a little more than six months they have been in progress between Bridgwater, in Somerset, and Montreal with one set of apparatus and one aerial.

The Electrical Review adds that for the purposes of the experiments the Post Office has allowed the Marconi Company to use its beam station at Bridgwater, which was built by that company for the Post Office in 1926, and is the receiving station for the commercial telegraph service between England and Canada. The experiments have been quite independent of the ordinary service, and have not in any way impeded it.

The "outery," rather feeble, one is forced to say, at the announcement that the B.B.C. contemplated spending something in the neighbourhood of four to five hundred thousand pounds on new broadcasting headquarters, which the *Daily News* radio correspondent declares on "high authority" is to be rented by the Corporation at no less than £46,000 per annum, has petered out. Indeed, there was practically no support for such a protest in well-informed and technical circles.

The Electrician, commenting on the criticisms, says: "The technique of British broadcasting cannot be rivalled, even with our present broadcasting conditions; when the new building is put into service, however, the 'balance' of the London transmission, at any rate, will leave the rest of the broadcasting world even further behind."

The accomplishments of British broadcasting, when recorded, should surely satisfy the most niggardly licence-holder, who possibly considers that he is overcharged by his annual subscription of ten shillings!

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It is perhaps well worth while to quote just a few facts concerning the work of 1928, when an aggregate of 68,000 hours comprised the programmes from 21 stations, with a total breakdown for the entire 366 *days* being less than twenty-four *hours*!

The new regional transmitter at Brookman's Park was commenced in May last, and will be the first twin-wavelength high-power station of its kind in the world. The number of listening *groups* has increased from 60 to 160, the L.C.C. and many other schools have proved its educational value while experimental use was made and is continuing with adult education in circles so wide apart in character as the R.A.F., the British Legion and in our prisons. Not least of all has the service given no less than 13,826 free licences to the blind of these islands.

Radio Pictures.—The British Broadcasting Corporation announces that an agreement has been reached with Wireless Pictures (1928), Ltd., under which the company will continue to transmit pictures by wireless until Oct. 30, 1929, instead of ceasing at the end of 1928.

Talking Kinematography.—Talking films for the home and the reception of *still* photographs on the same apparatus are made possible, it is claimed, by an invention of Mr. G. V. Dowding, which *The Times* understands is shortly to be demonstrated to the B.B.C. A projector is run at the broadcasting station, and synchronisation of all the listeners' projectors is achieved in an extremely simple manner. At the broadcasting station the play is spoken by artists watching the film, and effects and music are arranged in a similar manner.

Picture Telegraphy.—At an informal meeting of the Institution of Electrical Engineers on Nov. 26, Mr. E. S. Ritter opened a discussion on "Picture Telegraphy," which, he said, was now an ordinary commercial process. Lantern slides illustrated the different forms of apparatus, their internal mechanism, and diagrams of connexions; the Bell, Belin, Siemens-Carolus, Bart-Lane, and Marconi systems were some of those described and compared. Alternating current was generally used, as it was more easily transmitted over a telephone line, its frequency being chosen to suit the line characteristics. At present in all picture transmission some sharpness must be lost, and a photograph was reckoned to be critically sharp if the smallest dot did not exceed 5 mils in diameter. Mr. W. Cruickshank discussed the practical field for picture telegraphy, and said that for sending symbols, diagrams, or special type, the picture telegraph was easily the best; it was being used in Japan and China for transmitting documents in the 4,000 or so native characters that had no alphabet.

On Dec. 19, thanks to the enterprise of the proprietors of the *Daily Telegraph*, the White Star liner *Olympic* brought ashore at New York the first wireless pictures ever sent from land and printed on board a ship.

The pictures were received by a "Fultograph" machine on the upper deck of the liner.

Mr. Monkhouse, the wireless operator, reported that the reception was good on every day except the last, when atmospherics interfered with the artistic value of the pictures, but did not prevent reception. Experience on the third day showed that the aerial of 70 ft. might be extended, and on the fourth day out an aerial of 150 ft. was provided, with the result that reception at 2,300 miles was very good.

Messrs. Robertson and Stedeford, of the *Daily Telegraph* staff, were responsible for the mechanical side of the production and the distribution of the illustrated broadsheet to the passengers.

The Commission of the Union Internationale de Radiophonie, specially concerned with programmes and administration, held four meetings in London during the week ended Dec. 15 at the headquarters of the British Broadcasting Corporation, under the chairmanship of Mr. Oscar Czeija (Austria). Amongst other business, draft forms were drawn up for uniform programme statistics, and for the exchange of information concerning dramatic works suitable for broadcasting; special attention was given to the study of broadcasting to schools. The peculiar fact, however, is that this "wireless parliament," with its own "council" and "cabinet," has no official rights; it is a representative body working for the good of international broadcasting. It represents 20 European countries, and even countries outside Europe are associate members, as the difficulty of meeting (the Union's headquarters are at Geneva, Switzerland) prevents them becoming full members.

HOLLAND.—Having been the first European country to establish a short-wave transmitter with a world-wide range to enable her to communicate with her colonies, says *The Electrical Review*, Holland again took the lead on Dec. 6, when the Hilversum (PCJJ) station commenced weekly schedule transmissions at such times and in various languages so arranged as to be received in distant countries under the most favourable conditions.

The Dutch newspapers report, states Reuter, that, after months of discussion, the League of Nations has decided to lay down direct cable connexion between Geneva and the Dutch short-wave wireless station at Kootwijk for the purpose of broadcasting the sittings of the League.

Readers will recall that this was mentioned under "Switzerland" in the January issue of the *T. & T. Jnl.*

HUNGARY.—*A Suggestion for British Railways?*—A regular radio-telephone broadcast reception service on the Hungarian State Railways was inaugurated in November. For 6*d.* an hour hygienically wrapped headphones above every seat, including third class, excellently transmit Hungarian and foreign programmes. Headphones in the waiting-rooms at all the Budapest stations are greatly in favour, especially with third-class passengers.

ISLE OF MAN.—Submarine cable telegraph communication between the mainland and the island, which was interrupted on Dec. 24, 1928, was restored at 9 p.m. on Jan. 2.

Wireless communication with the island was, however, established on Dec. 29 by the Post Office authorities on two routes between the mainland and Douglas. A wireless-telegraph station at Fleetwood, to establish temporary communication with Douglas, was housed in the hutment barracks on land belonging to the War Office. Direct wireless communication with Douglas was also instituted from the R.E. barracks in Mason Street, Liverpool.

MALAYA.—Direct telegraphic communication in both directions between Singapore and London has been established by the Eastern Telegraph Company, thus eliminating the relaying stations.

MEXICO.—One of the last official acts of the former President Calles, says an electrical journal, was to sign a decree granting to the A.E.G. a concession for the establishment of a wireless station in the vicinity of Mexico City. The cost of the equipment is put at 550,000 dollars, and is to be refunded to the A.E.G. by the National Telegraph Lines Organisation out of the surplus which traffic with other countries will yield. The station will provide a direct means of communication between Mexico and Europe and the whole of South America. A sum of 50,000 dollars will also be expended on the station buildings.

NORTH AFRICA.—It is understood by *World Radio* that the 10-kw. transmitter constructed near the old town of Carthage, 50 km. from Tunis, will soon commence operation on a wavelength between 300 and 400 m. It is connected by means of a special land line with the studio, which is in Tunis itself. Tests on a wavelength of 1,825 m. were recently carried out.

PERU.—(See Brazil, above.)

RUSSIA.—Reuter's Leningrad agency reports that apparatus for the transmission of photographs by wireless has been received from Germany and installed in the Central Telegraph Office at Leningrad, to enable pictures and writing to be transmitted from Leningrad to Moscow by the telegraph wire and wireless systems.

SPAIN.—Reuter informs us from Madrid that the Council of Ministers approved on Dec. 21 of a scheme for the provision of a wireless service between Madrid and Cuba.

U.S.A.—It is announced that a company, with a capital of ten million dollars, says Reuter, has been formed to manufacture and sell broadcast picture receiving sets for installation in private houses. Programmes of still pictures have been broadcast from a number of New York stations for the past six months.

According to *Science*, adds the *Electrical Review*, amateur radiovision enthusiasts will soon be able to receive from 21 stations operated by 11 different broadcasters. Nine are now broadcasting, while two have their stations under construction; several others have applied to the Federal Radio Commission for authority to enter this field, but so far have neither been granted licences to operate nor construction permits.

An Important Patent Decision.—The *Wireless Trader* reports that patent litigation, which has lasted 11 years and probably cost the litigants more than £200,000, has just been terminated by a decision of the Supreme Court of the United States. The decision establishes that Dr. Lee de Forest, and not Major Edwin H. Armstrong, was the original inventor of the regenerative or feed-back circuit. The Supreme Court's decision in favour of Dr. de Forest has a special significance at the present time owing to the fact that further litigation is pending in the States on the question of Dr. de Forest's talking picture rights in the "Phonofilm" process. It is estimated that at least one-half of the radio sets now in use in America embody the "regenerative" or "feed-back" circuit, which makes the three-electrode valve an oscillator or transmitter.

A dispute which has been exercising the American radio industry for some time has been won by the General Electric, Radio Corporation, American Telephone & Telegraph, the Western Electric, the Westinghouse Electric, the International Radio Telegraph and the United Fruit & Wireless Specialities Apparatus Companies, whose opponents are the Radio Protective Association, representing independent concerns, which claims that the firms mentioned are monopolising the manufacture and sale of radio equipment. The Federal Trade Commission has dismissed the complaint, deciding that it is without jurisdiction to prosecute. The *Wireless World* reports that the Radio Protective Association will resume the attack by pressing the Department of Justice to take the case into Court.

The directors of the Radio Corporation of America and the Victor Talking Machine Corporation approved of the proposed merger on Jan. 15 last.

That well-known and much-respected scientist, Dr. E. F. W. Alexanderson, of the American General Electric Co., addressing the International Civil Aeronautics Conference in the United States, claimed to have devised apparatus which will dispatch a wireless wave from an aeroplane to the ground and, by the speed of its rebound, indicate to the airman with the aid of coloured lamps on the dashboard the height of his machine. A mechanical attachment for use at 10 or 15 ft. will indicate in a similar way when to begin landing with safety in darkness or fog.

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GENERAL AND PERSONAL.—*Parliamentary Queries and Replies.*—On Dec. 11 Mr. Kelly asked the President of the Board of Trade if he would state whether regulations were making it imperative for all ships to have wireless transmitting and receiving apparatus, with at least one qualified operator and a continuous wireless watch, human or efficient automatic; and did this apply to all ships in the lighthouse service?

Sir P. Cunliffe-Lister said the present British law and regulations required all passenger ships and all ships of 1,600 tons gross or more to be provided with wireless apparatus and at least one operator; and if they carried more than 50 persons they must keep a continuous watch. Lighthouse tenders would not be subject to the requirements unless they came within one of those classes.

In reply to Sir C. Kinloch-Cooke, Sir P. Cunliffe-Lister said that he was not aware that any recent disasters at sea had been caused by insufficient wireless apparatus on British ships. The establishment of uniform standards in the matter of wireless on all ships could only be effected by international action, and the question of establishing such international standards would be one of those to be considered by the International Conference on Safety of Life at Sea, which would meet in London in April next.

On Dec. 19, Sir W. Mitchell-Thomson informed Mr. Wellock that the total capital cost to the Post Office of the four Imperial beam wireless services was approximately £242,200. There was an annual royalty payable to the Marconi Company so long as any of its patents were employed in the stations.

The Prime Minister also informed Captain Wedgwood Benn that the consent of the House of Commons will not be sought before the Postmaster-General leases the beam wireless system. The lease will be granted under the general powers conferred upon the Postmaster-General by the Post Office Act of 1908. There is no necessity to submit for approval of Parliament the details of the contract with the Communications Company in reference to the sale of the cables.

The Merchant Shipping (Convention) Act, which was passed by Parliament in 1914, but has never come into force, has been postponed for another year by an Order in Council. It is now due to come into force on Jan. 1, 1930, but in view of the fact that many of its provisions are obsolete, and of the International Conference on Safety of Life at Sea which is to be held in London in the spring, it is unlikely that it will ever operate.

Private Companies.—The Anglo-American Telegraph Co., Ltd., has declared the following final dividends: Ordinary consolidated stock £1 10*s.* per cent. (making £3 15*s.* per cent.); and preferred stock £1 10*s.* per cent., making £6 per cent. The deferred stock is to receive a dividend of £1 10*s.* per cent. for the year. These rates are similar to those paid for the preceding year.

The Direct W. India Co., Ltd.'s profit for the year ended June 30 last, after deducting income tax, was £16,184. A balance of £12,652 brought forward is added, making £28,836. After meeting the 2½%, free of tax, interim dividend, there remains a sum of £23,889, which has been transferred to the general reserve fund.

The directors of the Eastern Extension, &c., Telegraph Co., Ltd., have declared the usual quarterly dividend of 5*s.* per share, free of tax, in respect of the three months ended Sept. 30 last.

The Eastern Telegraph Co., Ltd.'s ordinary dividend of 2½%, tax-free, has also been declared for the same quarter.

The Great Northern Telegraph Co., Ltd., have also announced a dividend of 2½%, payable as from the 1st of last month.

The net result of the working of the Halifax and Bermudas Cable Co., Ltd., for the year ended June 30 last, after deducting income tax, was £31,244. To this is added £82,083 brought forward, making £113,327. An interim dividend of 10%, free of tax, was paid in February last; the balance, £108,327, is transferred to the general reserve fund. The directors propose to pay a bonus of £12 per share from the latter fund, absorbing £120,000.

The International Telephone & Telegraph Corporation have declared a regular quarterly dividend of 1½%, payable as from 15th ult. To finance the purchase of the United River Plate Telephone Co., Ltd., and for other purposes, the Corporation is making an issue of 10-year convertible 4½% gold debenture bonds. Holders of the bonds will be able to exchange them for common stock at the rate of $200 per share up to July 1, 1932, or thereafter at a higher rate.

The resolution for the alteration of the Marconi International Marine Communication Co., Ltd.'s articles of association to ensure that the British control of the company shall be maintained was duly confirmed at an extraordinary general meeting on Dec. 31 last.

For Our Advertisers.—Contracts open.—Quote full reference and apply Department of Overseas Trade, London, S.W.1.

New Zealand Post and Telegraph Department. Feb. 12.—Supply of v.i.r. wire (No. P. and T. 151/1184) (reference B.X. 4,951); also supply of dry cells for telephone work (P. and T. 151/1205) (reference B.X. 4,991). Feb. 19—Supply of bronze wire and copper binding wire (reference A.X. 7,252); also supply of 120,000 galvanised steel spindles for insulators (reference B.X. 4,948). Feb. 28—Supply of six-conductor telephone cordage (No. P. and T. 151/1234) (reference B.X. 4,990). March 12—Supply of switchboard cords (P. and T. 151/1247) (reference B.X. 5,017). March 26—P.M.G.'s Department, Melbourne—Supply of telephones and dials (schedule C. 401, reference B.X. 5,023). It is also estimated that 2,000 wireless sets will be required in East Africa during the next 12 months. Those interested should also apply to the D.O.T. as above, but quoting report of Office of H.M. Trade Commissioner in East Africa and B.E. Africa Broadcasting Company.

To the staff of the Cable Room, C.T.O., one would wish to tender sincerest congratulations on the four Assistant-Superintendent and the 20 Overseer posts which have now been made substantive. The announcement, I understand, was made on Christmas morning, a much better date than April 1!

The tributes to the memory of the well-beloved John Lee have been numerous and reveal how wide were his interests and activities.

In *The Electrician* of Jan. 18 there appeared "An Appreciation," by Sir Charles Bright, who voiced the fear of many of those who had watched how unreservedly he threw himself into every task he undertook, for, as Sir Charles writes, "Probably his undoing for this life was that he could never spare himself properly—despite doctor's warnings—owing to a profound enthusiasm for work."

Personally, it will be a lasting regret that I did not know of the City memorial service until the day after it took place.

It is not too much to say, however, that having read with the most intense feeling and sympathy an account of that "In Memoriam" held in the old church of the Grey Friars, off Newgate Street, by Mr. W. H. F. Webb under the title "Vale!" in the columns of the *Overseas Telegraph*, one has been able to visualise with eyes and mind something of the beauty and the reality of that "fine tribute," that "symbol of the memorial erected in the hearts of those who enjoyed his service and his friendship."

One would, if he could but the space is not mine, reproduce "Vale!" in its entirety, but must content myself with the four lines with which W. H. F. W. closes, thus:—

"Not wealth—not power—not all the gifts of art
Appraise the pilgrim at his journey's end:
But this alone—the tribute of the heart—
That none more nobly bore the title: Friend!"

J. J. T.

JOHN LEE, C.B.E.

PERSONAL RECOLLECTIONS.

THE obituary notice in *The Times* gives an admirable summary of the career of one of the most remarkable public servants of our time; and we who knew him well are tempted to amplify the record in order to recall John Lee in his many-sided character and give a clearer idea of the man to those to whom he is only a name.

My interest in him dates from about 1906, when I was struck by the intelligence and literary skill of the reports on telephone traffic matters which came from the Liverpool Post Office. From the late Mr. Salisbury, then Postmaster Surveyor of Liverpool, I learnt that they were the work of one of his Assistant Telegraph Superintendents, who, leaving school at the age of 14, had educated himself in classes at Liverpool University, where he was then a lecturer. He was a B.A., wrote reviews for the *Liverpool Post*, gave lectures on social subjects, and was one of the best after-dinner speakers in the city. Soon afterwards it was decided to appoint at Headquarters two Telephone Traffic Managers. For one of these posts Mr. J. Stuart Jones—now controller of the C.T.O.—was marked out by his past work at Headquarters; and we were fortunate to persuade Mr. Lee to accept the second post, although removal to London meant the loss of an income of £200 a year earned outside official hours, chiefly in journalism and lecturing in the Liverpool district. Stuart Jones and Lee became known as the David and Jonathan of the telephone service. They surmounted all the personal jealousies with which they were faced, made the local postmasters and telegraph superintendents their firm friends, and got things done with the minimum of friction and the maximum of goodwill. The present efficiency of the Trunk Telephone Service as an organisation is largely due to their energy, their thorough practical knowledge of every detail, and their readiness to experiment.

It was not easy for the Post Office to keep hold of a man of John Lee's many interests, and certainly on two occasions he all but made up his mind to retire and take up literary work.

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He was a deeply interested Anglo-Catholic, a friend of bishops, deacons, and heads of colleges, a lay reader licensed to preach in several dioceses. He spoke at conferences; he wrote for the *Church Times* and edited *The Treasury*. He contributed to *The Times Engineering Supplements*, and was, I believe, later offered a regular post on the premier newspaper. He wrote two or three books himself—one as a thesis for his M.A. degree on the "Economics of Telegraphs and Telephones," and one of his latest tasks was to edit a series of books on social and industrial topics. Most of this literary and social work was done while carrying a full load of official duties; and it is difficult to see how he could have effected much more if he had given up the Post Office. Fortunately for us, he decided to remain.

In 1917, while I was temporarily absent from the G.P.O., he applied for, and obtained, the Postmastership of Belfast, an office with a reputation for serious staff difficulties. I wrote asking why he had taken this step; and he replied that he had written so much about the proper spirit and method of dealing with staff that he thought he ought to put his ideas into practice. He said he had left behind his Head Postmaster's Book of Rules, but had taken with him his Greek Testament. He later described how he was meeting regularly every section of the staff—Catholic postmen, Protestant postmen, Catholic sorters, Protestant sorters, &c., &c., learning what were their difficulties and grievances and explaining changes in regulations and routine. Lee never forgot his experiences when he was in the lower classes of the establishment, and his sympathies were always with those at the bottom. When he left Belfast to become Controller of the C.T.O. he received remarkable tributes of affection from the whole staff, including his critics. Lee made his mark also in the life of the City of Belfast. A lecture which he gave on the duty of the University to Commerce had the practical result that a large sum of money was raised to provide a reference library on commercial subjects. He took a University degree in Commerce, and encouraged his subordinates to attend university courses, especially in history and political science. One day the late Lord Pirrie—the great shipbuilder—came into Lee's room at the Post Office and said he proposed to found and endow a labour college at Belfast; and asked for Lee's advice and co-operation. Lee pointed out that such a scheme would be regarded by the Labour Party as a device for propaganda on behalf of capitalism, and suggested that Lord Pirrie should rather provide additional facilities for the operatives to attend the ordinary courses of the University.

The desire to open up the benefits of university education to the operative sections of the community led later to Lee's great scheme of affiliating the Central Telegraph Office to Balliol College, Oxford. The practical difficulties, unfortunately, proved too serious for its adoption; but it was a great idea, and a credit to Lee and the Master of Balliol.

Enough has been written to show the originality of Lee's ideas and the scope of his attainments. With these went an admirable wit and eloquence, the whole inspired with the genius of friendship and true brotherliness towards all—high and low—with whom he came in contact. He always preferred not to appear as the author of one of his schemes, but to get others to undertake responsibility and to assist them modestly in the background. He was a true co-operator. L. T. H.

THE ST. JOHN AMBULANCE ASSOCIATION.

THE Annual Competitions for the London Postal Ambulance Challenge Shield—Holders, Savings Bank Department—open to all Male Officers in any department of the London Post Office, and for the Women's Trophy—Holders, Accountant-General's Department—open to members of the Women's Branch of the P.O.A.C., will be held on Tuesday, Nov. 20, 1928, at 7.30 p.m., in the King George Hall, Caroline Street, Great Russell Street, W.C.1 (2 mins. Tottenham Court Road Tube Station). Admission by programme, 3*d*., and a limited number of seats will be reserved at 1*s*. each.

Please all endeavour to be present and so help the P.O.A.C. and give encouragement to the members in their work.

Tickets obtainable from Miss E. K. M. Meeser, L.T.S., Cornwall House, Waterloo Road, S.E.1, and Mr. J. E. G. Rogers, I.S., G.P.O., Mount Pleasant, E.C.1, Joint Competition Secretaries; and all other Branch Secretaries.

INTERNATIONAL TELEPHONY.*

BY H. TOWNSHEND.

ONE must, I think, begin a review of the administration of international telephony by considering from an abstract and idealistic standpoint what is its theoretical object or scope; it is then easy to get down to earth again by glancing at the history of what has actually been done towards attaining this object; only by this—I am afraid rather tedious—route can one reach a viewpoint giving a perspective of the current administrative problems.

Theory.—Scope of International Telephony.

For idealism, especially about telephones, one turns naturally to the United States of America; and the best definition I know of the object and scope of international telephony can be derived from a statement which Mr. Gifford, the President of the American Telephone and Telegraph Company, made in the report of that company to its stockholders for the year 1926. Before citing it, I should remark that the American Telephone and Telegraph Company operates the whole of the long-distance telephone service of the United States and controls, by means of associated companies, three-quarters of the telephones providing local service in North America. Although, as everybody knows, telephony is so highly developed in North America, *international* telephony has been, until recently, a European product, for obvious geographical reasons; and what Mr. Gifford laid down was in fact the ideal scope of *national* telephone service. This is what he says: "The deal aim to-day of the American Telephone and Telegraph Company and its associated companies is a telephone service for the nation, free, so far as is humanly possible, from imperfections, errors or delays, and enabling at all times anyone anywhere to pick up a telephone and talk to anyone else anywhere else, clearly, quickly, and at reasonable cost." I think you will agree that this definition, which carries with it the authority of the practical experience of the head of by far the largest single telephone organisation in the world, does not fail in idealism. What is aimed at is clearly no less than the elimination throughout the territory of the United States of distance as a bar to personal conversation. No doubt the "ideal aim" of *international* telephony should be to eliminate also another bar besides distance, namely, separation by political frontiers.

Transmission of Calls.—Bell's Invention.

Since the energy which the human voice produces can only be made to carry a few hundred yards at the outside in the form of sound waves in the air, if it is to reach the recipient in a form audible to the human ear, the fundamental requirement of a telephone service—speech at a distance—which was provided in a workable commercial form by Bell's invention of the telephone in 1876, is a means of first transforming some of the energy of the local sound-waves produced in the air by the human voice into modulated groups of electric waves of the same frequency; of then conveying a detectible and recognisable proportion of these electrical waves to a distant point, and finally, of there re-transforming them or their remains into sound waves having a close resemblance to the originals successfully to deceive the human ear of the listener into thinking he is hearing what the distant speaker is saying. This conjuring trick—in which there is positively much more deception than is popularly supposed—is the province of the telephone transmission engineer; which, having defined it, I hope to succeed in avoiding. But it is, of course, obvious that it is the various methods of long-distance transmission which necessarily determine the physical and economic conditions in which international telephone service has to be administered; and I shall therefore have to refer in general terms to transmission methods later. It may be remarked in passing that, while the telephone itself—both transmitter and receiver—remains in essentials very much the same as it was 50 years ago, the methods of *conveying* small voice-frequency electrical currents from one point of the earth's surface to another have developed enormously in efficiency and, indeed, so far as long distances are concerned, have been radically transformed within the last 10 years or so. That is why long-distance telephony (and so international telephony generally) is a comparatively recent thing.

Direction of Calls.

To use the telephone to provide a public service necessitates a second requirement, viz., the provision of means of *directing* the electrical waves which silently embody each speaker's voice from his telephone to another telephone placed at the ear of the proper recipient and to that telephone only. This is not wholly an engineering problem, as you will see when we come to what is known as the person-to-person call, but of course the principle thing is the very technical business of isolating from each other the æther connexions between telephones and concentrating them in groups—called exchanges—situated at selected points, provided with means of alternative intercommunication by switching—whether by a human operator or by automatic plant. The obvious way of doing this is to concentrate the electrical waves carrying each pair of conversing voices in or round a physical channel, such as a wire or pair of wires, along which the conversation in its silent electrical stage can pass; and fortunately it happened that this was precisely the normal way in which ordinary electrical waves were handled,

* Paper read before the Institute of Public Administration on 13 Dec. 1928.

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e.g., in telegraphy, at the date when the telephone transmitter and receiver for converting sound waves into electrical wave-groups and *vice versa* were invented. Thus, Bell's invention immediately provided both the two essential requirements of a *public* telephone service—at least for moderate distances. It is of interest to note that Bell himself was farsighted enough immediately to foresee the consequences of this fact. I will read what he said in 1878 (the year when the first telephone exchange in the world was opened with about 20 subscribers in the town of Newhaven, Connecticut). I am quoting Bell's words from Mr. Gifford's report, cited above. "It is conceivable that cables of telephone wires could be laid underground or suspended overhead communicating by branch wires with private dwellings, country houses, shops, manufactories, &c., &c. . . . Not only so, but I believe in the future wires will unite the head offices of the Telephone Company in different cities, and a man in one part of the country may communicate by word of mouth with another in a different place."

Wires and Wireless.

The point I want to make is that we are still developing on the lines foreseen by Bell in 1878. The enormous majority of telephone conversations are, and are likely to continue to be, carried throughout along wires, a method which vastly facilitates the problems of isolation, concentration and direction; and, although the technique of producing and handling waves of electrical length in free, or comparatively free, æther was invented 20 years or so after the telephone and has made enormous strides recently, the present position is that the use of radio—so-called wireless—for connecting telephones is, in the main, associated not with public telephone service, but with broadcasting—i.e., simultaneous communication in one direction only between one telephone and a large number of others, a use for which it has obvious natural advantages. I want to emphasise this, because people are now so familiar with the achievements of radio in broadcasting that they are apt to look at its prospects in connexion with the development of public telephone services—national or international—in false perspective, and to suppose that red tape or administrative sloth is the only obstacle preventing them from ringing up their friends "by wireless" successively at the South Pole, on board the *Mauretania* in mid-Atlantic, and on the Island of St. Kilda. (I have chosen these examples because they are at the same time quite imaginary and typical of 3 classes of actual case.) The sober truth is that in all cases an enormous *technical* gap has to be bridged between getting a voice across by radio under certain conditions and in one direction from one specially-arranged and located telephone to another, and providing a public telephone service between two areas enabling people to chat to each other from their own houses at their ease; and, in fact, in the existing state of progress, no telephone engineer would have recourse to radio for a public telephone service except to bridge a gap, e.g., over a broad ocean or a desert, across which for some reason it is not feasible to lay a cable or to construct a pole route. I will return to this later. Meanwhile, while we are still more or less in the realm of theory, I want to mention one rather obvious point because it is fundamental. While it is the technical progress in long-distance point-to-point transmission—by cable or exceptionally by radio—which directly governs the possibilities of international telephony, it must not be forgotten that the long international circuits are not in themselves sufficient to provide a telephone service at all; they can only link up the local and national systems which have been built up by prolonged and extensive technical efforts directed to solve problems partly of a different order—e.g., switching equipment; and the practical success, as distinct from the theoretical possibilities, of international telephony depends directly on the efficiency of the local and internal trunk systems of the countries so linked up. A full recognition of the implications of this fact is the first condition of successful administration of any international telephone service.

History.—Pre-war.

So much for pure theory; now to get down to practice by way of the history of the development of international telephone services. I have mentioned that the telephone was invented in 1876 and the first local telephone exchange was opened in America in 1878. On this side of the Atlantic the first exchanges were opened in the same or in the following year in several European countries. Although both local and long-distance telephony developed more rapidly in North America than in Europe, the need for international telephony on any considerable scale was first felt and first met on this side of the Atlantic, because of the comparatively small size of the European national territories and of the existence in Europe of highly-industrialised districts, often not very far apart and with close commercial relations, separated by one or more national frontiers. There has, of course, been for many years an excellent telephone service across the Canadian-United States Frontier, and more recently service has been opened between those two countries and the principal towns of Mexico and Cuba, but, speaking broadly, international telephony on a large scale has so far been a European product and, without violating a due sense of proportion, I can therefore confine the very brief illustrative summary of the history of international telephony for which I have time to the story of what happened in Europe.

Further, in order to cut this part as short as possible, I will still further confine it in the main to the services with which this country is concerned, i.e., the Anglo-Continental telephone services, premising, subject to certain qualifications which I will mention as I go on, that their history may be taken as fairly typical of the history of European international telephony up-to-date.

The British overseas telephone services are a good deal older tha nmany people think. The first one, the Anglo-French service, was opened as long ago as 1891, only 12 years after the establishment of the first telephone exchange in England, and 15 years after the invention of the telephone. The traffic rose rapidly and by—I think—1893 the service had already become the subject of a joke in *Punch* (this joke, however, contained no reference to wrong numbers). Two new cables were laid in 1897, when a circuit to Lille was also opened, and in 1904 a good many provincial centres both in France and in Great Britain were admitted to the service. By the outbreak of the War two more Anglo-French cables embodying material technical improvements had been provided.

The first extension of the telephone service beyond France was naturally to Belgium; but this did not follow for 10 years after the opening of the first line to Paris. In 1897, when the London-Lille circuit was opened, there had been a project to prolong it by Continental land-lines to Brussels, but eventually a direct Anglo-Belgian cable was laid in 1901. It proved a failure, but another one was successfully laid in 1902 providing two circuits. By the outbreak of the war a second cable had been laid, and proposals were on hand for two more; these cables contained only two telephone circuits each.

A rather primitive service to Switzerland via France was also opened at the beginning of 1914; and an Anglo-Dutch service was projected and had got to the point at which the cable had actually been manufactured but not laid. A service with Germany was also under discussion.

It will be seen that, in the 23 years which elapsed between the birth of the Anglo-Continental services and the outbreak of war, progress had been steady but not sensationally rapid. This also represents the position on the Continent, although most countries with land frontiers had naturally succeeded in opening telephone services at least with their immediate neighbours, so that Berlin, for example, could in 1914 speak to more foreign capitals than London could.

The War.—Position at the End of the War.

There followed the four war years. During this time, of course, no progress was made with the Anglo-Continental services—indeed, all the public services were suspended, although a number of new cables were laid across the Channel to France for military and administrative use. On the Continent there was, of course, a similar complete hold-up of all development except of temporary military lines—it is, however, worth noting that at least at one stage during the war German General Headquarters in Berlin could speak to Constantinople. After the Armistice, the pre-war services were gradually opened again to the public, and from the point of view of this country the position in 1919-20 was, therefore, that public service was only available to Paris, and to some towns in Northern France and Belgium. There was also a nominal and limited service to Switzerland. These services, of course, were far from representing the utmost that could be done, even had the technical limitations been the same as they were before the war. There is no doubt that, even had this been so, the arrears due to war difficulties would have been made up by progress at an increased rate. But, in fact, the technical position had entirely altered.

Post-war Progress.—Repeaters.

In the ten years since the war comparatively enormous strides have been made. The reasons for this, though of course of a technical order, have a fundamental bearing on the problem of administration. The small variations in electric current which carry telephone speech along a copper wire to its destination diminish in strength as they go on, so that normally the speech received is fainter than that transmitted. Moreover, the electric waves tend to become distorted in form as they go along, so that without special precautions the speech-sounds reproduced from them at the distant end may, even if loud enough, be unintelligible. The rate at which the strength of the received sound dies away depends primarily on the thickness of the copper wire, but is much more rapid in the case of underground or submarine cables than along an overhead circuit. Thick overhead copper wires are very heavy and expensive and this introduced a practical limiting factor as regards the development of long trunk telephone lines on land; on routes crossing the sea the length of the submarine cable was an even more important factor. The invention and development during and after the war of the thermionic valve, associated with the name of Dr. Fleming and now familiar to everybody with a valve broadcasting set, practically removed the limitation on the length of *land* lines; and the majority of trunk telephone lines between important centres are now contained in underground cables, each composed of many circuits of comparatively light copper wire. Along the cable routes are placed at regular intervals, about 50 miles in this country, repeater stations, at each of which the feeble incoming currents are magnified up again by means of a power plant and valves to their original strength. This invention, together with the development of special devices to cure electrical distortion, obviously opened up entirely new possibilities in the way of international European telephony. Reliable communication could now be had over almost unlimited distances on land. It is true that there was still a limit to the length of submarine cable over which speech was possible; but since this limit, even for multi-circuit cables, was over one hundred miles, the gap between the south and east coasts of England and the coasts of France, Belgium and Holland, and also that separating Scandinavia from Germany, had been or could be bridged, and there was therefore no technical obstacle in the way of providing a service between practically all the European countries.

Indeed, in the United States overland telephonic communication was already available over much longer distances than need be contemplated

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in Europe, and it was not long before the European business communities began to remind the telephone administrations of Europe that all was not as it should be on this side of the Atlantic.

Administrative Difficulties.

The immediate problem was to arrange the necessary close co-operation between the independent telephone authorities owning and controlling the telephone systems in the various European countries. A strong movement therefore made itself felt in Europe in favour of some kind of international combination to develop European telephony; and, in spite of the great practical difficulties on account of the strong feeling left by the war, in 1923 an informal advisory committee was formed, at first including representatives of the telephone administrations of the western countries only, to study the problem. In about a year's time it was possible to bring in Germany and to form a really representative advisory committee known as the International Consultative Committee, "C.C.I." for short. Incidentally, I believe the preliminary meeting in this connexion was the first, or practically the first, occasion after the war when official representatives of the formerly combatant powers on both sides, other than soldiers and diplomatists, met round a conference table. International co-operation in communications was, of course, no new thing; the Universal Postal Union and the International Telegraph Union, with their permanent secretariats and periodical congresses, furnished obvious examples of what could be done, but there were special difficulties in the case of international telephony. First of all, in order that speech shall be satisfactory over a long underground cable, it is necessary that the whole of the cable shall be designed at the outset for the purpose of long-distance communication. That is to say, it is not, in general, possible merely to hitch an underground cable circuit on to another not designed for the purpose. Moreover, modern underground telephone cables are extremely expensive. This meant that, as things were in 1924, before two distant terminal countries could arrange between themselves for a telephone service, they had to secure the co-operation of the transit countries in between, not merely to arrange terms for the use of existing lines on the transit countries' territory, but to persuade them to construct expensive new cables, in some cases solely for the purpose of affording transit communication. In cases where the transit traffic was not likely to be heavy enough to occupy or to pay for a whole cable the transit country might have to be induced to plan the design of a cable primarily intended for its own terminal international traffic or internal traffic in such a way that some of the wires could be employed as a link in the long "through" circuits required by its neighbours on either side to connect up with each other. To give a practical example, both Belgium and Holland have spent large sums of money in laying such plant, in part specially designed to carry Anglo-German telephone traffic. The standardisation necessary to secure this obviously involves a degree of continuous co-operation between the engineers of the various countries which could not be obtained without some permanent international machinery, such as the C.C.I.

There are also, of course, certain non-technical questions requiring general international co-operation—for instance, some degree of uniformity in operating procedure is essential if delay in handling calls and confusion on the part of telephonists and subscribers is to be avoided. This is much more the case with telephony than with other forms of communication, e.g., posts or telegraphs, or than with transport, because a telephone "message" is instantaneous and cannot be handled by passing it on from a set of people in one country (doing things one way) to another set in a different country (free to do the same things in quite a different way). In fact, each individual telephone call involves specific acts of simultaneous co-operation between at least four people, the subscribers at each end and two or more operators.

Recent Progress.—Scope and Quality of the Existing Services.

The C.C.I. made rapid progress in its task. It sketched out a rough plan of the international cables likely to be required in the next few years in Europe, laid down certain principles which it recommended the individual administrations to adopt in the design of these cables—so as to secure the degree of plant standardisation required at that stage; and left it to the individual administrations concerned to digest this good advice and to go ahead—which they duly did. In three or four years the whole position was completely altered. Instead of only a few capitals of adjacent countries being able to speak to each other, the large towns in Northern and Western Europe—that is, throughout an area bounded by East Prussia, Scandinavia, the British Isles, the Iberian Peninsula, Northern Italy and Hungary (inclusive of the countries named)—have now practically complete intercommunication, and progress to the south and east is going on steadily. For example, a sea cable across the mouth of the Gulf of Bothnia to Finland was laid this summer and will shortly bring that country into the general European system. Poland has recently placed contracts for the construction of a network of land cables with the necessary international connexions to the West. Italy has an extensive cable system partly completed and partly under construction; and progress is reported in Yugoslavia. Moreover, in many of these countries the internal plant system is good enough to allow free communication over the international network to practically all the towns and many villages—this is the case in both Great Britain and Germany, to quote only two important examples.

The remarkable leap forward which I have just illustrated has not been confined to the mere geographical scope of the European international services. The quality of these services, that is, their degree of freedom from imperfections, errors or delays, has correspondingly been improved almost out of recognition. Four or five years ago speech transmission from London to Paris or Switzerland, for example, was often very poor—people had to shout down the telephone to make their voice heard at the other end, and much time was wasted in repetitions of words or phrases which reached the distant telephone unrecognisably faint or distorted. This is entirely a thing of the past. Indeed, the loudness and clarity of speech between two European places has now no relation to the distance by which they are separated—when any transmission difficulty is exceptionally experienced, it is almost always found to be due to the condition of the local line or of the telephone itself; the efficiency of the latter is in fact becoming the governing factor in the problem of speech transmission, which, as regards the international circuits themselves, may thus be regarded as practically completely solved.

In regard to errors and delays, the number of the former which occur depends mainly on the operating efficiency of the internal telephone systems of the terminal countries and as this improves, errors are becoming rarer. The delays on the international lines, which are measured by the time which elapses from the moment when a foreign call is booked to the moment when it is put through, have been reduced on most of the main routes by 50%, or even by 70 or 80%. On those of the longer routes—say, over 500 miles—which were open 3 or 4 years ago, delays of 1½ or 2 hours on calls booked in the morning were an every-day occurrence, whereas on the much larger number of such routes open now a delay of one hour on an individual call would be quite exceptional.

It is naturally encouraging to the telephone administrations which have laid out large sums in providing modern line-plant in generous quantities in order to effect these improvements in the quality of speech and the speed of service, that the volume of international telephone traffic has responded in full proportion to the increase in the effective facilities provided for the public. I will only cite two examples. The number of conversations between England and Switzerland has increased from 15 a day in 1926 to 150 a day at the present time, and is still rapidly growing. The number of conversations between England and France has increased from about 1,000 a day as recently as the spring of this year, when the service was first completely modernised, to 1,500 a day, and is also rapidly growing.

From the point of view of this country, owing to its geographical position all its international telephone lines terminate in London, and once a foreign country has been provided with a suitable circuit or circuits to London, communication can be extended to the Provinces at once in practically every case over the modern system of underground cables which has been constructed in the last five years. Since the beginning of *this* year* service has been opened between this country and Czecho-Slovakia, Gibraltar, Hungary, North Italy, Luxemburg, Portugal, the Saare Territory and Spain. On the other hand, the sea crossing presents special difficulties, and, in fact, technical progress with submarine telephony is not yet so advanced as with land telephony, though rapid strides are being made. In both developments, British Post Office engineers have taken and are taking a leading part. The story of the scientific progress is extraordinarily interesting; but there would not be time to go into it now in detail even if I were qualified to do so.

(*To be continued.*)

* 1928.

DEATH OF A "ROYAL" TELEGRAPHIST.

THE death of Mr. W. J. Warmington in his 80th year on Jan. 2 last removes an almost historic figure from the Telegraph Service of these islands. The official history as recorded of Mr. Warmington would be covered by but few entries. Entered G. W. R., 1865, transferred to Post Office 1870, promoted Asst. Supt. Telegraphs 1898, Superintendent (Circulation) 1908, pensioned 1911.

Actually Mr. Warmington served for many of these years as Personal Telegraphist to King Edward at Sandringham. He was actually in charge of the special telegraphic arrangements during the illness and at the death of the lamented Duke of Clarence.

He married Miss Dyer (who pre-deceased him some years ago), formerly on the immediate personal staff of Queen Alexandra, who later stood as godmother to Miss Warmington.

Mr. Warmington was consequently well-known to all the Royal family and was always singled out by the late and present King and Queen and others when visiting the C.T.O., after his permanent return to that office.

It was a gracious thought, too, that prompted our present much-tried Queen to send a personal message of condolence to the bereaved daughter of our colleague. Mr. Warmington was born to the position, courtly, gracious at all times, and unperturbed by emergencies. He naturally came into intimate contact with many of the European monarchs, and one who was intimate with him states that his home is a small museum of souvenirs he has received from the crowned heads and other high dignitaries of Europe and the East.

J. J. T.

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Maintaining Strowger

Speed and Prec

The view below shows a section of A
Electric Inc.'s coil winding department
20,000 coils of various types are produ
day, to be used later in the construction o
units of Strowger Automatic telephone e

STROWGER

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utomatic Supremacy—

a Coil Winding.

THE coils used by Automatic Electric Inc. in the manufacture of Strowger Automatic telephone equipment are wound in its own factories under the constant supervision of experts thoroughly versed in every phase of this work. Automatic coil winding machines are used, which are operated by girls, who start the winding of each coil, place insulating wrappers between each layer of wire, stop the winding process at the proper point, and finally, before removing the coil from the machine, test the winding for proper resistance.

This modern coil winding equipment produces coils which are wound more evenly than can be done by hand, with the wire always applied under a constant predetermined tension. The coils, which form an important part of Strowger Automatic apparatus, are thus always insured of embodying the highest standards of quality, construction and performance, and of contributing their share to the general excellence for which this equipment is noted. The records of Strowger Automatic equipment in exchanges throughout the world for dependability and long life amply justify the extreme care which is taken at every step of its manufacture.

This is one of a series of advertisements illustrating the exacting care exercised in the production of Strowger Automatic telephone equipment, which is thus kept constantly in advance of the telephone art.

Automatic Electric Inc.

Factory and General Offices: 1033 W. Van Buren St., Chicago, U. S. A.

Sales and Service Offices in All Principal Cities

EXPORT DISTRIBUTORS

For Australasia -- Automatic Telephones, Ltd.
Elsewhere -- Automatic Electric Company, Ltd.

AUTOMATIC

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The
Telegraph and Telephone Journal.

PUBLISHED MONTHLY IN THE INTERESTS OF THE TELEGRAPH AND TELEPHONE SERVICE, UNDER THE PATRONAGE OF THE POSTMASTER-GENERAL.

Editing and Organising Committee - - - J. STUART JONES. W. D. SHARP. J. F. STIRLING. W. A. VALENTINE. J. W. WISSENDEN.

Managing Editor - - - W. H. GUNSTON.

NOTICES.

As the object of the JOURNAL *is the interchange of information on all subjects affecting the Telegraph and Telephone Service, the Managing Editor will be glad to consider contributions, and all communications together with photographs, diagrams, or other illustrations, should be addressed to him at the G.P.O. North, London, E.C.*1. *The Managing Editor will not be responsible for any manuscripts which he finds himself unable to use, but he will take the utmost care to return such manuscripts as promptly as possible. Photographs illustrating accepted articles will be returned if desired.*

VOL. XV. FEBRUARY, 1929. No. 167.

EUROPEAN AND AMERICAN TELEPHONE CONDITIONS.

THE views of overseas critics on telephone conditions in Europe are always interesting; they are sometimes instructive. We like to see ourselves as others see us, and to learn facts which had hitherto excaped our notice. Mr. W. H. O'Brien, for instance, writing in the Chicago journal, *Telephony*, on the subject of telephone conditions in Europe and the United States, says that it is particularly noticeable that in the great City of London most business establishments close entirely for the lunch hour! We can only remark that it must be flattering to the suburban grocer and chemist to find their businesses so described. Mr. O'Brien (who is Director of Telephone and Telegraph Utilities in Boston) intends this to illustrate his contention that business concerns generally in England are unprogressive, and that whereas in America "business follows the telephone," in this country the telephone follows slowly after business. This dictum sounds very well, but what does it signify? If it means that when Americans establish an exchange in a small town they provide spare plant for anticipated development, why, this is only the usual practice of all European administrations. If it means that in the United States exchanges are built before a demand exists for them, before a town has been canvassed for orders, in the optimistic hope that plenty of subscribers will come along in the future, this is somewhat contrary to our ideas of America's scientific planning of telephone development. If it means, as probably it does, that the chief American companies draw up schemes forecasting future development and provide plant accordingly, this again is the usual practice, at least in Great Britain. But we suspect the statement is merely a rhetorical flourish.

When we come to comparisons of rates and quality of service we encounter further surprises. The writer considers that Sweden and Holland rank first and second in Europe. Both of these countries have excellent telephone services, but as regards development Denmark is ahead of Sweden, and six European countries (including Great Britain) stand higher than Holland. The rates in Sweden, says Mr. O'Brien, are comparable with those in the United States. With what rates do the Swedish rates compare? With those in force in New York, Chicago, Boston, Oshkosh or Kalamazoo? American rates vary from a dollar and a half a month with unlimited calls in the small towns, to five dollars including 75 calls in the large cities. They exhibit in different parts of the country every variation and grade to which telephone tariffs are susceptible; they differ in kind and scope in almost every town. It is important that this point should be borne in mind when instituting such comparisons, for whilst European rates are graded in a limited number of standard groups for each country, the variety of American rates is endless, and each of the numerous operating countries has its own rate policy, differing generally in each town which it serves.

Our Boston critic comes to the conclusion that Europeans have as good service as they think they need. He is under a singular delusion if he imagines the psychology of European telephone subscribers to differ so strangely from that of Americans. Few subscribers in any part of the world believe their own system to be perfect; they naturally "think they need" the best that can be contrived. Patriotism may move them to vaunt publicly the telephone system of their native city or native land to strangers, but it does not prevent them, sometimes even in America, from casting a wistful eye on the real or alleged higher standards of service in other countries.

HIC ET UBIQUE.

WE have been asked by a reader for information on the subject of the installation of small motor generators to replace the present loop batteries for telegraph repeater working.

We may say that these have been in use, particularly in America, and by some cable companies, for a period ranging up to 20 years, and that the Post Office has had them in use in the Central Telegraph Office, London, for some 12 years. Their principal advantage is economy of space, as it can readily be understood that in a large office, or even where space is valuable, such as in the City of London, the use of these machines, occupying something less than a cubic foot of space, must be preferable to secondary cells which occupy shelf space depending on voltage requirements far in excess of that of small machines. The disadvantage of the machine is that someone should be in attendance during the whole period during which they are running, and this would be expensive for small installations, but not, of course, a heavy item where a number of machines is required. It is probable that the *Post Office Electrical Engineers' Journal* will give a detailed article shortly with a description of these machines, showing their construction and the methods of connecting them.

According to the official report of the Esthonian Posts and Telegraphs for the year ending March 31, 1928, 346,000 telegrams

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were dealt with during the year and upwards of 15 million telephone messages. The total number of telephone stations was 13,214, of which 4,126 were in Tallinu (Reval) and 1,196 in Tartu.

The Italian official report on telephone service as at June 30, 1928, shows that there were then 203,528 subscribers in Italy and 292,867 instruments. Of the latter, 113,087 were connected with the Piedmont-Lombardy Company's system, 72,156 with that of the Societa Telefonia Tirrena (Florence, Genoa, &c.), 33,758 with that of the Venetian Company, 31,309 with that of the Societa Esercizi Telefonici (Naples, Sicily), and 20,503 with that of the Media-Orientale (Rome, &c.).

The following incident, narrated by Mr. S. B. Gosling, Postmaster-General of the Gold Coast Government in his annual official report, gives an interesting picture of the benefit of the telephone to the illiterate native :—

The linking up with the telephone trunk service of a number of the smaller towns throughout the Colony has afforded great satisfaction to those communities.

One instance of this, which may be of interest, came to my notice during a tour of inspection when visiting a small town on the sea coast, the principal industry at which was the dried fish trade.

Soon after my arrival I was waited upon by a deputation of elderly women, who explained they represented those engaged in the dried fish trade, the ramifications of which extended to places in the far bush, even as far as Ashanti.

They were illiterate, and their trading arrangements with their agents at distant places had to be conducted through the medium of local letter writers, a system, I gathered, which frequently failed to safeguard their interests.

They informed me that they had heard that at some post offices a box was kept into which people could go and could then talk with those living in far places with whom they wished to trade. They expressed their earnest desire that such a box could be put up in their post office.

I granted their request and in due course the trunk telephone service was extended to the town.

On my next visit of inspection I found the telephone service had become the principal medium of conducting the up-country trade but the Postmaster complained that the loud voices of the women, when using the telephone, rendered ordinary business at the public counter very difficult and he had tried in vain to convince them that it was unnecessary to shout even when conversing with their client in the distant towns of Ashanti. The difficulty was overcome by transferring the telephone from the usual type of call box to a small room which also afforded greater space for the gesticulations which seem inseparable to the conversation of this class of user.

Reports continue to reach us of new overseas wireless telephone services. According to the Central News, wireless communication was established last month between Paris and Saigon, in French Indo-China. We understand that it was one-way transmission, there being no transmitting station in Saigon.

A gentleman, possibly of foreign antecedents, called recently at the Bournemouth Contract Office, when the following conversation took place :—

Prospective Subscriber : " Is thees vere I call as to a telephone ? " *Contract Officer* : " Yes, what can I do for you ? " *P.S.* : " Do you alvays keep to your advertisements ? " *C.O.* : " Yes, any we issue." *P.S.* : " Vell, I see a telephone is two and seex a veek and no charge to put in. Ees this correct ? " *C.O.* : " Yes, the rental in certain cases works out at that." *P.S.* : " Vell, I am here for two veeks but I shall only vant the telephone for von, or less than von veek, say seex days, but I am prepared to pay the full two and seex which I have here (producing same) if you will put it in at vonce, I do not want any rebate for the day I am short of the veek." (Collapse of the Contract Officer.)

THE LONDON AUTOMATIC SYSTEM.*

BY M. C. PINK, *Asst. Controller, London Telephone Service.*

(*Continued from page* 77).

FROM what I have said so far, it will be appreciated that the automatic portion of the London telephone system is now assuming considerable proportions. The patience and skill required on the part of the manufacturers and of the Engineer-in-Chief's Department in developing all the circuit requirements and supervising the erection and testing out of the apparatus will be obvious. A task of such magnitude could not be achieved without the occurrence in the early stages of many difficulties of an unforeseen character.

Apart, however, from the initial difficulties, it would, of course, be absurd to assume that a system of the complexity of the London Automatic System could possibly function without some measure of faulty working on the part of the apparatus concerned. In spite of the measures taken so far, I think it will be generally admitted that more has to be done in connexion with the matter of the results achieved with Tandem and C.C.I. equipment and in the reduction of errors arising in connexion with outgoing switching at the local exchanges. The types of errors vary at different exchanges, but the following statements show some of the difficulties experienced which lead to complaints from subscribers :—

The first gives instances of wrong displays on C.C.I. apparatus, with notes on their probable causes :—

Originating Exchange.	*Objective Exchange.*	*No. displayed.*	*No. required.*	*Remarks.*
Museum ...	Popesgrove	0887	1887	Loss of " positive " pulse.
Hampstead ...	" ...	0632	1632	" "
Burgh Heath	Sloane (manual).	1750	3332	Numerical equivalent for Sloane is 750. Partially set-up sender seized or ineffective cancellation after keying 1st numerical.
Not known ...	Sloane (manual).	8888	2504	Significant that combinations of like digits are used for routining. Other combinations occur, but not to the same extent.
Hop	Popesgrove	0000	1677	
Holborn ...	Chiswick ...	0000	3206	
Wallington ...	Lee Green	0000	1054	
Central ...	Popesgrove	8787	2251	Frequently, where the No. displayed bears no relationship to the No. required the former is constituted of digits 7 and 8.
Streatham ...	Popesgrove	8777	1497	
Avenue ...	Popesgrove	8877	1609	
Various Exchanges.	Paddington	8811	7740	Each digit preceded by an extra positive pulse. This particular case was the subject of repeated written complaints and is typical of pulse distortions.
Ealing ...	Sloane (manual)	1576	6576	The error in the first case represents a light negative instead of a heavy negative whilst the second illustrates the reverse condition. Many similar errors occur in practice.
Burgh Heath	" ...	7333	5333	
Clissold ...	Lee Green	3357	3571	Numerical digits misplaced by apparent interposition of an extra pulse between code and number. Probably a faulty pulsing condition.
Hampstead ...	Sloane (manual).	0307	3072	
Clerkenwell ...	Popesgrove	8936	1893	" Thousands " digit " lost," and remaining digits correspondingly misplaced. The agent responsible for supplying the units digit is not known.
Mitcham ...	Chiswick ...	8887	1888	
Avenue ...	Ilford ...	8394	0839	
Greenwich ...	Waterloo...	4428	1442	

I should, however, mention that at some exchanges it has been possible to effect a very material improvement in the operation of the C.C.I. equipments. An example is shown in Fig. 11, where it will be seen that at Lee Green the improvement for a period was very definite and the errors are now less than 5%. Figures of this sort emphasize the value of critical analyses of the results achieved in various directions in connexion with this complicated system.

The next statement shows examples of mis-routed calls. Mis-routing is a feature which is inclined to come in patches.

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* Paper read before the London Telephone and Telegraph Society.

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Exchange required.	*Exchange obtained and Number Displayed.*	*Translation of Exch. reqd.*	*Translation of Exch. obtained.*	*Numerical equiv. of Exch. reqd.*	*Numerical equiv. of Exch. obtained.*	*Remarks.*
RE 3331	E 3331	17	16	734	327	Apparent cutting-in prematurely.
HA 1674	EL 1674	529	539	427	358	Apparent over-stepping of 2nd code switch.
G 0655	ED0655	19	119	437	363	Additional impulse on translated side.
CC 3916	NX6391	116	311	254	639	Either (*a*) 1st code already stepped to level 3 or (*b*) director train of impulses preceded by redundant digit 3.
CW3072	RY0723	43	413	253	735	2nd Code apparently cut in on level 1.
C 9139	SM3691	13	112	236	787	1st and 2nd codes apparently operated each in position on level 1, switches responding direct to subscribers dialling.
RV 0079	PH8007	36	211	748	774	"A" digit selector apparently already in position on 7th level.
CC 5584	BA5584	116	15	254	228	Loss of pulse together with premature cutting-in on junction level.

A certain amount of trouble is caused in practice by switches cutting-in too soon, or by the transmission of extra impulses by the automatic plant The possibilities in this direction necessitate a close study of mis-routed traffic, and there is no doubt that a good deal can be done to ensure service improvement by the fullest co-operation and frankest interchange of views between the traffic and engineering staffs.

In this connexion it has to be realised that there is and will continue to be a traffic and operating staff of considerable magnitude associated with the system, and that the troubles experienced by the public must come to that staff and must be studied, analysed, and utilised for the purpose of identifying and removing the causes. With the large operating staff there is an elasticity of application which permits concentration where necessary on specific difficulties. In order that the service as a service may take the fullest possible advantage of this feature, any idea of taking sides must be thrown to the winds and co-operation must be used to the utmost. This point is appreciated by many officers, but I think there is considerable room for the development down the line of responsibility, of the sense of service and co-operation, and the realization of the necessity for a full appreciation of the subscriber's needs and rights as a customer.

The existence of the exchange staff facilitates materially the exercise of newly-installed automatic plant. This plant is tested out sectionally, but it only receives full test when calls are actually set up on the same basis as subscribers' calls. This can be done to a small extent by the engineering staff, but it can be done to a very much greater extent if the resources of the traffic staff are utilised. The principle of utilising these resources has been accepted, and it is now the recognised practice, before an exchange is brought into service, to pass over the equipment as many test calls as possible and to study the results of those test calls over a period of some weeks. There is no doubt in my mind that this utilisation of the plant, for what may be described as mass testing, is of very definite value.

Perhaps I may take this opportunity of saying one more word on a subject which has given rise to a considerable amount of discussion in connexion with the development of the automatic system, i.e. the question of subscribers' number changes. The process of changing over from manual to automatic service involves an enormous amount of disturbance to the public. The number of transfers from one exchange to another coinciding with the issue of the Directory in March next will probably be about 20,000 and the number for the following six months over 16,000. The good will of the public is influenced very much by the ability to retain the same number even if the exchange name is changed. In this respect London subscribers are not unique. I have just received my copy of the November number of the *New York Telephone Review*. This has an article on the same subject which says: "The company prefers, of course, to leave numbers unchanged wherever possible and the changes made are therefore the minimum consistent with the requirements." In this connexion the desirability of developing a type of final switch which can be used for any class of subscribers' service has been emphasized in the past, and I would again urge that this problem be regarded as a live one for which a solution should be found if at all possible.

With the adoption of the Automatic System our goal is the attainment at the earliest possible date of the maximum of automatic switching with a maximum of satisfaction to the public and the staff and a minimum of expenditure. Can we establish an efficient and economical automatic system? In considering these questions we have to take a very long view. There is no doubt that the automatic system entails increased capital expenditure on exchange and junction plant. Savings in buildings are problematical. The increased capital involves increased annual charges for interest and depreciation. The greater complexity of the plant involves increased charges in maintenance. These various charges must be met by the savings on operating staff. According to the last published Commercial Accounts relating to telephones, more than 66% of the annual revenue is already required to meet interest, depreciation, maintenance, and building charges. Administration and operating costs absorb only 27.65% of the revenue.

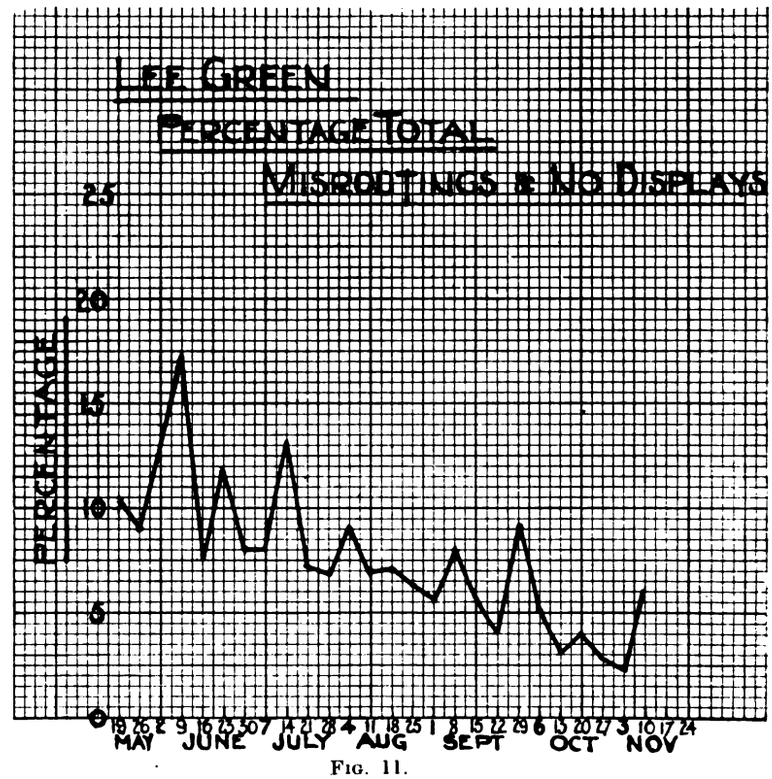

FIG. 11.

It is interesting to note that at an earlier stage in the development of automatics in New York the New York Company represented to the Federal States Commission the necessity for increased capital expenditure, and as a first step they were authorised to institute a surcharge on all accounts. In their main case before the Commission the Company claimed and obtained an increase of rates which would provide a return of 8% on the capital invested.

We can, I hope, carry our changes through without any increase in the rates, but I think it must be recognised that the chances of maintaining a considerable surplus under the new conditions will inevitably be reduced.

Apart, however, from the economics of the situation, it is necessary to consider the question of the ability to maintain staff provision, if we had continued a manual service.

Fig. 12 shows the number of girls born in the County of London each year from 1913 to date, and the number of girls who will consequently be attaining the age of 16 from 1929 onwards. The conditions during the past few years have increased enormously the demand for female labour, and many lines of competition for the services of girls of the age suitable for telephone work have been developed. There is a constant difficulty in maintaining a full supply of suitable recruits and it will be seen that if the pool from which the girls have to be drawn is reduced difficulties will increase. Although the condition will improve in 1936 it will be seen that in subsequent years the reduction in the number of available people will become very marked. If we were to continue to develop on a manual basis and the development followed well-established tendencies, the demand for operators would grow by leaps and bounds. As the automatic programme develops the demand will be modified and will remain more in conformity with the availability of people of the right age and qualifications.

Although it is clear that the demand under automatic conditions will be materially less than it would have been under manual conditions, it is most important to demonstrate the fact that it is most improbable that at any time recruitment will become unnecessary. The annual losses from the telephone staff on account of marriage, &c., are exceedingly heavy, and the staff would diminish rapidly year by year if it were not replenished by recruitment. It will be clear, therefore, that recruitment must continue and that continuity of employment is assured.

In connexion with the statistics showing the quality of service rendered on automatic exchanges, it may be of some interest to explain how this quality is measured. The outgoing service is watched from an observation desk provided for the time being at each exchange. At a later stage the observation work will be concentrated. In most cases the observation is

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taken on certain switches which are in common use. As a calling subscriber lifts his receiver and so becomes automatically associated with a switch under observation, the observer receives a lamp signal. She hears the dialling tone and as the subscriber dials his call the particulars are recorded on a tape machine. The observer then hears any tones that are connected, times the various stages and receives a lamp indication when the registration condition has been set up by the answer of the required subscriber. For some time after the opening of an exchange Service Inspectors make test calls from subscribers' premises and the results of all these tests are analysed and examined. In addition, each exchange is supplied with apparatus for taking local observations in cases where individual subscribers have criticised the service. As a check on incoming service results of public calls are observed daily at a large number of exchanges. These are tabulated and studied. In addition, in the earlier stages of an exchange a special observation set is provided which can be associated with any incoming position and its related junctions. This set gives a visual indication of the number keyed by the incoming operator and connects the observer automatically to the junction allotted for the particular call under observation.

In addition to the qualitative observation of service, we must know something of the quantities of traffic handled and its distribution. I have already quoted overall figures, but for the proper control of an exchange information must be gathered from all the various types of switches. In order to facilitate this meters are inserted at various points in the equipment. A list of the various types of meters in use is given below :—

Call Counting Meters.

One per Keysender B position.
One per group of junctions connected to a Keysender B position.
One per 10 (or 5) circuits from the auto-manual board to special 1st Numerical Selectors.
One per Director.
One per 10 (or 5) 1st Numerical Selectors on junctions incoming from auto-exchanges.

Congestion Sets (one "Congestion" meter and one "Traffic-Unit" meter.

Code Switch levels	1 set per grading.
1st and 2nd Numerical Selector levels	" " "
Subs. R.L.S.	" " "
"A" Digit Switch levels	" " "
Coder Finder	" " "
"A" Digit Switch Finders	" " "

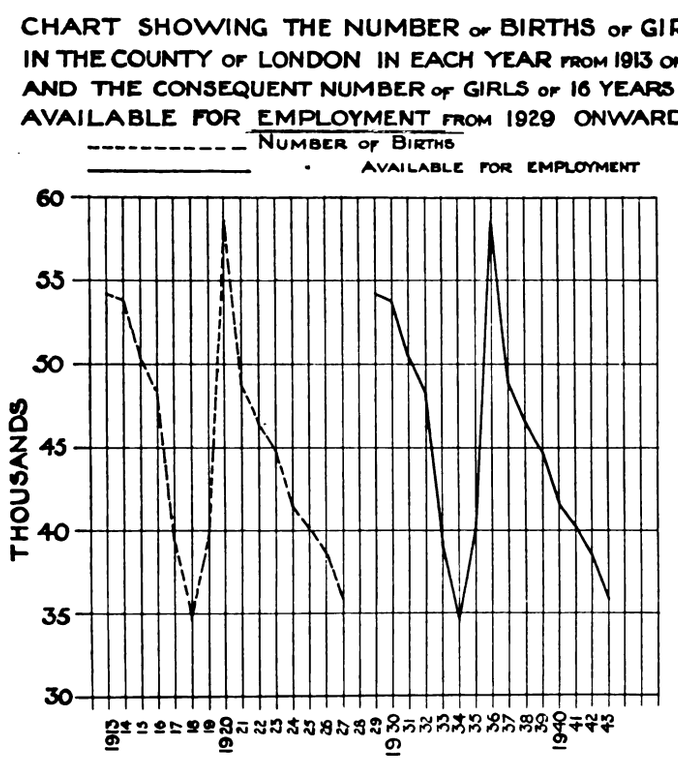

FIG. 12.

Overflow Meters.

Code Switch levels	1 meter per grading.
1st and 2nd Numerical Selector levels	" " "
"A" Digit Switch levels	" " "

Analysis Meters.

Code Switch levels	1 set of 12 for exchanges up to 3,000 lines ; 2 sets for exchanges above 5,000 lines.
1st and 2nd Numerical Selector levels	
"A" Digit Switch levels	

Points at which Metering facilities are provided by means of wiring to screw type terminals.

Coders	1 Terminal for Coder.
Keysender "B" Sender	" " Sender.
11th Contact on P.B.X. (11-20) Final Selector levels	" " level of 20 lines.
Group switches (1st, 2nd and 3rd code and 1st and 2nd Numericals) ... (Not at present provided but will be included in future equipment.)	" " 10 Selectors.
Busy Back contact on P.B.X. (over 20) Final Switches	" " PBX group.

In addition to the reading of these meters, regular counts are taken of the numbers of switches of various types in use at predetermined intervals.

The more one has to do with the automatic system the more one is struck by the absolute necessity for the fullest possible co-operation between the various types of mind associated with the problems. The need is emphasised by the size of the following programme of exchanges to be opened before the end of 1929. It will be seen that 15 exchanges have to be completed and that their combined ultimate capacity will be more than 100,000 lines :—

Exchange.	*Date of Opening.*	*No. of Lines to be Transferred.*	*Ultimate Capacity.*
Western ...	December, 1928 ...	2,500	8,100
Beckenham ...	February, 1929 ...	900	6,414
Archway ...	March, 1929 ...	1,740	5,288
Edgware ...	April, 1929 ...	550	4,000
Maida Vale ...	" ...	2,290	9,400
Temple Bar ...	" ...	1,200	9,400
Reliance ...	June, 1929 ...	1,100	4,092
Metropolitan ...	July, 1929 ...	1,400	9,400
National ...	"	1,300	9,400
Mitcham ...	"	680	2,852
Hendon ...	August, 1929 ...	1,800	4,000
Flaxman ...	" ...	2,800	9,400
Colindale ...	" ...	450	9,400
Fulham ...	September, 1929 ...	2,400	9,400
Hillside ...	" ...	500	6,120

In making this review of the London automatic system I have not refrained from calling attention to some of the difficulties which have to be overcome. At the same time I want to make it clear that enormous strides have been made in overcoming the initial difficulties experienced with the system. The latest exchanges opened are giving relatively little anxiety and there is no doubt that, while it is still necessary to work for the elimination or reduction of some of the miscellaneous difficulties, it has been established that a really satisfactory service can be provided for the public. If it is generally realised that every man and woman in the organisation may be capable of some contribution to the general well-being of the system as a whole and the subscribers associated with it ; and if we all have that spirit of "give and take" which must inevitably be associated with the point of view that there is one objective to aim at, one service to give, and one administration to supply that service, we shall find that we can achieve what we have many times set up as our goal for London—the best Telephone Service in the World.

In conclusion, I should like to express my grateful thanks tothe colleagues who have supplied me with material and prepared diagrams for this paper.

A CONTRACT MANAGER'S STRAY NOTES.

BY J. P. URWIN, LIVERPOOL.

TELEPHONE service saves innumerable subscribers more than the cost. Others do not find the service value for their money but find it convenient occasionally and pay for it grudgingly. Again, there are people who would like to have telephone service in their homes, as it would be convenient on occasion, and so useful in emergencies, but they cannot afford the charges.

Telephone authorities are always trying to make telephone charges as small as possible and the system of payment convenient.

There are reasons apparent to a few people apart from those employed in giving telephone service which make it prohibitive to have charges for telephone installations to cover free calls, or charges for telephone calls to cover free installations. Charges for telephone installations to cover free calls would be unfair to small users, as they would be paying for the large users' calls ; and charges for calls to cover free installations would be unfair to large users as they would be paying for the small users' installations.

Many matters must be taken into account in assessing the charges for telephone installations and calls.

A peculiarity of telephone service is that the cost of a large telephone exchange averaged over the number of lines connected is considerably higher than in the case of a small exchange, notwithstanding mass production and advantageous buying in large quantities. There is no escape from this,

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as communication between any two telephone users must be given by the operator without leaving her position and therefore *duplication* of apparatus for completing 'connexions' must be repeated as many times as additional operating positions become necessary.

From time to time, to equalise the work of the operators, it is necessary to record the incidence of the calls from each user and incur engineering expenditure for re-distributing their line terminations to operators' positions. This distribution of lines and the number of operators' positions varies according to the proportion of each class of user, classed according to the number of calls originated.

Another peculiarity of the telephone service is the need of provision of line wires and exchange buildings, neither more nor less than likely to be required, a considerable number of years in advance. Each user must have two wires from his telephone to the telephone exchange for his exclusive use; in other words, a "main" all to himself instead of being served from a main serving all other users as in the case of gas, water and electric lighting. The line wires are laid from the exchange years in advance and branched in various directions where people are likely to become users, allowance being made for the drift or "course" of movement and expansion of the various business and residence centres.

A matter of growing importance is the increasing proportion of residences and small shops with telephones where few calls are "originated." This increasing proportion of small users lowers the average number of "originating" calls per subscriber and therefore the telephone authorities are faced with a falling average revenue per line!

A considerable number of people would like to have telephones in their homes, who would originate, perhaps, only about 100 calls or so in a year, Civil servants among them, and in time these will adopt telephones.

A small average number of "originating" calls per line enables more lines to be dealt with at an operating position than lines with a large average number of calls.

While the revenue *per line* falls, perhaps the gross revenue *per operating position* will increase and co-incidentally, relatively less switchboard apparatus, accommodation and fewer operators will be necessary as the switchboard apparatus for connecting one line with another will be less than for large users.

Can the charges for telephones and calls be reduced in view of the falling average revenue per line? Would a reduction increase revenue in the gross in ratio to the cost of giving service?

Telephone authorities are always seeking to avoid unnecessary capital expenditure; to reduce maintenance, "operating" and working expenses generally; and to encourage the use of the telephone service.

General matters of deep concern are the character and density of the various parts of the country, the conditions in industry and commerce and the present-day conditions of life of the individual. The country is passing through days of transitions; the character and density of places are altering to the good, at the expense of other places; migration is considerable; individuals are caught in the vast and rapid changes and are living up to income.

A natural result of the quick-changing conditions now-a-days is the increasing number of telephones to be provided and recovered for each hundred net increase. This involves capital expenditure for a considerable margin of line wires on which depreciation and interest on capital accrue without a direct return of revenue or, alternatively, high costs of providing individual lines.

Ways and means of accelerating the development of telephone traffic:—

Advertisements humorously illustrated in newspapers, periodicals, cinemas and public places, showing the use of the telephone in various circumstances.

System of payments to meet the present-day conditions of life of the individual: coupons for monthly payment of subscription.

The volume of telephone traffic would be increased by making street telephones available wherever something comes to the mind about which it is desired to speak to another person, and by reducing the charges for calls to the level of subscribers.

Availability of street telephones which would enable subscribers to get in touch with their own places of business or homes at all times, *without going out of their way*, would enhance the value of their own installations.

Some people look upon monthly payments as being *infra dig.*; therefore, monthly payments for the telephone should be given the mark of respectability by being made general. Those subscribers who do not wish to be bothered with monthly payments might be allowed to present a number of rental coupons at a time, with one payment, for any period not exceeding twelve months.

Monthly payments are easier to pay out of income; they would place the telephone service within the reach of thousands who find it inconvenient to pay a large sum but pay monthly at a slightly greater cost for furniture, motor cars, &c., &c. They would cause existing telephone plant to be brought into use quickly and increase revenue considerably.

It might be reasonable to assume that every "business" telephone subscriber can afford to have a "residence" telephone and has one, but it is a surprising fact that the number of "residence" subscribers in the United Kingdom would be about 77% more than the present number if the number of business and residence subscribers were "fifty-fifty."

A 77% addition to the number of residence subscribers gives a remarkable figure, and if all officials and better-paid employees should be regarded as potential subscribers in addition to the employer, there is tremendous scope for telephone development in private residences apart from those occupied by people of independent means or living in retirement.

As a result of intensive telephone development in private houses, shopkeepers would require additional lines for incoming calls and few would remain without lines. This in turn would cause wholesale concerns to require more lines for incoming calls.

If telephones with a system of monthly payment were firmly established as part and parcel of the make-up of the average home the psychological effect would be that the percentage of users who wished to discontinue them would be reduced to the minimum.

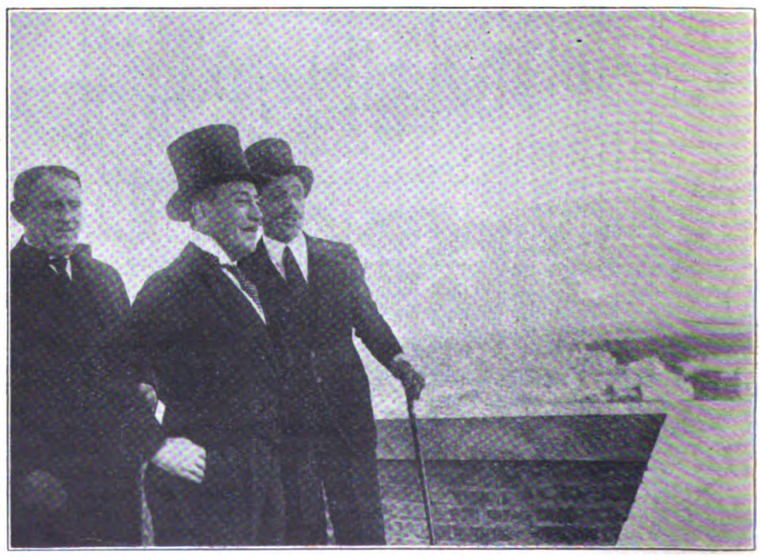
Intensive telephone development would increase employment considerably in the many branches of work and trades affected: (Cables) lead, copper, paper, cotton; (telephone and exchange apparatus) timber, brass, iron, copper, silk, rubber, accumulators, conduits, insulators, bricks, manhole covers, excavating, machine tools, transport, lighting, coal, &c.

In certain telephone exchanges, possibly, there would be less switchboard apparatus for completing connexions (if not fewer operators) if the small users' lines were segregated and joined to a separate switchboard instead of a switchboard serving large users. Such an arrangement would involve other expenditure which might be worth while incurring.

OPENING OF TRANSATLANTIC TELEPHONE SERVICE BETWEEN SPAIN AND U.S.A.

INAUGURATION BY THE KING OF SPAIN OF SPANISH-AMERICAN TELEPHONE SERVICE (VIA LONDON) AT MADRID.

Seated: (1) American Ambassador, (2) Minister of Communications, (3) Minister of Interior, (4) King Alfonso, (5) Papal Nuncio, (6) ——, (7) Marques de Urquijo, (8) Mr. Sosthenes Behn.



KING ALFONSO, MARQUES DE URQUIJO (President of National Telephone Co. of Spain) and Mr. PROCTOR (Vice-President), looking at panorama of Madrid from the roof of the Telephone Company's new building.

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GLASGOW TELEPHONE NOTES.

THE Douglas Exchange Staff Christmas Dinner was celebrated on Dec. 20, 1928. As in former years the "fare" was first class and plenty of it! A special word of thanks and appreciation is due to those members of the staff who rendered such practical voluntary assistance in the kitchen itself and in the decoration of the dining room. The whole arrangement was such that many of us felt that we would not mind Christmas coming more frequently, but the digestive apparatus would assuredly need tuning up!

Robert Thomson is young, full of ambition and has for some time past been attached to the District Manager's Office, wherein he played the useful, if not spectacular, role of boy messenger. On his removal—at the end of 1928—to other spheres of labour we just clubbed up and gave him a gold watch, suitably inscribed, as a mark of the esteem he had won all for himself, and a tangible reminder of his brief but, we trust, happy association with "Telephones Glasgow."

We delight in making and breaking records in this district. Unofficially, of course, but nevertheless true, we have just beaten our previous best in regard to staff meetings.

Just before Christmas last there was a memorable meeting at Telephone Headquarters (Glasgow) at which it was announced by the Chairman, Mr. A. E. Coombs, that, including the said meeting, every available member of the Glasgow District staff had been met in conference and general discussion. The gatherings included the most recently appointed juniors of any and every grade, and the highest executive and administrative officers. A few figures as to the attendances of members of the various grades will perhaps be of interest:—

Administrative and executive	236
Supervising	72
Operating (day, 650, night 101)	751
Clerical	79
Contract	20
Total ...	1,158

In all 68 meetings were held!

Is it worth while? In the opinion of the writer there is only one answer which can no doubt be guessed when he expresses the sincere hope that the procedure will become a permanent and annual part of our organisation!

The "Flu" germ has been exceptionally busy during the past month. Early in the year Glasgow was visited by severe cold and heavy fogs which took their due toll. In the middle of the month, for example, the sick leave of the exchange staffs rose to 141, as against a normal figure of about 27. The average sick absence for one week of the month amounted to 123 officers. Other sections of the staff were affected also, though not to so great a degree. Unfortunately, and to our sorrow, two officers "passed over"—Miss H. McG. Jackson, telephonist, Trunks, and Miss L. A. Brough, Assistant Supervisor, Douglas—to whose sorrowing relatives we extend our sincere sympathy.

We cannot speak too highly of the wonderful response of the staff to the exceptional conditions and the special demands made upon them. They caught the 1914-1918 spirit again and put their shoulders to the telephone wheel. Those in the service will readily appreciate all that this means.

On Promotion.

"I was last week taking a solitary walk in the gardens of Lincoln's Inn when, according to the nature of men in years who have made but little progress in the advancement of their fortune or their fame, I was repining at the sudden rise of many persons who are my juniors. As soon as I recovered my usual temper and serenity of soul, I retired to my lodging and, falling into sleep, I dreamed a dream, or saw a vision. Methought I saw that sign in the heavens which is called by the name of Balance; at length I perceived the Goddess of Justice. . . . A voice was heard from the clouds declaring the intention of this visit, which was to restore and appropriate to every one living what was his due. . . . One edict pronounced 'That all the posts of dignity and honour should be conferred on persons of the greatest merit, abilities and perfection.' . . . All were surprised to see so many new faces in the most eminent dignities; and for my own part, I was very well pleased to see that all my friends either kept their present posts, or were advanced to higher."—*Tatler*, of Nov. 29, 1709.

"Promotion by merit is not at all the same thing as promotion by ability. Clever men mostly forget this. Nothing is so embarrassing as unsuitable ability. The eleventh-hour man is absolutely essential to the service. It is the highest self-discipline to receive the brilliant new-comer without resentment. Exceptionable ability must not be required to graduate. Hostility to youth is the worst vice of the middle-aged. It is silly to quarrel with the chamois because he has not come by the mule path. It is a cheap generosity which promises the future in compensation for the present. . . . It is the greatest folly to seek a position to which your abilities are unequal."—"Bagehot."

"'Then there is nothing left for me to do, but to acknowledge myself an ass.' 'No, Squirrel,' said M. Lecoq kindly, 'you are not an ass. You merely did wrong in undertaking a task beyond your capacity. Have you progressed one step since you started in this affair? No! That shows that, although you are incomparable as a lieutenant, you do not possess the qualities of a general. I am going to present you with an aphorism: A man can shine in the second rank who would be totally eclipsed in the first.'"—E. Gaboriau.

The curious may like to look up the following additional references:—

A. Kempis, "Imitation," 22/3; Psalm 37/35 (Prayer Book version); Judges, 9/8-15.

LONDON ENGINEERING DISTRICT NOTES.

Retirements.—Mr. H. F. A. Wenman retired from the service on Nov. 30 last after a varied and interesting career extending over 42 years. Mr. Wenman served in the K Company, Royal Engineers, for several years, after which he was appointed telegraphist in Liverpool. Subsequently, he became Junior Clerk, Sub-Engineer, Second-class Engineer and Assistant Engineer. Mr. Wenman was General Secretary of the Society of Post Office Engineers for over 6 years, and in that capacity he rendered splendid service to his colleagues. At the recent conference of the Society of Post Office Engineers, opportunity was taken to present Mr. Wenman with a token of the high regard in which he is held by his friends and colleagues.

Mr. A. C. Greening has also retired after 45 years' service. Mr. Greening commenced his career as an operator in 1883, and ultimately became an Assistant Engineer, which position he held for many years. At a farewell gathering opportunity was taken by many present to pay eloquent tribute to Mr. Greening's sterling qualities. These remarks found concrete expression in a suitable gift which was presented by Mr. Ridd to Mr. Greening on behalf of his colleagues and friends. Mr. Edgerton, Sectional Engineer, occupied the chair.

Mr. J. H. Stewart, Assistant Engineer, N.W. Internal Section, London District, retired on Dec. 31, 1928, having attained the age of 60 years. A valued member of the National Telephone Company's staff, Mr. Stewart was appointed an Assistant Engineer on his transfer to the Post Office Engineering Depot. He served almost continuously in the West and North-West District of London, and the respect and affection in which he was held by the Section Staff was expressed very fittingly by representatives of all ranks on the occasion of the presentation of a parting gift.

Exchange Construction.—The following exchanges have recently been opened:—

Exchange.	*Type.*	*Date.*
Molesey	C.B. Manual	Jan. 2, 1929.
Hornchurch ...	C.B. Manual	Jan. 3, 1929.
Western	Automatic (Siemens) ...	Jan. 5, 1929.
Sutton	C.B. Manual	Jan. 9, 1929.

The opening of Western constitutes another step in the conversion of London Telephone System from manual to machine switching. The Western Exchange is the first automatic equipment of the Director type to be provided by Messrs. Siemens in the London area. The satisfactory changing of this exchange on Jan. 5 was a notable achievement, having in mind the disastrous effect of the Holborn explosion upon the associated junction routes.

The automatic exchanges now working in the 10-mile area are as follows:—Tandem, Holborn, Bishopsgate, Bermondsey, Monument (Mansion House Hypothetical), Sloane, Welbeck and Western.

At the opening of the Sutton Exchange, members and officials of the Sutton Urban District Council were present and took a great interest in the proceedings. It was gratifying to hear a councillor of many years' standing pay tribute to the unfailing courtesy and the prompt attention which, as a telephone subscriber, he had always received.

Holborn Explosion.—The disastrous explosion which took place in Holborn on Dec. 20 last destroyed a main telephone route comprising 26 large cables. These cables, which carried over 4,000 working trunk and junction services, were carried in a cast-iron tube previously acquired by the Post Office.

With great regret it is necessary to record that Mr. P. G. Thrower was so seriously injured that he died subsequently. Considering the magnitude of the explosion, it is astonishing that personal injuries were not more numerous. The disaster occurred in the early morning, and the provision of alternative routes for the circuits was undertaken immediately. By the next day, about 60% of the working trunk circuits had been replaced by wires on other routes, and by Dec. 30 practically the whole of these circuits had been so replaced. The restoration of the junction circuits was more difficult, both on account of their number and the limited number of alternative routes. By Dec. 24 about 50% of the working circuits had been diverted and simultaneously cables were being drawn in via a by-pass to bridge the damaged portion, which extended for about half a mile. Approximately 75% of the circuits were restored by Dec. 31, and the balance by Jan. 8.

This result was only made possible by the sustained efforts of the external and internal staffs in the performance of practically continuous duties during what would otherwise have been for them the festive season.

The work of drawing out the damaged cables and replacing the tube by ducts is now in hand.

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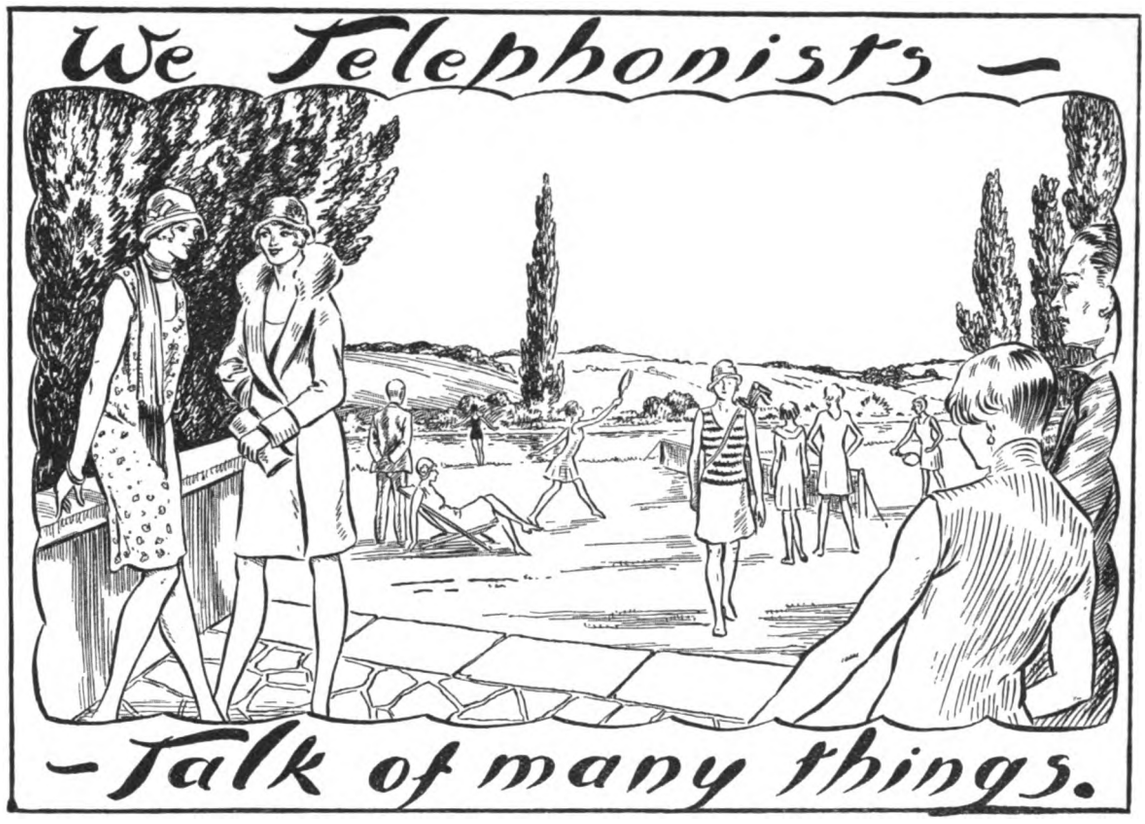

Musing.

DIRECTLY he stepped upon the platform I knew that he was a grocer—but perhaps I had better start at the beginning. I went to a meeting recently at which the speaker was a grocer. Mind you, I do not *know* that he was a grocer but, if he was not, he must have been a grievous misfit in whatever other calling he pursued. He looked and spoke like a grocer and he was shaped like one. His general bearing was that of a grocer, and it was only the absence of a white apron about his waist that suggested he was off duty.

I felt an unreasonable degree of irritation at the thought of being addressed by a grocer, and I remembered with satisfaction those lines of Chesterton's :—

> God made the wicked grocer
> For a mystery and a sign
> That men might shun the awful shops
> And go to inns to dine.

The words afforded me some measure of relief and I became more tolerant but even less attentive. Whilst he spoke I mused and I felt that the longer he talked the longer I should be able to muse in comfort.

Have you ever considered what an advantage it is to be able to go to meetings. Life does not offer many opportunities for musing. One cannot muse on holiday, for a holiday is a serious affair during which one must see all that can be seen, do all that should be done, and indeed live every minute of it as though it were the last. One cannot muse at length in bed or in the bath because of the soporific effect of beds, baths and musing. One cannot muse in the home. If one sits there silent and thoughtful, an unsympathetic family attributes the mood to laziness, the sulks or indigestion. Moreover, the most beauteous moments of the muse are harshly interrupted by "Tea's ready," or "Stoke up the fire," or "Let the cat in." One may not even muse after midnight because of the sleepy and oft-repeated injunction, "Oh, do come to bed." But at a meeting—and, be it whispered, even during a sermon—one may muse without hindrance. The fixed expression, the other-worldly look, the apparent oblivion to surroundings are interpreted as signs of keen interest and absorption in the matter of the moment—one appears to be lapping up the stream of words and satisfying the thirst of the mind or soul. And so, being free from mundane interruption, one can muse for as long as the speaker can speak.

So I mused upon the grocer and on grocers and tradesmen in general. After all, there was no reason why I should not be lectured by a grocer. Were not grocers in bulk quite estimable people—preferable, indeed, to many other tradesmen ? Was there not a simple dignity about them and a separateness from all the commoner forms of trade ? Their calling might almost be regarded as a profession. Their very name was unique and exclusive, and neither the name nor the calling suffered because the men who sell cabbages had aped greatness and had called themselves *green*-grocers. Their conduct in business, I reflected, was genteel. They did not blare their wares from the outside of their shops, like butchers. Their windows were tasteful displays of "sugar and spice and all things that are nice," and not garish exhibitions of the coarser kinds of food. The grocer did not call the matron "Ma," and he used clean white string and pleasant brown paper for his neat parcels.

Furthermore, I thought, what can convey a better notion of the commerce of nations than the interior of a grocer's shop. Look where you will and there is something to remind you of a far-flung empire, of distant climes, of the ocean and ships, of blue skies and blazing sun, of palms and rice fields, of strange people and tongues. One would half expect a grocer to be able to read Chinese and to sleep with a Union Jack for an eiderdown. At any moment a tea chest might open and reveal a Confucius. No shop, I considered, had such a divine scent as that of a grocer's shop—it wafts adventure and recalls those spacious days by the quiet fireside when the Romance of the East seized our childish imagination.

* * * *

I was roused to realisation by the cessation of the speaker's voice. Just what he had been saying I do not know. Possibly a grocer will never speak to me again. Who can tell what I missed ! But for whatever cause the collection was made that evening, I felt somehow that my mite was not wasted.

PERCY FLAGE.

Gerrard.

On Dec. 21 the Gerrard Swimming Club held their Annual Christmas Party.

The evening proved a great success and both Operating and Engineering staffs were well represented. We were honoured with a visit from the Reverend and Mrs. Patrick McCormick, who assisted in judging the fancy dresses. This was rather a difficult problem owing to the medley of costumes. Prizes were awarded to Miss Ormond as a captivating messenger boy, Miss Hooper attired as a Persian Princess, Miss Clover as Topsy of "Topsy and Eva" fame, and last, but not least, Miss Morris as Queen of Hearts.

Mr. E. A. Pounds, our District Superintendent, kindly acted as M.C. Mr. Keatley, as usual, provided excellent dance music, and we were further entertained with a solo dance and male impersonation by Miss Rudd.

Altogether we spent a very jolly evening and our only regret is that Christmas comes but once a year.

E. L. E. S.

London Telephonists' Society.

On Friday evening, Feb. the first, all those who have an urgent thirst for dabbling in psychology or "inhibitions" yearn to see, will have a pleasure rare indeed, for on that evening Captain Reid will lecture to us once again, just as before, in language plain. Much information we shall glean of what

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our "hidden urges" mean, of what we can't, and can, endure, and many other points obscure. But first we'll meet, as is our rule, for tea inside the vastibule, at 6 p.m., then one and all will rush to gain the Lecture Hall.

Please keep that Friday night in view, and try to bring a friend with you.

Ode to Western.

Oh, welcome in new Western
To join the auto throng;
Our toll of marker pilots
Will now be hundreds strong.

Your sisters, Sloan and Holborn,
Both greet you with a smile,
And trust there'll be no wrong displays
Or trouble with your dial.

Your little cousin, Tandem,
Will key out WES for you,
If ringing tone rings out O K
Your calls should all go through.

And Monument and Mansion-House,
Our hypothetic pair,
Combined with Auntie Bermondsey,
Will auto laurels share. D. D.

Contributions to this column should be addressed: THE EDITRESS, "Talk of Many Things," *Telegraph and Telephone Journal*, Secretary's Office, G.P.O. (North), London, E.C.1.

MANCHESTER NOTES.

(1) *Progress.*—The number of stations in the Manchester district at the end of December was 87,666, an increase of 4,973 on the December, 1927, figure. Trunks and telegrams dealt with were 6,482,134 for the year, an increase of 264,000 over the previous year, whilst local calls for the 12 months ended Sept. 30 (the latest figure available) numbered no less than 66,000,000, an increase of 5,000,000 calls. 133 street kiosks have also been installed during the 12 months, making a total of 380 now in use. The card system for showing particulars of installations has been introduced in place of rental registers in respect of four hypothetical exchanges, and its extension to the rest of the district will take place during the current year.

(2) *Staff Lectures.*—The series of lectures relating to automatic telephony which is being given by Mr. J. L. Parry to the Manchester Supervising Officers continues to attract large attendances. On the afternoon of Saturday, Dec. 8, the lectures were supplemented by a visit to the new Rochdale Automatic Exchange, where the installation was thoroughly examined. The party was nearly 40 strong, and the North-Western Traffic Staff, assisted by representatives of the Engineering Department, went to a great deal of trouble to make the visit a success. The visitors hope to return the compliment when Manchester's system is in a condition for inspection.

(3) *Social Events.*—The staff of the Manchester Central and City Exchanges celebrated Christmas with customary thoroughness, notwithstanding the heavy season traffic. On the evening of Dec. 19 a lively social evening was held in the Rest Room at York Street. Miss A. Wright and Miss K. Frost presided. The District Manager, Mr. J. T. Whitelaw, the Traffic Superintendent, Mr. J. L. Parry, Messrs. A. Kemp and F. Williams, Exchange Superintendents, were privileged guests. These gentlemen were the only representatives of the "weaker" sex—the ladies numbered nearly 300—but your correspondent is informed that they stood the strain very well.

The proceedings opened with the Week's Good Cause broadcast by Miss G. Laing, who made a touching appeal on behalf of the Society for the Suppression of Satirical Subscribers. At the outset there was a little trouble with the microphone, but everything went smoothly when this had been overcome. A number of clever artists presented an attractive programme of musical items, monologues and speciality dancing. A one-act Comedy Sketch, in which the majority of the characters were males impersonated by operators, brought the audience to tears (of laughter). Dancing, community singing, and refreshments, the latter at the capable hands of Misses Gregson, Finch, Smith and Mrs. Cartwright, completed the evening's diversion.

It has for many years been the custom of the staff in Central and City Exchanges to send supplies of dolls, dressed by members of the staff, and toys, to the Children's Hospital and the Ragged Schools at Christmas. This year's supplies were duly despatched on Dec. 20.

On Dec. 20 the District Manager's Staff held their Annual Christmas Dinner, at which about 90 of the staff were present. Mr. J. T. Whitelaw, District Manager, took the chair.

After dinner, all repaired to the room set aside for dancing, where an excellent Dance Band was in attendance. In the intervals between the dances Miss N. Phillips, Mr. J. M. Phillips and Mr. J. Brooke gave selections from their varied repertoires. Community singing was also indulged in, the Contract Officers forming themselves into an impromptu "choir" to give the lead in the rollicking choruses.

(4) *Retirement.*—On Dec. 31 we bade farewell to Mr. S. Johnson, and on Jan. 1 Mr. T. Hibbert terminated his services with the Department on attaining the age limit. Each of these Clerical Officers was an old National Telephone Company man and had served for 34 and 46 years respectively.

Mr. Johnson will be remembered by his colleagues who served with him in the following districts: Warrington, Barrow, Preston and Blackburn. He was subsequently transferred to Manchester about 9 years ago. Mr. Hibbert ("Tim"), however, spent the whole of his official life at Manchester and will be known to many of the old Lancashire and Cheshire and ex-National Telephone Company staff now serving in other parts of the country. "Tim" was, I believe, the oldest ex-National Telephone Company man in the Manchester district, and I doubt if there is anyone senior in point of service in the country. The official farewell was staged in the Dining Room on the dates mentioned above, when a goodly and representative company were present.

PROGRESS OF THE TELEPHONE SYSTEM.

THE total number of telephone stations working at Nov. 30, 1927, was 1,709,875, representing an increase of 13,670 on the total at the end of the previous month.

The growth for the month is summarised below:—

	London.	*Provinces.*
Telephone Stations—		
Total at Nov. 30	609,098	1,100,777
Net increase for month	6,052	7,618
Residence Rate Subscribers—		
Total	143,507	227,119
Net increase	1,862	2,449
Call Office Stations (including Kiosks)—		
Total	5,483	19,904
Net increase	33	104
Kiosks—		
Total	1,191	4,731
Net increase	33	99
Rural Party Line Stations—		
Total	—	10,347
Net increase	—	54
Rural Railway Stations connected with Exchange System—		
Total	—	1,016
Net increase	—	7

The number of inland trunk calls dealt with during September, 1928, was 8,860,088, an average of 354,404 calls per day. During the six months ended Sept. 30, the number dealt with was 54,631,310, representing an increase of 3,591,164, or 7.04% over the corresponding period of 1927.

Outgoing international calls in September numbered 34,518 and incoming international calls 37,404. In the six months ended September, 1928, 207,855 outgoing and 229,511 incoming calls were dealt with, representing increases of 52,702 (34.0%) and 63,447 (38.2%) respectively over the corresponding half-year of 1927.

Further progress was made during the month of December with the development of the local exchange system. New Exchanges opened included the following:—

LONDON—Welbeck (automatic).

PROVINCES—Bishops Stortford, Harpenden, Heckmondwike, Hipperholme (automatic), Sowerby Bridge (automatic),

and among the more important exchanges extended were:—

LONDON—Tottenham.

PROVINCES—Anfield, Bolton, Byfleet, Cradley Heath, Gravesend, Maidstone, Runcorn, St. Annes-on-Sea.

During the month the following additions to the main underground system were completed and brought into use:—

Rochdale—Halifax cable,
Bolton—Wigan cable,

while 89 new overhead trunk circuits were completed, and 97 additional circuits were provided by means of spare wires in underground cables.

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LONDON TELEPHONE SERVICE NOTES.

Contract Branch Notes.

THE business done by the Contract Branch during the month of December resulted in a net gain of 2,404 stations, as compared with 2,770 last year. This decrease was entirely in the West End, and it is thought that it is mainly due to a reduction in trade due to the decrease in social and other activities owing to the King's illness.

It is interesting to note, however, that the net gain for the December quarter amounted to 15,055 stations, as compared with 13,989 last year.

There were at the end of 1928, 1,214 kiosks in London. The increase during the year was 459. There has been no rush on the part of any authority to offer sites for this public facility. On the contrary, practically every site has had to be fought for, and it has been estimated that out of every four sites considered, only one matures. In the circumstances, we might have done much worse.

The excellent little model of a No. 2 kiosk used as a biscuit box, introduced this Christmas by the C.W.S., has excited considerable interest. It is hoped that there may be a wide distribution of these models, as anything which draws attention to the real article is not to be despised, even if in the humble guise of a receptacle for the toothsome biscuit.

It is with deep regret that we have to record the death of our late colleague, Mr. F. H. Jonghmans, formerly of the City Contract Office. Mr. Jonghmans was superannuated as recently as Nov. 17 last, and died on Dec. 21. He was buried at Streatham Park Cemetery on Dec. 27, the Contract Branch being represented at the funeral by Messrs. A. E. Culpin and A. G. Mansell.

* * * *

National Sanatorium, Benenden.

The second of the series of concerts organised by the staff of the London Telephone Service was held at the Sanatorium on Dec. 29.

The artistes were: Misses Nellie Beare, Margaret Worth and Mollie Aldridge and Messrs. Arthur Hemsley, Bob Douglas, John Harris and Hugh Williams, the concert being under the direction of Miss Worth. Again the staff, patients and artistes thoroughly enjoyed themselves.

The inclusion of Miss Nellie Beare and Mr. Hemsley in the concert party was a considerable advantage, as it enabled such popular items as the quartette "A Regular Royal Queen," "The Miserere Scene" from "Il Trovatore" and the duett "Tenor and Baritone" to be included in the programme.

At the close of the concert the staff expressed their appreciation of the further kindness of the L.T.S. in providing such an excellent entertainment and Miss Worth, in responding, announced that another concert would be given on Jan. 26, 1929.

* * * *

A "Send-off" Party at Gerrard.

To mark the retirement of Miss G. Snook on Jan. 11, the Supervisors and staff organised an evening party which was attended by about 300 of her friends and colleagues.

MISS G. SNOOK.

During the afternoon Miss Snook was presented with many beautiful and useful gifts from personal friends. She also entertained to tea several who were anxious to do her honour but were unable to avail themselves of the evening's entertainment. We were honoured by the attendance of the Superintendent, F. E. S., Miss Cox, and a number of Superintendents of Traffic, including many old friends of ex-National days.

Mr. Pounds, when handing Miss Snook a cheque for £28, given by her friends throughout the London Telephone Service, commented on the large attendance of the younger members of our staff, and said "she deserves it all because she has made friends wherever she went." A bouquet of flowers was then presented and this was followed by a hearty rendering of "She's a jolly good fellow" and "Auld Lang Syne."

The Misses Longman, Cleave, Gardner, Latimer and Southon provided the musical side of the entertainment; the latter associating with her song, "Good Luck," a beautiful bunch of white heather for Miss Snook.

There was unusual excitement in the neighbourhood when a large party of Miss Snook's friends gathered round her taxi in Gerrard Street. The police moved the car on before the good-byes were said, leaving half of her belongings on the pavement. However, this was soon rectified and the chorus of hooters from neighbouring cars was successfully drowned by our young folks' voices speeding the parting guest.

We hope to see Miss Snook among us on many future occasions. For the time being we have lost a good friend and loyal colleague. Here's to her happy retirement and, once more, "Good Luck."

Miss Snook wishes to thank all her friends for their share in her testimonial and for the charming personal gifts presented to her on her retirement. She also desires to say that the presence of so many old friends and colleagues was a surprise and delight to her. To use her own expression: "It was the happiest day of my life and I enjoyed every minute of it."

* * * *

Football Notes.

The month of December was a bad one for the L.T.S. football team, as both league matches were lost, in addition to the Challenge Cup tie. It is the second year in succession that the Ministry of Pensions have been our opponents in the first round of the Cup, and we have suffered defeat on each occasion.

It was perhaps unfortunate that we had to sacrifice the luck of the draw which gave us choice of ground, and had it been possible, the game would have been played at Chiswick, but as no pitch was available we were forced to transfer the venue to Acton, where we invariably suffer defeat.

There are many interesting matches down for decision in the latter half of the season, and a return to the form displayed during the first three months should enable us to finish up in the top half of the table.

A BRIEF CHRONOLOGY FOR STUDENTS OF TELEGRAPHS, TELEPHONES AND POSTS.

BY HARRY G. SELLARS.

(*Continued from page* 68.)

1877, April 2	Bell telephone tried for the first time on a New York—Boston wire.
	Charles Jasper Glidden obtained the first telephone subscriber in the world at Lowell, Massachusetts.
1877, May ...	Telephone exchange established in Boston, U.S.A.
1877, June ...	Colonial Conference held at Sydney to consider the improvement of telegraphic communication between Australia and other parts of the globe.
	Professor Hughes discovered that, if two conducting bodies lie in loose contact and a current flows through them, there will be resistance at the point of contact, and their vibrations will vary this resistance in exact ratio to the cause producing the vibrations.
	Samuel Alfred Varley constructed a telephone receiver in which the charge and discharge of a condenser reproduced sounds and speech.
	Garnier and Pollard improved Varley's apparatus and produced a carbon transmitter.
1877, July 7 ...	Emile Berliner, of Boston, patented a carbon telephone transmitter which contained an induction coil.

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1877, July 20 — Edison patented a telephone transmitter with a diaphragm coated with platina foil against which pressed a spring, the point of which was faced with compressed plumbago. When the diaphragm vibrated it caused a variation of pressure on the plumbago point and a consequent variation in the resistance of the circuit. Inspired by his own and Graham Bell's experiments with the telephone, Edison invented the phonograph. The sounds were recorded on tinfoil.

1877, Sept. ... — Sir William Preece, Chief Electrician to the Post Office, recommended that the Department should secure the right to use and manufacture telephones.

1877, Sept. 29 — Col. Reynolds offered to exhibit Bell's telephone to the Post Office, but the proposal was not accepted. Later in the year, Fischer and Preece visited America and, on their return, suggested that encouragement should be given to examination and trial of the apparatus.

Preece exhibited a modified Bell telephone receiver at a meeting of the British Association at Plymouth.

Baudot telegraph system adopted by French Government.

Bright completed the series of cables connecting the various West Indian Islands.

Telephones first used on private wires.

1877, Nov. 20 — A. G. Bell patented a system of metallic circuits for telephone working.

1877, Dec. 14 — Werner Siemens patented a telephone receiver.

E. Sacher, of Vienna, measured the effect of induction in telephone circuits.

Kerr showed that a ray of polarised light is rotated by reflection at the end or side of a magnet.

18,000,000 Money Orders issued with value of £27,870,000.

1878, Jan. 1 ... — Commission for small Money Orders raised to 2*d.* for ten shillings and 3*d.* for £2.

Charge for registration of letters reduced from 4*d.* to 2*d.*

Registration fees for Inland and Foreign letters reduced to 2*d.*, and liability admitted up to £2. Special Registered Letter envelopes introduced. Number of registered letters reached 7,000,000.

1878, Jan. 14 — Prof. Bell and Col. Reynolds were presented to Queen Victoria at "Osborne House," Isle of Wight, and, assisted by C. Wollaston exhibited the telephone and exchanged conversation with Cowes, Southampton and London.

1878, Jan. 22... — Portion of a debate in the House of Commons telephoned to the *Daily News* office in Bouverie Street, London.

1878, Jan. 28... — First commercial telephone exchange opened at Newhaven, Connecticut, and a directory of subscribers provided. The Exchange was first opened from 6 a.m. to 2 a.m., but in March arrangements were made for attendance throughout the twenty-four hours.

1878, Feb. ... — Post Office asked Treasury for permission to hire telephones from inventors and supply them to private wire renters.

Bell Telephone Association dissolved, and the Bell Telephone Company and the New England Telephone Company formed.

Merritt Gally, of New York, introduced the "message by message" multiplex telegraph system, and a "differential telephone."

William Tegg published his work on *Posts and Telegraphs.*

Joseph Henry died at Washington.

1878, May ... — Hughes introduced a carbon pencil microphone.

1878, June 14 — First English telephone company registered under the title "The Telephone Company, Limited (Bell's Patents)."

1878, June 15 — Edison patented a carbon telephone transmitter.

1878, Aug. 7 — Treasury granted request made by Post Office in February.

1878, Aug. ... — Francis Blake, assisted by the American Bell Telephone Company, produced a practical telephone transmitter.

1878, Sept. 16 — Rev. Henry Hunnings, of Yorkshire, patented a granular carbon telephone transmitter with a platinum diaphragm. Mr. Edward Cox-Walker collaborated in its production.

(Bayley, of U.S.A., Berthon, D'Arsonval, Dejongh, Dolbear, Hickley, Mechalski, Roulez, Theiler and the Western Electric Co. devised telephone transmitters in various forms.)

Cox-Walker devised a telephone receiver with mica diaphragm and stirrup armature.

Stanhope devised a telephone receiver with a small iron disc fixed to a parchment diaphragm.

A. T. Collier, of Sydney, N.S.W., constructed a telephone receiver with two diaphragms the vibrations of which were projected through one opening.

Siemens and Halske introduced a telephone receiver containing a horseshoe magnet and a means of varying the distance between the diaphragm and the magnet.

1878, Oct. 4 ... — S. A. Varley patented a telephone transmitter of the Hughes microphone type.

Telegraph Act gave Postmaster-General full wayleave rights over railways authorised after Jan. 1, 1878.

International Postal Union, in Paris, dealt with Money Orders and insured articles.

German Post Office, at Congress of the Postal Union held in Paris, raised again the question of passing letters with declared value. Arrangement adopted as subsidiary and optional.

1878, Nov. 1 ... — Bright introduced an automatic printing telegraph using perforated paper tape for transmission and a typewheel for reception.

Hughes described to the Royal Society a transmitter which he called a "microphone."

Edison introduced his loud-speaking telephone.

John Matthias Augustus Stroh fitted clockwork to Edison's phonograph.

1878, Nov. 11 — Edison's telephone transmitter tried on a telegraph line between London and Norwich.

Edison invented the electric pen-writing telegraph system.

(Jordery and J. H. Robertson also devised writing telegraph systems and an apparatus named the "Telautograph" or "Telewriter" was introduced.)

Paul La Cour and Lord Rayleigh, working independently, invented the phonic wheel.

Rayleigh also devised a method of measuring electromotive force. Streets lighted by electricity for the first time. Jablochkoff candles used in the Avenue de l'Opera, Paris.

Edison devised an electric lamp in which the filament consisted of a platinum spiral.

Metzger experimented in connexion with electrical accumulators.

Quadruplex telegraph working introduced in Postal Telegraph service.

Average annual number of letters passing through the Post Office—974,000,000.

1879, Jan. 20... — Blake telephone transmitter patented in the name of William Robert Lake.

Bell invented the Membrane Telephone receiver, the diaphragm of which was composed of goldbeater's skin.

Bell and Tainter devised the "Photophone" in which they took advantage of the fact that the resistance of selenium is affected by light. They also produced the "Radiophone" in which heat waves were utilised.

A. B. Bach devised the "Resonator."

Gower patented a telephone receiver with a semi-circular permanent magnet. A flexible tube conveyed the sounds to the ear.

1879, Feb. 1 ... — Louis John Crossley's carbon pencil microphone patented.

Blakey and Emmott introduced a telephone switchboard on the Umschalter principle.

L. B. Firman fitted multiple telephone switchboards in the Chicago Exchange.

Count du Moncel published his work, "The Telephone, the Microphone, and the Phonograph."

1879, Feb. ... — Bright patented a series of improvements in telegraph relays.

1879, Mar. ... — Edison produced a telephone receiver known as the "Chalk receiver," "motograph receiver," or the "electromotograph."

1879, Mar. 12 ... — Hughes invented an induction balance. In a paper read before the Society of Telegraph Engineers and Electricians he suggested the twisting of two wires to obviate induction.

David Brooks, of Philadelphia, introduced underground cables, the conductors of which were insulated with mineral oil. He also used blown glass insulators for telegraph poles.

(*To be continued.*)

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THE

Telegraph and Telephone Journal.

VOL. XV. MARCH, 1929. No. 168.

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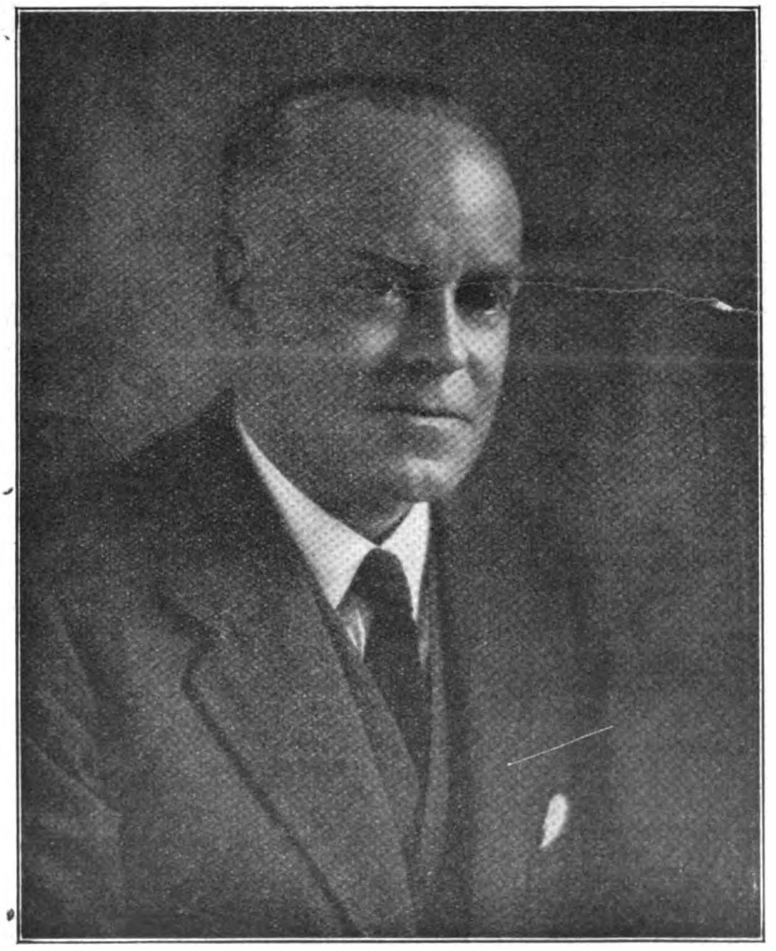
TELEGRAPH AND TELEPHONE MEN AND WOMEN.

LXII.

MR. H. J. LENTON.

WE break new ground this month in presenting on this page the portrait of Mr. H. J. Lenton, the Postmaster-General and Secretary for Telegraphs of the Union of South Africa, and hope thereby to establish a happy precedent for widening the field of our series of Telegraph and Telephone Men. He is no stranger to this country, as he represented his Government at the Imperial Wireless and Cable Conference held in London last year. Prior to that he was the chief South African delegate at the International Radio Conference in Washington, U.S.A.

Mr. Lenton was originally in the Telegraphs, but early in his service was transferred to the Secretariat, and has been in the Administration for nearly thirty years. He passed through various grades in the Secretary's Office before reaching his present position, and in doing so gained an unrivalled knowledge and grasp of Departmental affairs. He was appointed Assistant Secretary in 1923, and while in that position was the first Chairman of the newly-formed Post Office Departmental Committee, the nearest approach to Whitleyism in the South African Civil Service, and much of the success of this body may be attributed to the lead given by Mr. Lenton, and the good tradition set up under his chairmanship. Since he became Postmaster-General in 1926 his administration has been characterised by the same broad outlook.



Photograph by Harris & Ewing, Washington.

The reversion to penny postage and the introduction of new services and facilities has led to great expansion and development in every sphere of Post Office activity in South Africa, and with the still greater development of a growing country it is certain that Mr. Lenton will keep well abreast of all that is best in modern administration. Mr. Lenton is also the Government representative on the Directorate of the South African Wireless Company, Limited, the Company which operates the Capetown terminal of the London—South Africa Beam Service.

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HOW TO IMPROVE THE TELEGRAPH SERVICE.

II.—BY A SORTING CLERK AND TELEGRAPHIST AT A PROVINCIAL OFFICE.

(NOTE.—*The Editing Committee accept no responsibility for the views expressed in this series of articles.*)

WHILE it is an undoubted fact that the findings of the late Committee, appointed by the Government to enquire into conditions in the Telegraph Service, have revealed a rather unsatisfactory state of affairs, it is equally true that the suggestions put forward for its improvement have fallen far short of providing measures in the nature of a remedy. This is scarcely a matter for wonder. Conditions governing the telegraph service are peculiar to that service alone, and it is unfortunate that the opinions of individuals, whose interests are not only bound up in its practical side, but who have, in the main, a keen desire for its future well-being, were not more in evidence.

To be of service, either socially or commercially, a telegram must reach its destination as soon after being handed in as possible, and in addition must be transmitted with absolute accuracy. The Post Office has also to consider how this is to be done with a due regard to economy. Economy, however, must not be carried beyond a certain point, otherwise efficiency will suffer. These facts must be borne in mind if any real attempt is made to improve the present service.

It is questionable if the telegraphs, even with the most rigid economy, can ever become a really profitable proposition. This has been admitted by more than one authority. The depressed condition of trade since the conclusion of the war, coupled with the incidence of cheaper telephonic facilities, has had a serious effect upon telegraph traffic, and has introduced a further complication of the problem. The number of non-users of the telephone must, however, still be considerable, and it is not outside the bounds of reason to suggest that, by a slightly cheaper service for short-distance messages, a large increase in traffic would result, and that the volume so obtained would show a profit.

There is a prevailing impression that the telegraph service is slow, and its weakness in this respect has frequently been exposed by correspondents in the columns of the daily press. The fostering of this impression is bound to do incalculable harm. A member of the public who handed in a telegram at midday at the counter of a large provincial office for a destination not a hundred miles away, asked the counter clerk in all seriousness if his message would be delivered the same day. The address was not out-of-the-way, and there was no notice of an interruption of communication. The answer is not reported, but it should be possible for any counter clerk to give an assurance that any message to a normal address would be delivered within, at the very most, an hour's time. Where alleged cases of delay or mis-treatment are reported in the daily newspapers a thorough enquiry should be undertaken, and when explanations which may exonerate the service can be furnished, these should be published in the same columns. The silent contempt with which accusations and charges of all kinds against the Post Office are treated only serve to convince the "man in the street" that there exist good grounds for such complaints.

The confidence of the public must be regained, and that by the extensive advertisement of a speedier and more efficient service. How can a speedier service be attained? It is suggested in some quarters that what is needed is a greater output per operator. It has been shown that in comparison with the telegraph service of another country the output in the home service is smaller than it ought to be. Unfortunately, a comparison of the conditions under which the respective outputs were obtained has not been supplied.

For a considerable period the telegraph system in this country has been in a state of transition from Morse to machine apparatus, and even at the present moment it cannot be said to be completely stabilised. On circuits of primary importance Morse has in turn given way to Systematic Wheatstone, Baudot and Autoplex. On those of secondary importance, Morse has been replaced by the Morkrum teletype, and this, after extensive experimenting, has been ousted by the Creed teleprinter. Neither apparatus nor operators have been given a fair chance. From the results obtained and the experience acquired it should now be possible to select the best all-round systems and adopt them as standard.

Of those mentioned there are two which would appear to to have claims in this direction, the Baudot for a primary circuit, and the Creed start-stop for the others. The Autoplex, though capable of dealing with a higher output, undoubtedly causes a tremendous strain upon operators, while its greater proneness to faults, and consequent inaccuracies, renders it unsuitable for general adoption. It is a more costly instrument to install, and it is questionable if, taking everything into account, its higher rate of speed compensates for its disadvantages in this and other directions. The general use of the Morkrum appears to have been discontinued. This is a move in the right direction. Experience shows that the Creed is a more reliable piece of apparatus and, notwithstanding a slight weakness in some parts of its construction, its adoption on all circuits with a medium traffic return would be generally advocated. The introduction of the three (or more) stations Baudot may be defended on the ground of economy, but it should not be forgotten that it has tended to multiply the risks of stoppages, and consequent delay to traffic.

It is of the utmost importance not only that should there be qualified Dirigeurs in charge of such circuits, but each should be thoroughly expert. A breakdown at one station not infrequently means the collapse of communication between the three. Dirigeurs should receive a sound training not only on the theoretical side but also in all departments on the practical side. The present course of training is too short from this point of view to be of any value. Greater attention should be paid to the speed of running of the distributor, and in this connexion it would be advisable to standardise one type of reed. At present, about five different types are in use in a large provincial office, and as each type is known from experience to have certain peculiarities of adjustment, the difficulty of regulating speed is thereby increased.

The introduction of the underground has no doubt led to almost perfect stabilisation of line communication, but it has also tended to create small technical troubles which are not easily identified, and which frequently cause stoppages of some duration until rectified. As these are more commonly observed on duplex circuits, unidirectional working (sending on one arm, receiving on another), should be adopted in preference to working one arm duplex.

Similar arguments hold good in the case of the Creed teleprinter, and in this case operators should be given a thorough training in its technical details as well as operating. Like the Baudot, it should be worked under simplex conditions wherever possible. To obtain the best results from the teleprinter its operators should be kept in constant practice, but too long spells of duty should be avoided.

The policy of the Department to increase the proportion of women to men having become operative, it is probable that in a short time female operators will be largely employed at all important circuits. It is therefore a matter for serious consideration whether the present method of their employment should be continued.

Efficient working cannot be expected from operators unless they are fully employed at their own work. Telegraph operating and postal work are in their nature as wide apart as the poles, and

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if female operators are to have a fair chance their employment on Branch Office work should be curtailed. The necessity for the Sorting Clerk and Telegraphist in all large offices has passed and the whole matter should be reviewed in the light of present-day experience.

There is a tendency to lay too much stress on administrative and writing work in the telegraph service to-day. The promotion on the manipulative side of officers whose qualifications in other directions may be on a par, but who have more experience in writing work, in preference to those who have devoted their attention mainly to the technical side is a seriously disturbing feature of the modern telegraph service. Such a policy tends towards the elimination of interest in the development and improvement of telegraph apparatus, whereas every encouragement should be given to foster and intensify that interest. While it is admitted that qualities of a highly exacting standard may be necessary in regard to administrative and clerical duties, it is equally necessary to have these qualities plus an efficiency in technical matters for the performance of supervising duties in an instrument room. The introduction of machine apparatus into the telegraphs has created a new standpoint in reference to promotion, and this important fact should not be overlooked.

The downgrading of testing work would appear to be another retrograde step when it is considered that the test-room is the nerve centre of the whole telegraph structure. The importance of having a thoroughly efficient officer in charge of this branch cannot be too strongly emphasised. There is a great responsibility attached to the work and position and remuneration should be more in keeping. The maintenance of line communication is not the only factor under his control, but he is also responsible for the efficiency of all the apparatus attached to his office.

A point which must not be omitted is that of the relationship between staff and traffic, but until the system of machine telegraphy has been properly established attempts to create rigid staffing standards will inevitably result in failure. As a result of the present standards, which would appear to have been based on an ideally perfect system and are not sufficiently elastic, staffs have been reduced to an extent that the slightest increase of traffic means an abnormal delay and causes a state of confusion.

This is the position in the service to-day, but the situation is not beyond redemption, and if only the authorities responsible tackle the problem in a fair and broadminded way, there is every reason to hope that the British telegraph service will regain some of its former prestige and lay claim to be regarded as "second to none."

[The next article in the series, by an Overseer at the Central Telegraph Office, will appear in our April number.]

THE G.P.O. PLAYERS' DRAMATIC SOCIETY.

AN original play is always a great event in the life of an amateur society. The G.P.O. Players are fortunate in being able to announce as their next production "Jugged Heirs," an original comedy, to be produced by the author, Mr. H. Hodgson-Bentley, the founder and director of the Southend Repertory Co.

It will be remembered the G.P.O. Players were the first to perform Mr. Ralfe Davies' "Thomas More," and evidently Mr. Hodgson-Bentley, who acted as producer on that occasion, was so impressed with the performance of the company that he feels that a composition of his own will receive appropriate treatment.

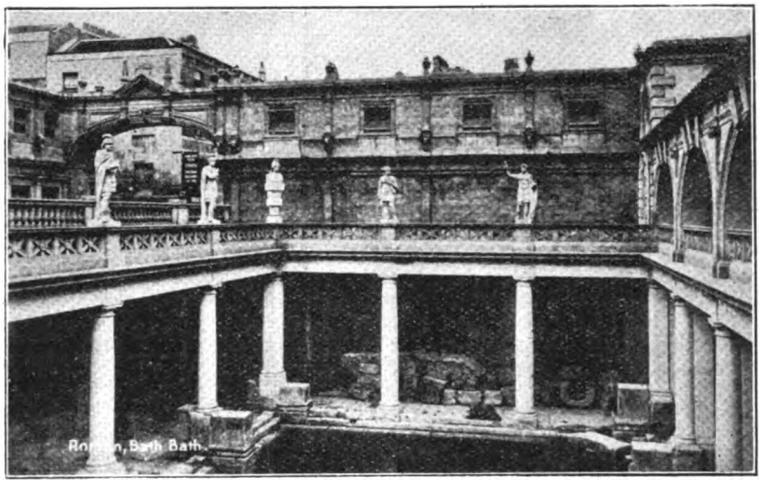
This production will take place at the Guildhall School of Music Theatre, John Carpenter Street, Victoria Embankment (two minutes from Blackfriars Station), on Friday and Saturday, Mar. 15 and 16, commencing at 7.30 p.m. Tickets, *5s.* *9d.*, *3s.* *6d.*, *2s.* *4d.* (all reserved), may be obtained post free from Mr. L. Gartland, Room 26, Ground Floor, G.P.O. North, E.C.1. No tickets will be sold at the doors.

BATH.

INTRODUCTION OF AUTOMATIC TELEPHONE WORKING AT BATH.

BY J. M. CROMBIE.

BATH, that city of deathless memories, where many of the greatest men have lived, and where most of the famous people of the 18th century resided at some time or other, has a history extending over 2,000 years. The 18th century and the early part of the 19th was the time of the city's greatest prosperity. During that period persons of note flocked to "The Bath," where ills of mind and body disappeared in the healing waters and the whirl of pleasure. Amongst those visitors were the great statesmen, Pitt; Wilberforce, of slavery fame; Burke, the orator and member for Bristol; Oliver Goldsmith; Horace Walpole, and the Earl of Chesterfield. Thomas Gainsborough, the eminent portrait painter, knew the city well, and Sir Thomas Lawrence studied there for 3 years. It was at Bath that Herschel discovered the new planet Uranus, and there, too, Sheridan wrote some of his most amusing comedies. Many distinguished soldiers and sailors either came on holiday to Bath or lived there. Lord Clive, founder of the Indian Empire, spent his last days in "The Circus," that stately and dignified example of domestic architecture at its best. General Wolfe, of Quebec, lived at Trim Street, and the hero of Trafalgar also resided for a time in the city.



THE ROMAN BATH, BATH.

From the postal point of view, it is of interest to recall that two prominent citizens of Bath, Ralph Allen and John Palmer, were pioneers in Post Office reform. In 1720, when Allen was only 26 years of age, he originated a scheme of cross-country posts, whereby letters &c., were carried direct from one town to another instead of circulating via London. The scheme worked so well that Allen was given the entire management of it. It is said that for over 40 years he made an income of £12,000 a year from his postal activities, and most of this large sum was expended by him for the good of the city. John Palmer was the son of a prosperous brewer in Bath and was born in 1742. For a time he acted in London as his father's agent in connexion with the theatre of which his father was proprietor. In the course of his travels about the country Palmer observed how indifferent were the means of communication, both for travellers and the Postal Service. The establishment of Ralph Allen's cross-country post services had been a great boon to the public, and Palmer resolved that he would try to do something to make the delivery of letters more frequent and expeditious. At that time letters were carried by mounted post boys, or in mail carts, and both these modes of conveyance were slow. Palmer prepared and submitted a scheme in which he proposed that letters should be carried in four-horse coaches with no outside passengers, and that the coaches should be guarded against the attacks of highwaymen. At first the scheme was regarded as impracticable, but ultimately it was decided that a trial should be made of it. On Aug. 2, 1784, Palmer watched the first mail coach start from Bristol for London. His scheme was so successful that, within a fortnight, coaches started running from London to many of the larger towns in England, and two years later the first coach ran to Edinburgh. The system proved economical, as well as speedy and safe. It enabled the Post Office to give the public a daily service of letters instead of only 3 times a week. As a result of this great reform, Palmer was presented with the Freedom of many of the great cities of England and Scotland, and the Corporation of Bath possesses a silver cup given to him by the Glasgow Chamber of Commerce.

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During the past few years the Post Office has dealt generously with Bath. On May 16, 1927, a handsome new Post Office, in keeping with the architecture of the city, was opened by the Mayor, Alderman Cedric Chivers. In this building ample accommodation was set aside for the housing of an automatic telephone exchange to replace the existing manual exchange. The work of installing the auto exchange was duly proceeded with and completed, and the transfer to the new system effected at 2 p.m. on Jan. 26.

THE CIRCUS, BATH.

The particular system selected for the Bath area is known as the Standard Automatic Multi-Office System, and admits of the inclusion of all exchanges within 5 miles of Bath in the one scheme, the same numbering scheme being used throughout.

For the present, the Bath and Batheaston Exchanges only have been converted to automatic working. The other exchanges in the Bath Local Fee Area, viz.: Combe Down, Limpley Stoke, Newton St. Loe, Saltford, and Weston (Bath) remain manual, and retain their present numbering schemes.

Numbering Scheme.—Subscribers' lines connected to Bath and Batheaston Exchanges are numbered :—

Bath	...	2000-5199
Batheaston	...	8100-8299

MANUAL BOARD WITH SUPERVISOR'S DESK.

Dialling.—Subscribers on Bath and Batheaston Exchanges are able to call other subscribers on these two exchanges by manipulating a *dial*. This piece of apparatus is associated with every automatic subscriber's installation. The full *number* required is dialled. This action routes the call to the required exchange and number.

Dialling-out Exchanges.—The five manual exchanges in the Bath Local Fee Area are obtained by Bath and Batheaston subscribers by a dialling-out code.

The codes are :—

Combe Down	... ...	63
Limpley Stoke	... ...	65
Newton St. Loe	...	66
Saltford	... ...	64
Weston (Bath)	... ...	62

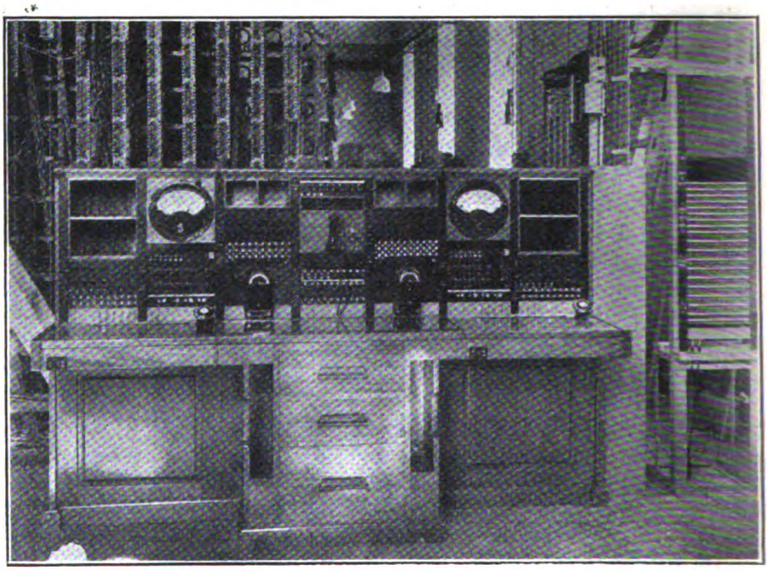
Automatic subscribers requiring a number on any one of these five exchanges dial the appropriate code. This action lights an incoming junction lamp at the distant exchange, where an operator answers and effects the call.

Manual Switchboard.—A manual switchboard is provided in the Bath Exchange building to deal with two-unit calls, trunk calls, calls for rural party lines, enquiries, complaints, and service calls. There is no manual board at Batheaston. All calls to and from Batheaston subscribers circulate through Bath. Calls dealt with manually are controlled at Bath.

For calls which are dealt with at the manual board, automatic subscribers dial the following numbers :—

Two unit and trunk	0
Enquiries and complaints	91
Service	92
Calls *for* a subscriber on a rural party line	93

Calls for "telegrams" are obtained by dialling 90, and calls to "test desk" (Bath and Batheaston Exchanges only) are obtained by dialling 99.



TEST DESK.

These two services are not dealt with at the Bath manual board. On dialling 99, the subscriber is automatically connected to the phonogram room at Bristol, some 12 miles distant from Bath.

The manual equipment consists of the following :—

"A" positions	5
"A" and "B" mixed position ...	1
Cordless B position	1
Enquiry positions	3
Test desk positions	2
Filing sections	1
Supervisor's desk	1

A feature of special interest is the provision of a cordless "B" position to deal with the traffic incoming from the Bristol local exchange. In this case the operator is provided with a strip of digit keys of the type shown below :—

1	2	3	4	5	6	7	8	9	0

The "B" operator at Bath receives the request for the call over the Bristol local exchange order wire and assigns a junction as in manual practice. She then associates automatic sending apparatus with the junction by the depression of a cord circuit key, and sets up the call by depressing in succession the digit keys corresponding to the wanted number. The sending apparatus operated by the digit keys then transmits the requisite trains of impulses as though the number had been dialled. This method is much quicker than that of dialling, and is justified on account of the large volume of incoming traffic from Bristol local exchange.

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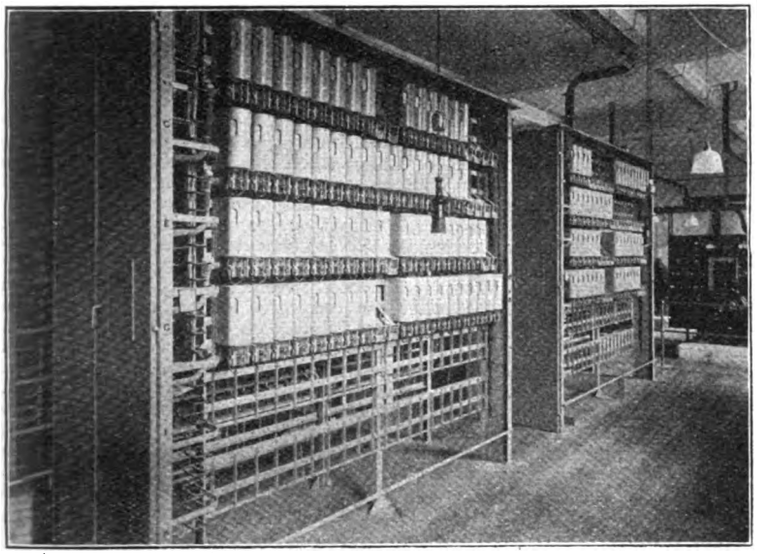
Special Faults Circuit.—An important feature of the manual board equipment is the provision of a special faults circuit. This circuit appears in the outgoing junction multiple of the Bath manual board, and terminates on a telephone in the automatic apparatus room. It is used by operators for reporting to the engineer urgent faults which seriously affect the service by holding up switches.

Switch-hook and Disconnection.—When an automatic subscriber is through to another automatic subscriber, a dialled-out exchange, or "telegrams," the replacement of the calling subscriber's receiver automatically restores all switches to the normal position. Except in the case of calls to "0," "91," "92," and "93," automatic subscribers are warned to avoid touching the switch-hook during a conversation, otherwise it may be necessary to redial the number.

In the case of calls obtained via the Bath manual board, however, the switches are held by the manual exchange, and standard "flashing" facilities for subscribers are thus provided.

P.B.X. and Auxiliary Groups.—Special facilities are provided on certain groups of automatic switches to meet the needs of subscribers with auxiliary lines. Such subscribers are generally known by the first number of the group. When this number is dialled and is found to be engaged, the switch automatically "searches" or moves on to the next number, and so on until a disengaged line is found. If, however, all the lines in the group are engaged, the "busy" tone is connected.

It is also important to note that if any number other than the first of a group be dialled, searching does not take place; e.g., if the second number



FIRST AND SECOND NUMERICAL SELECTOR BOARDS.

of a group be dialled, connexion is made with that number. If it be engaged or out of service, the switch does *not* search for a free line.

Dialling-in.—Facilities are afforded on all "no delay" basis routes (except the Bristol local incoming circuits) terminated in Bath, whereby Bath and Batheaston subscribers can be dialled direct. A dial is fitted on every position at the distant or "dialling-in" exchange, and the operators at those exchanges dial the required numbers in the same way as an automatic subscriber does. This operation is known as "dialling-in." For effecting "through" calls, the distant exchanges dial "0," and call the Bath manual board on a special group of answering jacks, known as DX "0" lines.

The capacity of each exchange is as follows:—

	Present.		Ultimate.	
	Line Switches.	*Final Selectors.*	*Line Switches.*	Final *Selectors.*
Bath	3,040	3,200	4,900	4,900
Batheaston ...	190	200	Not yet fixed.	

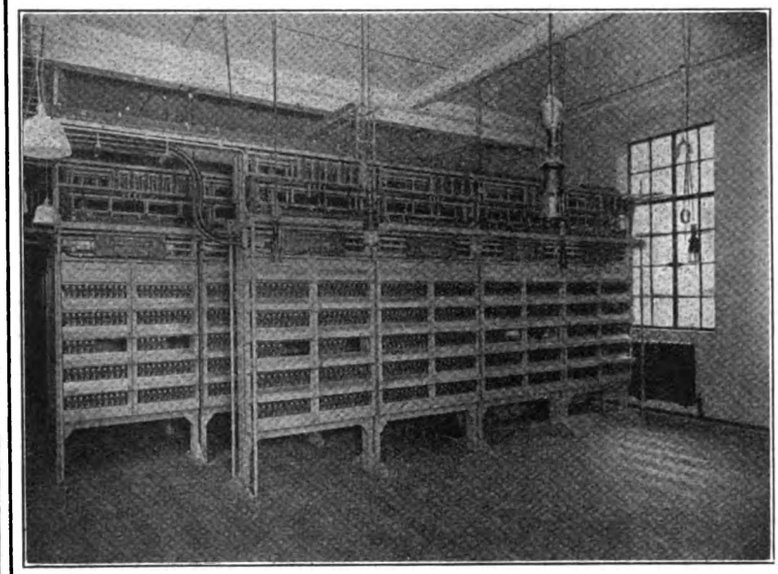
Because Batheaston Exchange takes the same numbering scheme as Bath and is dependent on Bath for effecting all calls dealt with manually, it is known as a "satellite" exchange to Bath.

Switching Apparatus.—The switching apparatus at Bath Exchange is divided into four groups:—

(*a*) Pre-selector or line switch.
(*b*) First group selector.
(*c*) Second group selector.
(*d*) Final selector.

At Batheaston Exchange line switches and final selectors only are fitted, all calls circulating through Bath for connexion with 1st and 2nd group selectors. The small volume of local traffic at Batheaston makes such a course economical.

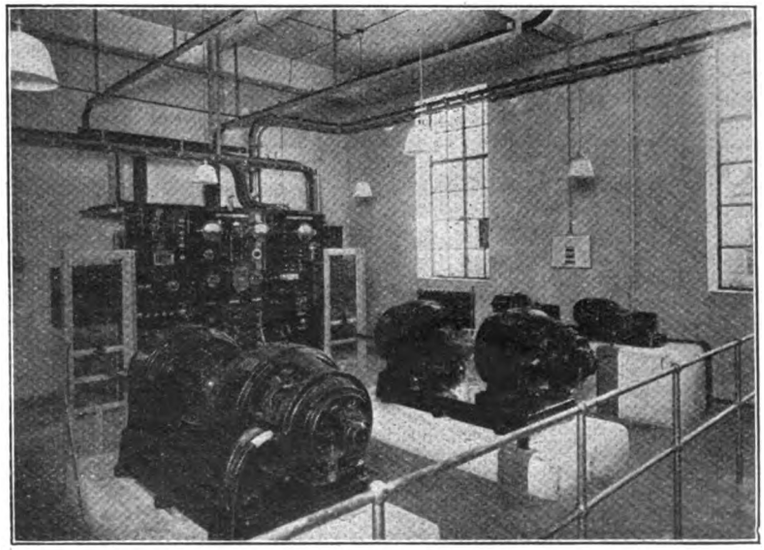
Line Switches.—A line switch is associated with each individual subscriber's line. When a subscriber lifts his receiver, or, in the case of a P.B.X., calls the exchange on any one of the exchange lines, the line switch connected to the line in question operates, and gives access to a 1st group selector.



LINE SWITCH AND FINAL UNITS.

It should be explained that, while line switches are provided on the basis of "one per direct exchange line," the 1st, 2nd, and final selectors are provided according to the requirements of the volume of traffic to be dealt with in the busy hour.

Recording of Calls.—Each subscriber's line is fitted with a register. Registration is effected when the called subscriber takes off his receiver. If the called subscriber does not reply, or if the "busy tone" or "number unobtainable tone" is heard, registration does not occur. When a subscriber calls an operator at a "dialled-out" exchange by dialling a number (e.g. 62 for Weston (Bath)) the operation of the register is controlled by means of a "registration control" key at the distant exchange when the called subscriber has been obtained.



POWER EQUIPMENT.

Alarm Signals.—Alarm signals, which operate after 3 minutes, are provided on final selectors to indicate that a calling subscriber has failed to replace his receiver after that of the called subscriber has been replaced. Similar signals are provided on 1st selectors to indicate that a called subscriber has failed to replace his receiver after the calling subscriber has done so, and to indicate that a calling subscriber has removed his receiver without dialling. The Engineering Department deals with such cases.

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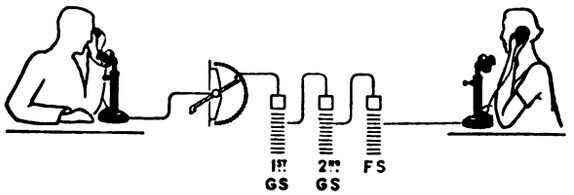
Signalling Tones.—Dialling Tone (*DT*).—When a calling subscriber's line is through to a 1st selector, this signal (a *continuous* low pitched " burring " sound) is heard, indicating that dialling may be commenced. Dialling should not be commenced until this tone is heard.

Ringing Tone (*RT*).—When a connexion to a called number is effected, and the called subscriber is being rung, an *interrupted* low-pitched tone, corresponding to the ringing, is heard by the calling subscriber. This continues until the called subscriber answers, or until the call is abandoned.

Busy Tone (*BB*).—If the line, or every line, of the called subscriber, or every outlet between two sections of the automatic apparatus, is engaged, a *periodic* high-pitched " buzz " is heard by the calling subscriber. When this occurs before the last digit of the number wanted has been dialled it indicates that the apparatus is engaged. When it occurs after the complete number has been dialled it indicates that the line is engaged. The receiver should be replaced in either case and the number dialled again after an interval of about two minutes.

Number Unobtainable Tone (*NU*).—When a spare number, a faulty number, or a number that is temporarily out of service is dialled, a *continuous* high-pitched " buzz " is heard by the calling subscriber. When this is heard the subscriber should replace the receiver, then lift it again and re-dial the number. If the number unobtainable tone is still heard, the subscriber should dial 91 (Enquiries) if he wishes to ascertain the reason why it is unobtainable.

Changed Number Lists.—Lists showing the old and new numbers of Bath and Batheaston subscribers were exhibited on the Bath manual switchboard, and formed a ready reference. Copies were also distributed extensively to exchanges throughout the district.



A CALL IN PROGRESS.

Directory Supplement.—A supplement to the existing Telephone Directory, bearing the new numbers of Bath and Batheaston subscribers was issued, in advance of the automatic transfer, to the subscribers on these two exchanges.

Advising Subscribers.—A preliminary letter was sent to each Bath and Batheaston subscriber, informing him of the forthcoming alterations, and notifying the change of number. A final letter, repeating the new number and giving the date and time of the transfer, was also sent to each Bath and Batheaston subscriber 4 days in advance of the transfer.

A complete demonstration set was fitted up at the Bath Head Post Office for 3 months prior to the transfer, and demonstrations were given daily at specified hours by an officer specially trained for the purpose. This arrangement proved of great interest to members of the public, nearly 1,700 of whom attended the demonstrations.

A Multi-Hall coin box was also joined up to the set, showing the whole operation with regard to the manipulation of buttons A, B, &c.

Arrangements were also made for every Bath and Batheaston subscriber to be visited by an officer of the Post Office, who explained in detail what was involved under automatic conditions. Each officer was supplied with a card list of the subscribers in district order, instruction cards, and a schedule of the course of instruction to be given to subscribers. The officers were given a few days training before commencing their visits.

Training of Staff.—When the new manual equipment at Bath was available, opportunity was taken, in advance of the transfer, to train the whole of the operating staff in the working of the new apparatus.

Testing Circuits after Transfer.—All subscribers' circuits were tested by the operating staff after the transfer. Each subscriber was called, and a test made of the speaking and signalling. To facilitate this work 16 special telephones were provided in a room adjoining the new manual exchange.

The visiting officers ascertained and recorded whether or not the subscribers' premises were to be open at the time of transfer, and from these records lists were prepared of the lines to be tested (*a*) immediately after the transfer was effected, and (*b*) on the following day, or later if necessary. Test calls made by subscribers, or by engineering officers from subscribers' premises, were credited by ticket.

[*The photographs of the plant with which this article is illustrated were kindly supplied by the Contractors, Ericsson Telephones Ltd., of Nottingham.*]

INTERNATIONAL TELEPHONY.*

BY H. TOWNSHEND.

(*Continued from page* 89.)

Organisation of New Services.

THE opening up of services between new countries in Europe has been so rapid in the last 2 or 3 years as to constitute a considerable volume of administrative work and I think it is relevant to describe how a new service is organised. The C.C.I. is not directly concerned with the organisation of individual services. Its machinery, however, keeps the administrative and engineering staffs of the various European countries in continuous touch; so that, when there is a prospect of a suitable circuit becoming available from—for example—this country to a part of Europe not yet linked up with it, the terminal administrations, i.e., the British Post Office and the Continental country at the other end of the circuit, are aware of the possibilities and can start in time negotiating the necessary arrangements for opening the service. The main points to be settled are the rates and the division of the revenue they are to bring in between the various countries through which the line passes; and the accessory services to be provided. I will come back to these points later. The first task of the C.C.I. was naturally—as I have said—engineering co-operation to provide the new plant for the international services; this still, of course, continues; but it may be said, I think, that we are now in the second stage of progress, that of organising the administration of the services.

The International Telegraph Conference and the International Telephone Regulations.

The procedure of organisation has been very much simplified by the drafting and approval at the last general International Telegraph Conference (held in Paris in 1925) of a set of Rules called the International Telephone Regulations. The Telegraph Conference incidentally took over a general responsibility for the pre-existing and formerly independent C.C.I., which now occupies itself to a considerable extent on the administrative side with drafting fresh Regulations for consideration at the next Telegraph Conference—due in 1932. The International Telegraph Conference (which meets only every five years or so) differs fundamentally from the C.C.I. (which meets annually) in that, while the latter can only give advice, the Regulations passed by the Telegraph Conference are binding on all the administrations, including the British Post Office, which are members of the International Telegraph Convention—a permanent institution resting on diplomatic sanction, and dating back to 1875. (This, of course, applies equally to telephone and telegraph regulations.) It was, therefore, necessary in 1925, owing to the lack of experience of international telephony in Europe, to keep the regulations governing telephones in rather a skeleton form, and, in particular, to provide in certain instances for various alternative ways of doing the same thing. The International Regulations are a dull subject but they are so fundamental a part of the administrative machinery that I am afraid I must say something about them.

The Regulations, after laying down some rather obvious general principles, such as that the Administration of each country provides and maintains the international lines passing through its own territory and that these should be maintained and worked as well as possible, pledge the Administrations to conform as far as possible with the recommendations of the C.C.I. on technical questions. The object of this is to encourage the standardisation of line equipment in accordance with the best practice, after discussion by all the experts of the various countries represented on the C.C.I. It is provided that ordinarily an international line is reserved exclusively for international telephone calls and that when the internal lines of the country are being used for international calls the latter get priority over the internal calls. This is very important. In practice each of the important international services is served by means of a number of " through lines " between telephone centres in the terminal countries; for example, the Anglo-German service has now 15 through lines terminating at London in this country and at Berlin, Hamburg, Cologne, Frankfort, Dusseldorf and Bremen in Germany. (Each country, of course, selects its own terminal exchanges—" *tetes-de-ligne* "—for international traffic with each other country.) These 15 lines are used for Anglo-German calls and for nothing else (except for a comparatively small number of calls to some countries beyond Germany, like Czecho-Slovakia, which have not yet enough traffic to fill up a through line to England). If a call, for example, from Glasgow to Dresden has to pass over the ordinary Glasgow-London and Berlin-Dresden trunks in Great Britain and Germany respectively, it takes precedence over all the internal calls on those lines; that is to say, the call from Glasgow to Dresden cannot be delayed on account of pressure of communications between Glasgow and London or between Berlin and Dresden.

The Regulations also provide for a skeleton system of routine testing, which has since been considerably developed by the C.C.I., and for some practical details, such as the interchange between the Administrations of telephone directories for service use. They also lay down a set of operating rules about the way in which calls should be passed over the international

* Paper read before the Institute of Public Administration on Dec. 13, 1928.

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lines, but these hardly go beyond general principles. As regards types of service, they provide for an optional service of "Urgent" calls, i.e., calls paid for at a higher rate, taking priority over ordinary calls (I will return to this point when dealing with rates), and also for a category of super-urgent calls called "Lightning Calls"—this service is also optional. It is laid down that Government calls, which are defined, get compulsory priority over ordinary calls, but no preference as regards charges.

The Regulations further lay down the general principles—*only* the general principles—of charging. It is compulsory to charge a minimum rate, between any two given places, covering 3 minutes' conversation, and to make a proportionate charge per minute on the excess over 3 minutes. The circumstances in which calls can be cancelled are laid down. It is provided that calls should be charged for whenever put through to the telephone number asked for, i.e., whether the person who answers is the one who is wanted or not; but an optional auxiliary service, called "*Préavis*" ("forewarning"), at a higher rate, is also provided for—this enables a call to be booked with the name of the person wanted as well as his number, and a report is then made to the caller's telephone by his exchange (which ascertains the facts from the other end), if this person is not available.

"Personal" Calls.

In passing, I want to go into this question in some detail. I mentioned, *à propos* of the general theory of telephone service, the truism that its real basic object is to put two *people* into oral communication with each other. In short-distance services, given efficient and rapid means of communication between any two *telephones*, it suffices to see that as many people as possible have telephones in their houses and offices and that these telephones and their warning bells are arranged in the respective buildings in the most handy way possible. If the person wanted happens to be out, the caller has to make and pay for another call; it would not be possible for the telephone administrations to undertake to find particular *people*—i.e., to insure the caller against the risk of not getting the man he wants—without incurring expenditure which would necessitate charging an insurance premium, in the form of an additional rate, which would be out of proportion to the small amount of the caller's money at stake on a short-distance call; this amount is, of course, measured by the ordinary minimum charge for a 3-minutes' talk. Looking at the question from the cost side, the greater part of the cost of handling a short-distance call is (speaking generally) the operating and switching plant costs; economic efficiency, therefore, demands that these be kept as low as possible, thus leaving no room for the extra operating involved in finding individual people, as distinct from connecting their telephones. But in long-distance service the position is quite different. Here the caller, while he is speaking to the distant subscriber, has to be given the *exclusive* use of thousands of pounds' worth of line plant. The main cost of a long-distance call is therefore represented by the value of the line-time, which is proportionate to the duration of the period during which the expensive long line is held at the caller's disposal. The operating costs are relatively small; and it is economically sound to elaborate the operating if by so doing you can increase the return from the line. If a long-distance call is merely put through without any preliminary warning and the line has consequently to be held up uselessly while the called person is being found, for perhaps the greater part of the 3 minutes for which the caller must pay, or even if, when the call is put through, the line is held only long enough for the person who answers the telephone at the far end to inform the caller that the man he wants is out, there is material economic waste. Various methods have grown up for eliminating this waste by setting up operating machinery for trying to ensure in advance, with a minimum use of the international line, that the called person will be in when the call comes through, and also, after ascertaining that he will be in, to get him put on the telephone promptly and without further cost to the caller when the call is about to be put through—if possible just in advance, while the expensive long line is being used and paid for in connexion with the previous call. The first of these steps is to some extent provided for by the *Préavis* system which has grown up in Central Europe. The second, and additional, step has, so far, been taken only in America and in Scandinavia. Although the methods vary somewhat and are called by different names, it is convenient to describe the completer method as the "Personal Call" service. The complete personal long-distance call service has three characteristics. First, the telephone Administrations co-operate as far as they can in putting the caller into touch with the called person, in return for an additional fee. Secondly, if they do not succeed in doing this, the caller only pays this fee and does not pay the ordinary rate for the call. (The fee, from his point of view, therefore, represents a complete insurance premium against the risk of having to pay for a 3-minute call which is of no use to him.) Thirdly, when the call is put through, the charge for the talk does not begin to run until the caller and the person whom he has asked for are both on the telephone and connected with each other. A little reflection will show that the whole essence of the system is really contained in the last proviso; because, once the Administrations agree not to charge for the use of the line until the two particular people have been put into touch over it, they have (*ipso facto*) admitted that the object of the service is to offer a kind of insurance to the caller, and, therefore, that the premium should completely cover the risk; and, once this is conceded, the Administrations are bound in their own interests to do all they can to see that this risk is obviated so that the policy does not become a claim. The *Préavis* differs fundamentally from the personal call because the supplementary fee for the *Préavis* is charged merely for the preliminary warning, after which the Administrations take practically no further responsibility. For example, if the answer to the warning call is favourable, the call is put through when its turn comes—possibly some time later if there is delay on the line—without any further precaution, and the caller has to pay the full charge for a 3-minute talk as well as the supplementary charge for the warning call even if the person he wants has meanwhile gone out and cannot be got to the telephone at all, or not without further delay, during which he is running up a bill for additional minutes of line-time.

History of "Personal" Calls in Relation to Standardisation

I have gone into this point in some detail (though, of course, by no means fully) not only because the personal call itself is, in my view, more than a mere accessory service of technical interest—it has, I think, a certain fundamental character in relation to the theoretical object of long-distance telephone service; but also because the history of the subject brings out very sharply some general administrative considerations with which I shall try to deal a little later in reference to standardisation. I will only say now that the *Préavis* system, which contrasts unfavourably with the personal call as worked in North America and in Scandinavia, was endorsed—as an optional facility—by the Telegraph Conference of 1925 (on which it is important to remember that America was not represented since the United States' Government does not adhere to the Telegraph Union), after much controversy which centred round the fundamental point I have emphasised, viz., whether the charge should begin to run as soon as the two *telephones* (after the preliminary warning) are connected over the international line, or not until the Administrations have put the two *people* into conversational touch. This action of the Conference constitutes, in my personal opinion, a classical telephone example of the evils of premature attempts at standardisation. Now that the transatlantic telephone service, in which the full person-to-person call is available, is open to most of the European countries, there is evidence of a desire to extend the better practice in Europe, and the Administrations will next year discuss on the Consultative Committee how to get over the practical difficulties which are undoubtedly involved in modifying the standardised *préavis* system. With good will on all sides, however, there are good hopes of overcoming the difficulty.

Scope of the International Telephone Regulations.

To return to the International Regulations, you will see that these comprise only rules which are to be found in a much more complete and elaborate form in the internal service regulations of most of the countries which have highly-developed telephone systems. The International Regulations are, in fact, only a skeleton scheme—the bare bones of a working system of international telephony—left to be clothed and nourished by the individual administrations with the help and advice of the C.C.I. This may at first sight seem a pity; but it is really not a bad thing at the present stage of European international telephony. It must be remembered that before the International Telegraph Conference of Paris in 1925, at which the present International Regulations were drawn up, there were practically no agreed international telephone regulations at all. Had the Conference attempted to lay down a detailed scheme of working, the effect would probably have been disastrous. Indeed, I think as it was they went too fast in certain respects—e.g., the *préavis* call to which I have just referred. The point is that the International Regulations are compulsory; all the European countries and many others are pledged to adopt them—unless, in a particular service, a country can, so to speak, contract out of some particular regulation by a special agreement with all the other countries concerned in that service. Obviously, any extensive practice of contracting out would destroy the whole object of the regulations, which is to secure the degree of uniformity necessary for efficiency. But, fortunately or unfortunately, different working methods on important points have grown up in the telephone systems of the leading countries of Europe—I mean leading in a telephonic sense—especially Scandinavia, Germany and Great Britain. The example I have already cited—that of the *préavis* call—is only one of many instances of this, of varying importance. I shall have occasion to cite others in dealing with rate-policy. Naturally each country is inclined to think its own way the best, and this is particularly the case in the more important points on which they differ; no country wants to alter its own system in important particulars, or to train its public to use a different system when speaking over the international lines from the one it is accustomed to at home. Indeed, in practice the leading countries definitely will not do this unless their system can be proved by practical experience to be inferior to another. The tactful silence of the International Regulations on some points and the alternative methods which they provide for in others leave a good deal of latitude for each country to go its own way—for the present. Meanwhile, information about the various practices and points of view is compared and collated on the C.C.I., the results being circulated in the form of advisory memoranda to all the countries; and there are already some signs of countries, which have hitherto adopted inferior methods (and for one reason or another this is the case in some respects in *every* country), being ready to learn in a scientific spirit from their neighbours. When we have all learned to subordinate national *amour-propre* to scientific efficiency in matters telephonic, the time will be ripe to extend the scope of the International Regulations, until they provide for uniformity on all those points on which uniformity is really desirable.

Uniformity and Standardisation.

THIS question of uniformity, as it is generally called on the Continent, or standardisation, which is the usual expression in England and America, is so fundamental that I think it is worth while considering it generally. I believe it is not altogether fanciful to see in the difference of use between the two words (although in practice they mean much the same thing)

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a historical difference in the point of view from which the common conception, so far as it applies to telephony, has been arrived at. On the Continent of Europe, telephony has in the past been much more closely associated with telegraphy than in America, and, indeed, in its earliest stages, the telephone service in Central Europe was grafted on to the pre-existing already highly-developed telegraph service. The German authorities claim, no doubt with justice, that this was a material help in financing the telephone service in its difficult early stages; and this is borne out by the fact that other countries have found it desirable to co-ordinate and link up their telephone service with their telegraph service at a later stage, to the mutual advantage of both. The telegraph service, of course, already had its uniform rules and regulations, and it is partly, though not wholly, this, I think, which has led to such great importance being attached by the Central European telephone authorities to providing at the earliest possible date a "Festregelung," i.e., a similarly uniform set of rules and regulations, for their telephone service. On the other hand, the early history of the telephone service in America and, to some extent, in this country and in Scandinavia, led to the growth of a number of different systems operated or owned by independent companies; and, when these were ultimately taken over by a single authority—after, in some places, a rather painful struggle, which has left behind it a slowly disappearing trail of evil consequences—the first problem was one of standardisation of plant; the conception of standardising operating methods and so on grew out of this. It must, however, be admitted that there is no English word for "Festregelung"!

Analysis of the Problem of Standardisation.—Plant, Operating and Rates.

I think it may be said generally that standardisation in its application to public utilities has three aspects, corresponding to the nature of the thing to be standardised: first, the standardisation of material (in the case of international telephony, of line plant, repeaters, &c.); secondly, the standardisation of what the French call "la manoeuvre" (in telephony, operating methods and practices generally); and, thirdly, the standardisation of charges to the public. As regards plant and operating methods, the advantages of standardisation are self-evident, though I think it must be conceded that standardisation, like most good things, carries with it certain corresponding drawbacks or, at least, dangers, which, especially in a rapidly-developing service, must be carefully guarded against. The obvious danger is that, partly owing to natural human inertia, as soon as anything is standardised on a large scale, it becomes more difficult to change it when improvements become necessary. An obvious example of the effect of this is the recent history of the temporary upset caused to the American automobile industry when Mr. Ford decided to change the type of his car. In regard to plant, this difficulty is mainly financial and it is common ground that it must be, and can be, got over; the secret of success being always to charge rates in a developing service which bring in a return sufficient to provide for development expenditure, including adequate provision for scrapping plant which has become obsolete on account of new inventions, &c., before it has reached the end of its normal life. This may involve a periodical adjustment of the depreciation accounts. To give an idea of the practical importance, at the present time, of making such provision on an adequate scale in European international telephony, I may mention that the present rate of growth of telephone traffic between this country and the Continent is in the neighbourhood of 40% a year; to cope with this growth it has been necessary to lay a new submarine cable on an average every year for the last 4 years; and technical progress has been so rapid that no two of these new cables (which contain many circuits each) are of the same type.

In regard to operating methods, while the case for some measure of standardisation is quite clear, it is not so overwhelming as in the case of plant. Some slight differences of operating practice at the two ends of the line do not necessarily injure the service. In any case, since each international call passes over a local line at each end and is handled by the local exchanges in the two countries which are being connected with each other, the complete standardisation of the operating of international calls would necessarily involve the re-standardisation on uniform lines of operating methods in the *internal* services of all the European countries. Now the difficulties in standardising operating are greater than in standardising plant, because you cannot train a new set of operators side by side with the old and suddenly switch over from a set of operators accustomed to the old method of working to a set trained in the new, which would be the analogue of what is commonly done when obsolete plant is being replaced. When operating methods are changed, there is likely, therefore, to be a period during which the service, to a certain extent, is upset. This trouble is analogous to the financial difficulty sometimes caused in changing over to standardised plant, but is not so easily met. The functioning of the existing machinery for standardising European operating methods can, I think, best be illustrated by a comparison of two representative views.

First, however, a general point about the third type of standardisation, that of rates. This stands on quite a different footing from the standardisation of plant or operating methods. The first requirement of a rate is that it should be suitably adjusted to the economic and financial conditions of the service, and whether the rate between two particular places A and B, which are 500 miles apart, is the same as the rate between C and D, which are also 500 miles apart, is obviously in itself quite a secondary consideration. For example, London is roughly 200 miles from Paris and about the same distance from Amsterdam. What the business man who has connexions in both places requires is a good service at reasonable rates; but he no more expects the charge for a call to Paris to be the same as the charge for a call to Amsterdam than he would expect to have to pay the same amount for a railway and steamer "through" ticket to these two places. If, therefore (as is, in fact, the case in the example I have chosen), the supply and demand conditions governing the telephone service on the two routes differ, there is no sufficient reason why the rate should not be settled in each case on its economic merits, whether or not the result is equality.

Nevertheless, it is obvious that *within an area not wholly separable for tarification purposes into parts bounded by co-terminous economic and political frontiers*, a system of international telephone rates in which the charges did not *roughly* correspond to distance would be open to criticism, as arbitrary, and might give rise to anomalies of the type which create local grievances. This is especially the case where you have irregularly-shaped land frontiers separating regions which have close economic ties—not an unknown condition in post-war Europe. To avoid such trouble it may be expedient to arrange international rates so that, apart from special conditions such as sea and mountain crossings, they correspond more closely with distances than the pure economics of the case could justify, as is usually done by national telephone authorities in fixing their internal rates. It is obviously a question of degree. Comparatively isolated countries like Great Britain find it both more difficult and less necessary to charge uniform rates (according to distance) on their foreign calls than do large Central European countries such as Germany, whose proportion of foreign to internal traffic is higher, and which naturally tend to look upon their foreign services more in the light of an extension of their inland service than as in a separate class by themselves. I will deal more fully with rates when I come to the finance of the international telephone services; but I wanted to outline the position in regard to this particular point of uniformity as it affects rates before comparing the views of two representative authorities on standardisation in relation to the general functions of the International Telegraph Conference and its Consultative Committee.

(To be continued.)

PROGRESS OF THE TELEPHONE SYSTEM.

THE following gives a brief review of the growth in the telephone system during the year 1928.

The total number of stations working in the Post Office system at Dec. 31, 1928, was 1,722,583, representing an increase of 124,409, or 7.8% for the year. The figures for London, England and Wales (excluding London), Scotland and Northern Ireland separately are as follows:—

	Total No. of Stations.			
	At Dec. 31. 1927.	*At Dec. 31,* 1928.	*Increase.*	*Increase* %.
London	565,590	614,183	48,593	8.6
England and Wales (excluding London)	865,634	931,803	66,169	7.6
Scotland	146,751	155,193	8,442	5.8
Northern Ireland	20,199	21,404	1,205	6.0

Residence rate installations at Dec. 31 last numbered 145,435 in London, and 229,906 in the Provinces, giving a total of 375,341. The net increase in residence rate installations during the year 1928 was 42,414, or 12.7%; the net increase in business exchange installations during the same period was 28,030, or 4.6%. At Dec. 31, 1928, the percentage of residence rate subscribers to the total exchange subscribers was 37.3%.

The total number of call offices working at Dec. 31, 1928, was 25,516, 5,505 of which were connected with London Exchanges and 20,011 with Provincial Exchanges. The increase for the year was 2,013, of which 1,825, or nearly 91%, were kiosk call offices. Kiosk call offices in the London telephone area numbered 1,214, and in the Provinces 4,807, as compared with 733 and 3,463 a year previously.

During the year 1928, 125 new rural exchanges were opened under the Rural Development Scheme of 1922, bringing the total number opened under the scheme up to 1,240. In addition to the 1,240 exchanges opened, there were at the end of the year a further 65 in course of construction.

The total number of exchanges working at Dec. 31, 1928, was 4,438, of which 2,944 serve rural areas.

The number of rural party-line stations at Dec. 31 last was 10,382, the net increase for the year being 208, or 2.0%.

The number of railway stations in rural areas connected with the telephone exchange system at Dec. 31, 1928, was 1,036, an increase of 182 on the total a year previously.

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The number of effective calls originated during 1928 is estimated at 1,238 millions, representing an increase of 87 millions, or 7.6% over the estimated total for 1927.

At the time of going to press, complete results for 1928 in respect of trunk calls were not available; but for the 12 months ended Nov. 30, the number of inland calls made was 107,335,024, representing an increase of 8,048,240, or 8.1% over the total for the 12 months ended Nov. 30, 1927. For the same period, the number of outgoing international calls was 414,182, compared with 317,915 in the 12 months ended Nov. 30, 1927, an increase of 96,267, or 30.3%.

Further progress was made during the month of January with the development of the local exchange system. New exchanges opened included the following:—

LONDON—Western (automatic), Hornchurch, Molesey, Sutton.

PROVINCES—Bath, Batheaston (automatic), Hythe.

And among the more important exchanges extended were:—

LONDON—Speedwell, Woolwich, Walthamstow.

PROVINCES—Cobham, Ibrox, Irvine, Leeds (automatic), Northwood, Swindon, Uxbridge, Winchester, Wokingham.

During the month the following additions to the main underground system were completed and brought into use:—

Leicester—Market Harborough cable
Middlesbrough—Saltburn cable
Sheffield—Chesterfield cable

while 70 new overhead trunk circuits were completed, and 82 additional circuits were provided by means of spare wires in underground cables.

REVIEWS.

"*Handwörterbuch des Elektrischen Fernmeldewesens.*" *Two vols.* (*Julius Springer, Berlin. 1st vol.*, 830 *pp.*, 1,319 *illustrations. 2nd vol.*, 903 *pp.*, 1,450 *illustrations. Price*, 192 *marks.*)

This work, which is modestly described as a dictionary of electrical communication—we have no exact equivalent for *Fernmeldewesen*—is in reality an exhaustive encyclopaedia of all questions relating to telegraphs, telephones and electrical signals generally, whether considered in their technical, historical, economic, juristic or statistical aspects. It is edited by Dr. Feyerabend, Dr. Heidecker, Dr. Breisig and Herr Kruckow, of the German Post Office, assisted by numerous postal officials, engineers and professors, whose names are well known to us as authorities on the subjects mentioned. The rapid progress of electrical communication in its various forms in recent years renders such a work as the present particularly welcome. It fills a gap in the ranks of books of reference and covers adequately the latest important developments in this many-sided branch of knowledge.

It is difficult to notice adequately so comprehensive a book within the compass of a brief review. We may, however, mention that the subjects *Fernamt*, *Fernkabel*, *Fernsprecher*, *Ferntisch*, &c. (trunk exchange, trunk cable, telephone, trunk board) occupy 100 double-column pages, and the section dealing with telephone cable systems includes excellent maps showing the trunk cable development of the principal European countries, as well as statistics and particulars of their electrical properties. Nearly 50 pages are devoted to wireless and the same number to telegraphy, without counting the numerous references throughout the two volumes to special branches of these subjects under their appropriate alphabetical headings.

Under the geographical headings (England, Frankreich, Neiderlande, &c.) are given a general historical account of the telegraph and telephone systems, with the latest tariffs, economic results and statistics up to 1924 or later. (There are also special articles dealing with the questions of tariff policy and statistics in themselves.)

Telegraph and telephone apparatus in all its branches is fully dealt with from the technical standpoint, and methods of working and all aspects of telephone and telegraph practice are fully treated. German practice is, naturally enough, chiefly drawn upon for illustration. Bell, Hughes, Baudot, Murray, Morse, Pupin, Krarup, to name only a few of the goodly company of inventors and improvers, appear in their turn in these pages, which contain not only a description of their works but a brief biographical note of their lives. From this it will be gathered that this book, besides being an encyclopaedia, forms also a biographical dictionary; it will serve, too, as an up-to-date technological dictionary, for all the German alphabetical headings are followed by their English and French equivalents. The volumes are handsomely bound and excellently illustrated. They constitute a work of reference which no scientific library should be without, containing as they do authoritative information on all subjects connected with electrical communications from "A operators" down to "Zugfunk" (railway-train wireless).

"*Civil Service Arts Magazine.*" (*Published by the Civil Service Arts Council, Treasury Chambers, Whitehall. 6d. quarterly.*)

We welcome the appearance of this new addition to the ever-growing ranks of periodicals connected with the service. The Arts should certainly possess their own medium of expression, and it is this medium which our new contemporary seeks to provide. The first issue is largely concerned with the drama and photography, but there are sections devoted to art, music and literature. It is a healthy sign that the contributors to this number come from all ranks of the staff, from porters and telegraphists upwards.

We note with special interest the proposal of a correspondent for the formation of a C.S. Three Arts Club, of which we hope more will be heard.

We wish the new venture all possible success.

CHRISTMAS TELEGRAPH TRAFFIC IN SOUTH AFRICA.

A NOTEWORTHY feature of the South African telegraphs is the huge traffic on Christmas Eve, due to the popular custom of sending greetings by wire.

This season the volume was larger than ever, and the following figures, relative to the transactions at the Central Telegraph Office, Capetown, for the six working days ending Dec. 24 in each of the last three years, show the continuous growth of this traffic, which for 1928 as compared with 1927 was almost phenomenal:—

December, 1926.		*December*, 1927.		*December*, 1928.	
Sat., 18th ...	12,419	Mon., 19th...	18,235	Tues., 18th ...	25,725
Mon., 20th ...	19,007	Tues., 20th ...	16,043	Wed., 19th ...	22,659
Tues., 21st ...	17,538	Wed., 21st...	17,198	Thurs., 20th	21,342
Wed., 22nd ...	17,232	Thurs., 22nd	19,284	Fri., 21st ...	22,401
Thurs., 23rd	22,041	Fri., 23rd ...	28,374	Sat., 22nd ...	26,103
Fri., 24th ...	42,703	Sat., 24th ...	39,491	Mon., 24th ...	63,365
Total ...	130,940	Total ...	138,625	Total ...	181,595

The total of 63,365 messages for Dec. 24, 1928, is the greatest ever recorded in Capetown and South Africa, and exceeds the previous highest—that of Christmas Eve, 1925—by some 16,000. The number of telegrams handled on Dec. 24 is almost four times the normal, and the figures quoted for the one office, which may be taken as typical of the whole South African service, illustrate what is a very heavy volume of traffic for a comparatively small community.

E. E.

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JOHN LEE.

[John Lee's interest in economic and administrative questions is well known to our readers. We feel sure that they will welcome the following article which is reprinted by kind permission of Sir Henry Bunbury and of the Editor of *Public Administration*.]

SUNDAY evening in the Common Room at Balliol. Standing at the fireside, John Lee, summing up to an intent audience of men and women the discussions on the varied problems of industrial management which they had met to consider. For over an hour he held them, and no attention flagged. In dead earnest, yet with the racy humour which was part of the man constantly breaking out and never far away. Occasional references, duly announced, to the "little buke" in which he had jotted down his notes of the discussions; for the rest, an easy, conversational, closely reasoned and critical analysis of three days of lecture and debate. If the Chairman's function on that occasion was to stimulate thought and interest among men and women whose daily task lay in doing things rather than in thinking about them, John Lee fulfilled his part that evening supremely well.

A dreary chamber at St. Martin-le-Grand, known, not inappropriately, as the Accumulation Room. The annual meeting of the Post Office Ambulance Corps. High officials make speeches, good of intention, a little solemn in manner and dull in matter, as civil servants' speeches—heaven forgive us—are apt to be. John Lee rises to propose some resolution or other. He begins, and ends, by telling a story which, he says, he has just been reading: it is the story of the Good Samaritan. Gradually the parable assumes a Post Office setting: Priest and Levite become Controller and Superintendent—busy and conscientious men with many official duties needing their attention; and so on to the end. This was art, and something more than art.

One more episode. Lee as Chairman of the most difficult Committee of the difficult International Telegraph Conference at Paris in 1925, representing Britain, if not *contra mundum*, at any rate *contra Europam*. The French of international conferences aspires to rather than achieves the language of France: Lee could lay but a poor claim even to "conference French." He conducted the proceedings, it is reported, in a fluent but hybrid lingo in which his mother tongue, openly or thinly disguised, contributed to his sentences as occasion demanded. With his imperfect knowledge the effort of following the discussion must have been even more severe. Yet, under this handicap, he held and ruled session after session an expert and critical assembly, and got his way, not so much by what he said as by the way in which he said it, and by the force of his personality. Men could not but like him and trust him.

Incidents such as these may help to give some idea of the man who was one of the creators of the Institute and the first Editor of its Journal, whose foundations he laid. He was, it has been said, a born journalist. He had for a good many years plied the craft in his spare time, and loved it. He read widely. His first essays were in literary journalism and novel-writing. But behind the delight in word and phrase was a restless, inquiring mind which insisted on finding out what made the wheels go round and why they should sometimes go round only with effort and friction. He soon developed an interest in commercial economics, which gradually crystallized more and more round the problems of industrial administration and personnel management. It was no doubt his intensely sympathetic nature and his passion for justice that guided his attention so definitely to the human side of industrial and official organisation. He would always speak of the psychology of a situation, and he loved to explain the gradual development of the "scientific management" movement in America out of, and far beyond, its early conception of a purely mechanical efficiency. Perhaps the best papers out of several which, in addition to numerous reviews, he wrote for the Journal, were his "Personnel questions in Government enterprises and large-scale industries" (April, 1927), and a short paper on "Security," in the first number. In both the psychological interest dominates.

It must have been these same qualities that inspired his interest in the formation of the Institute—the passion for knowing how things are done and might be better done, and the desire to extend to others engaged in dull and repetitive work the enlargement of interest which he had, though hardly, won for himself; for he began his working life as a telegraphist before he was sixteen. As far back as 1919 he took an active part in the organisation by the Society of Civil Servants of its first series of lectures on administrative subjects, and in 1920 proposed an essay competition and a silver medal in connexion with them. In 1922 he was made Chairman of a Sub-Committee promoted by the interested associations to consider the educational work which an Institute of Public Administration, if formed, could undertake. When in 1923 the Institute was founded, he became the first Editor of its Journal, and in spite of the many activities which were then crowding upon him, he held the post for the first year of its life, when it was clear that competent hands were ready to take it over. His editorial notes in the first number gave an admirable statement of the scope and principle of such a publication. He served on the Council from the start and was Chairman in 1925-26.

Lee was an incorrigible optimist: even the warnings given by his severe illness in 1926 and the permanent damage to his constitution that it left behind did not daunt him. Yet the news that he must abandon some of the activities to which he had dearly looked forward, and for which his retirement would provide the opportunity, was a heavy blow. He met it with his usual gay courage, but those who knew him best realised all that it meant to him. Editing, occasional writing (in *The Times Engineering Supplement*, *Economist*, and *Church Times*), and his new business interests remained, and into these he threw all, and perhaps more than all, the energy that he was permitted to use, till the end came suddenly, and with plans and aspirations that he still cherished unfulfilled.

The value of his contributions to administrative science lay perhaps chiefly in the ideas thrown out by his singularly fertile and stimulating mind. He was indeed a little impatient of the pursuit of detail, as a man of his qualities of intellect and character is apt to be. His influence on others, both in the departmental world and in the progressive industrial circles in which he moved, was his greatest achievement. To act as guide and interpreter was his métier. His output in the last few years before his illness was astonishing—"Plain Economics," "The Principles of Industrial Welfare," "Industrial Organisation," "Management," "An Introduction to Industrial Administration," "Christian Social Duty," and, still more recently, the editorship of the Dictionary of Industrial Administration. All were written with the same dominant motive, that of inspiring thought and inquiry, of pointing to impending developments, of challenging traditional notions which seemed to him to have outlived their day. He was interested in public administration, but perhaps rather more in the light which it might throw on, and in its relation to, the problems of industrial administration, than in its principles and problems in themselves. It may be that he felt the official machine (how he would have hated the word!) a little too rigid and unreceptive for his eager and idealist habit of mind. Moreover, his incorrigible optimism made him apt sometimes to see facts as he would like them to be rather than as they were. But he was a master of his craft, a leader of men, and he left his mark on the administration of his own department. And he had a pride in the service which he never disguised.

Of Lee in his more personal relations it is difficult to speak. "Everything that he touched," says *The Times Trade and Engineering Supplement*, "he illumined with his own generous and contemplative nature." He had a singular charm of manner, a native gift of eloquence, a ready understanding, and a fund of humour that made him the most delightful of company. His boyish zest in life remained to the end: and if weighty and measured speech and sternly regulated thought are the marks of maturity, John Lee never quite grew up. But he leaves a gap that will not readily be filled and a memory that will be cherished in affectionate regard by all who knew him.

H. N. B.

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GLASGOW NOTES ON MR. ARCHIBALD'S IMPRESSIONS OF AMERICAN TELEGRAPHS.

A GLASGOW correspondent writes:

That there was something to learn from American telegraph practice, and much to avoid, was the feeling of the large audience of telegraphists which listened to Mr. Archibald on the 15th ultimo. Glasgow telegraphists are independent and critical, but just as the proverbial Scot is supposed to look at two sides of his pennies, so are they prepared to listen to both sides of a question. Reports preceding Mr. Archibald's visit had not been favourable. One large centre had written of propaganda. Within a few minutes the lecturer had convinced his audience that he had no motive other than to pass on his recently acquired knowledge, and, when he concluded, the audience showed their appreciation of his efforts in no half-hearted manner. As was to be expected the hard-headed Scots were not prepared to accept some of the statements made: the extraordinary line stability provoked questions, questions arising from answers, and even cross-examination, but Mr. Archibald while cautious enough not to claim that everything he had been told was gospel truth, assured the hecklers that he had told them just what he had been told. That stability of lines and apparatus was of first importance to the Glasgow telegraphist was very evident, fully 90% of the questions bearing on it. The others were directed to the beautiful ladies who accepted telegrams at the big hotels over the pond. Why had the lecturer not shown a slide of them? The questioner was very disappointed, and so on. Lt.-Col. Westbury, Postmaster-Surveyor, presided, and wisely ruled as unfair several questions which might have involved Mr. Archibald in controversy.

CENTRAL TELEGRAPH OFFICE NOTES.

Promotions.—Messrs. W. K. Ware and R. P. Mitchell, Overseers to Assistant Superintendents; Miss H. M. Rimington, Supervisor to Supervisor (Higher Grade).

"F" Division Re-union.—Past and present members of the "F" Division spent a very pleasant evening on Jan. 18 celebrating the annual re-union of friends.

C.T.O. Veterans.—The annual re-union will be held on Mar. 16 at Andertons Hotel.

The City of London Male Voice Choir.—A concert has been arranged for Mar. 18, S.S.U. Concert Hall, Old Bailey, at 8 p.m. This choir is practically composed of all Central Telegraph Office men and has won a number of successes at the London musical festivals.

Influenza Epidemic.—Sickness is taking a heavy toll of the C.T.O. staff. On Feb. 19 a total of 466 officers, all ranks (excluding uniform staff) were absent out of a live force of 3,170. The 450 total has been exceeded on 6 consecutive days. The normal figure during the winter months is generally round about 150.

The "Centels" Operatic, Dramatic, and Orchestral Club.—"The Yeoman of the Guard" was presented at Cripplegate Institute at the end of January. A pleasing performance, denoting all-round efficiency, was given and quite a number of congratulatory critiques have appeared in service journals.

On Friday, Mar. 15, the Dramatic Section are presenting a performance of "The Happy Ending," by Ian Hay, at Cripplegate Institute. Tickets may be obtained through the Honorary Secretary, G. Dunthorne, C.T.O.

The Club is completing its programme for 1929-1930, full particulars of which will be given next month.

Honorary members will be welcomed, the annual subscription being 12*s.* 6*d.*, which may be made by instalments entitling a member to two tickets for any performance during the season. Past members of the C.T.O. are eligible for membership.

Sport.—Centels Sport Association.—The annual Dance will be held on April 12 at Victoria Hall, Bloomsbury. Tickets price 3*s.* may be obtained from the Honorary Secretary, D. W. Jones.

The Football Section visited Brighton and Horsham in January on a short football tour. Matches were played against both Post Office teams, the Centels proving victors in both cases.

Library.—The Annual Report and Balance Sheet for the year ended Dec. 31, 1929, once more denotes a satisfactory progress. There are at present 808 members and 2,902 books. There is no doubt that the Library is extremely popular. All classes are catered for—Highbrow to Edgar Wallace. The subscriptions are very reasonable, 1*s.* 6*d.* a quarter for one book, 2*s.* 6*d.* for two books, &c. Why go to any of the well-known circulating libraries when you can be catered for in your own office?

LONDON ENGINEERING DISTRICT NOTES.

Presentations.—Transfer of Mr. H. C. Gray, Assist. Engineer from South East Internal to Centre Internal.

A pleasant little ceremony, at which Mr. A. J. McNicol, the Sectional Engineer presided, was held recently at North Side, Wandsworth Common, when Mr. H. C. Gray, Assistant Engineer, was the recipient of a chiming clock, as a memento of his sojourn in the South West Internal Engineering Section, and as an expression of the esteem and affection which was felt for him by his colleagues of all ranks. Mr. Gray has been transferred to the Centre Internal Section after service in the South West Internal Section since its inception on April 1, 1924.

Representatives of all ranks in the Internal Section, External Section, and Technical Section, were present, and it was very difficult to confine the little ceremony within the limits desired because of the evidently urgent wish of so many to express their appreciation of Mr. Gray and their regret that he had to leave. Mr. Gray gracefully and effectively replied to all the accusations made against him.

Transfer of Mr. A. F. Lewis, Chief Inspector, from Centre Internal to Internal North East.

Mr. Edgerton, Sectional Engineer, presided at a gathering of the friends and colleagues of Mr. A. F. Lewis, to bid farewell to Mr. Lewis on his transfer. Mr. Edgerton said that it gave him great pleasure on behalf of those present to present Mr. Lewis with a barometer and thermometer in token of their esteem and goodwill. Mr. Edgerton also referred to the high esteem in which Mr. Lewis is held.

Mr. Lewis, in replying, expressed his regret at leaving so many old friends and wished them continued success.

Exchange Construction.—The following new exchanges were opened during the month of February:—

Exchange.	*Type.*	*Date.*
Pollards (Norbury)	Manual	Feb. 27.
Valentine (Ilford)	Manual	Feb. 28.

The Epsom manual board was transferred from Streatham to Sutton on Feb. 20.

GLASGOW TELEPHONE NOTES.

A SENSE of humour is one of nature's choicest gifts, and when this is unconsciously expressed it sometimes attains heights of brilliance that make the premeditated effort pale and anaemic by comparison.

Many moons ago a complaint was lodged by certain members of the Glasgow Night Operating Staff that the cleaning and dusting of their exchange affected their ability to render good and efficient service, because of the germ and dust laden atmosphere, causing them to cough and sneeze and so presumably to depart from the authorised operating expressions.

A zealous traffic officer was deputed to investigate and in due course he reported that he had visited the exchange and observed the conditions of which complaint had been made. The gem of the essay was to the effect that while he was present there were:—

"Two coughs (one per man) and one sneeze."

It is supposed that no further official action was taken but as the coughs and the sneeze were actual transactions it is to be hoped that in the following quarterly statistical record these were duly valued, the equating "E" factor applied, and the appropriate allowance made for dropped and end positions!!

On Tuesday, Jan. 22, the staff, or many of them, foregathered for music and dancing at the Locarno, Glasgow. A very enjoyable evening was spent, all present contributing to the mutual pleasure of the company. Amongst others we had Colonel and Mrs. Westbury, Mr. and Mrs. Coombs, Mr. and Mrs. J. Law and Mr. and Mrs. E. J. Johnson. The arrangements were in the capable hands of Miss H. B. Mowat, which will indicate all there is need to tell as to effectiveness and all round satisfaction.

On Explanations.

"You are requested to furnish at once your explanation as to:" (P.O. Form P. 18B). "I'm kind of weak on explanations, partner. You figure it out your own way" (Brand). "Explanations usually are mistaken tactics" (Chisholm). "Explanations only lead to deceiving one or the other or both" (Goethe). "Thinner than a lawyer's explanation." "Lots of things is better just stated, an' not mussed up tryin' to be explained"(Wason). "Who explains, accuses" (French adage). "Facts are more important than explanations. Explanations may disprove facts" (Adams).

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Maintaining Strowger

Progressive Assemb

In the progressive assembly line sh
while every facility is utilized to sp
assembly process, each switch is subje
careful scrutiny of inspectors, who will
unless it satisfies the most rigid and
standards of construction, quality and p

STROWGER

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utomatic Supremacy—

Switch Manufacture

THE accompanying illustration shows one of the switch assembly lines in the factories of Automatic Electric Inc., where selector and connector switches start at one end as bare frames and emerge at the other as practically complete switches. The various component parts which are mounted on the frame are fed to the operators by means of gravity rollers from assembly tables, where they in turn have been assembled. Because of the specialization of each worker upon one particular operation, this method insures greater uniformity of product together with increased speed of production, resulting in lowered costs.

This method of progressive assembly, which has been applied with great success in the automobile industry, has been used in various phases of Strowger Automatic equipment manufacture for many years with the highest satisfaction. It represents but one of the many improved production methods which have been worked out over a period of years by the efficiency experts of Automatic Electric Inc., who always have had as their object the ultimate lowering of cost to the purchaser, in addition to constantly maintaining every element of quality and performance for which this equipment is noted.

This is one of a series of advertisements illustrating the exacting care exercised in the production of Strowger Automatic telephone equipment, which is thus kept constantly in advance of the telephone art.

Automatic Electric Inc.

Factory and General Offices: 1033 W. Van Buren St., Chicago, U. S. A.

Sales and Service Offices in All Principal Cities

EXPORT DISTRIBUTORS

For Australasia—Automatic Telephones, Ltd.
Elsewhere—Automatic Electric Company, Ltd.

AUTOMATIC

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The
Telegraph and Telephone Journal.

PUBLISHED MONTHLY IN THE INTERESTS OF THE TELEGRAPH AND TELEPHONE SERVICE, UNDER THE PATRONAGE OF THE POSTMASTER-GENERAL.

Editing and Organising Committee - - - J. STUART JONES. W. D. SHARP. J. F. STIRLING. W. A. VALENTINE. J. W. WISSENDEN.

Managing Editor - - - W. H. GUNSTON.

NOTICES.

As the object of the JOURNAL *is the interchange of information on all subjects affecting the Telegraph and Telephone Service, the Managing Editor will be glad to consider contributions, and all communications together with photographs, diagrams, or other illustrations, should be addressed to him at the G.P.O. North, London, E.C.*1. *The Managing Editor will not be responsible for any manuscripts which he finds himself unable to use, but he will take the utmost care to return such manuscripts as promptly as possible. Photographs illustrating accepted articles will be returned if desired.*

VOL. XV. MARCH, 1929. No. 168.

THE POST OFFICE GUIDE.

'WORKING copies of the Guide should be amended accordingly.' So every week the order goes forth; and in every city, town, village, and hamlet (at any rate, all hamlets that possess a Post Office) in England, Wales, Scotland, Northern Ireland, the Isle of Man, and the Channel Islands, it is recorded that deferred and letter-telegrams for Brunei may be in the Malayan language, or that telegrams for Maracaibo "via Trinidad and Wireless" are subject to delay. It may be that at Machynlleth (Mont.) they have never heard of Brunei; it is doubtful whether even in Manchester the counter-clerk would recognize Malay when he saw it; and one may question whether even at that fountain-head of telegraphic knowledge, the Central Telegraph Office, anyone could say with certainty whether a telegram in Malay consisted wholly of plain language and did not contain number-groups in excess of one-third of the words in the text. But if any sender presents a deferred telegram for Brunei in the Malayan language and that telegram is refused, or if he is allowed to cherish optimism about the Trinidad wireless route to Maracaibo, woe betide the counter-clerk!

But surely, the critic may argue, the counter-clerk, with many more serious things to consider, cannot be expected to keep such useless information in his head? The answer is twofold. First, the knowledge is not quite useless—if it were, there would be no need to burden even the Guide with it. Telegrams for Brunei and Maracaibo may happen very rarely, but they do happen; and it is the necessity for inserting in the Guide information that is almost useless but not quite that makes the Guide such a dull record. Secondly, the counter-clerk is not, thank Heaven, required to keep such knowledge in his head; the most that even an exacting Department requires is that he should know where to find it.

How far, then, does the Guide succeed in setting forth its information concisely and conveniently? That is a question that the counter-clerk can best answer; but one may suspect that the counter-clerk, whose misfortune it is to have to refer frequently to the "Table of Charges for Imperial and Foreign Telegrams," might be extremely scathing in his criticism of its anonymous authors. One can only plead in their defence that although the rates for overseas telegrams become more complicated every day, the table in which they are set forth is less complicated than it used to be, and less complicated than in many similar publications in foreign countries. If any critic thinks the work is badly done, let him try to re-arrange the matter for himself before he voices his criticisms.

The main difficulty is that the Telegraph Companies, and indeed the Department itself, continue to shower benefits on the public in the shape of new "services" (that poor overworked word!), and every new service is an additional complication to the counter-clerk. In the aggregate they are possibly not an unmixed blessing even to the public; every big business firm nowadays has a special "Cabling Section," thus confessing that the intricacies of the subject are beyond the comprehension of the amateur. Only a few weeks ago a reduced scale of charges was introduced for night-letter-telegrams to North America; the point at which the reduced scale begins to apply depends on the number of words and varies according to the telegraph "zone" of the office of destination. Altogether the system does not lend itself to very simple expression; and as we go to press there are rumours of further complications still to come. Before very long we shall be faced with the problem of setting forth the new tariffs for code-telegrams.

One thing must be steadily borne in mind. The growing complexity of the overseas telegraph service does bring with it substantial gains to the public; it makes it easier for British trade to capture foreign markets, it makes it possible for not too wealthy people to use the system as a means of social and commercial intercourse. It is arguable that still greater advantages would be gained by a drastic simplification of the whole system of tariffs; but to achieve this object at this stage, while conserving for the public all their present gains, would be a herculean task. In the meantime the counter-clerk can do much to guide the sender through the labyrinth.

We have written of the Post Office Guide from a very narrow angle. But the part may serve to illustrate the whole. We have tried to show that, while the work of those who have to use the Guide is difficult, the work of those who compose it is not altogether easy. Though we gain small thanks from the public for the intricate "correction-slips" that are issued in our endeavours to serve them, let us at least commiserate one another for our joint sufferings in a noble cause.

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COMEDY AND TRAGEDY.

SOME stories have recently been current in the Press—they are more or less perennial—of the abuse of the telephone by practical jokers and by persons of more nefarious character whose aim is to decoy people from their houses in order that these may be entered and robbed with comparative impunity. Such abuses are, of course, no more peculiar to the telephone than to any other system of communication. The benefits of the telephone, the telegraph, the express train, and the motor-car fall, like the rain, equally on the just and the unjust. It is a kind of left-handed testimony to their popularity that their aid is readily sought by the criminal and the cad in their unsocial exploits. If, however, the housebreaker has sometimes been known to turn the telephone to his advantage, it is more often enlisted against him, and is, in general, one of the best forms of burglary insurance which the householder can possess.

American journals often favour us with exciting accounts of the ready-witted action of telephone operators who get an indistinct or half completed signal from some subscriber in distress, and, guessing that something dramatic is toward, dispatch the police to the scene of action in the nick of time. It was possibly under the influence of some such stirring tale that a Paris telephonist recently exercised what the *Daily Telegraph*, in its account of the incident, describes as a "too vivid imagination." He was on duty, we are told, at the Mercadet Exchange, one of the busiest in the city, when he received a call at four a.m. from a subscriber in the Rue Caulaincourt. He took up the receiver, but heard nothing at first. Then a sound suggesting a violent commotion struck his ear. This was followed by what he believed to be a woman's cry of anguish, lasting several seconds. The lamp at the exchange was extinguished. The person making the call had hung up the receiver.

The telephonist was convinced that a drama was being enacted, and that a woman, finding herself in danger, had as a last resource, called for help by telephone. All was, therefore, proceeding on classic lines. He immediately got into communication with the police station in the Passage Tourlaque and reported what he had heard, at the same time expressing his fears that a woman was being done to death.

A few minutes later two cyclist policemen called at a flat in the Rue Caulaincourt, and were received by a man in a jovial humour. They found a jovial company. Then the tenant of the flat explained what had happened. One of the guests had upset the telephone instrument, and, when it fell to the floor, a young woman broke into a shriek of laughter which the imagination of the telephonist transformed into a cry of distress.

Several morals might be drawn from this little story. One is that it is but a step from the sublime to the ridiculous, or, shall we say, from the tragic to the comic, and that a commendable promptitude which would be rewarded with official encomiums in one set of circumstances only earns unfeeling laughter in another. For the action of the telephonist was undoubtedly praiseworthy and was intended to forestall a tragedy. Despite its ludicrous *dénouement*, it was conceived in the proper spirit of public zeal. Too vivid an imagination is better than dull-witted indifference or a timid repugnance to making oneself look foolish. Who can say how many tragedies are enacted because those who might have averted them are either too slow to grasp the situation, or else hesitate to interfere from a dread of making a blunder.

HIC ET UBIQUE.

TELEPHONE service between this country and Poland was inaugurated on Feb. 15. It is confined at present to communication between London and Warsaw.

Telephonic communication between Paris and Buenos Aires was officially inaugurated on Jan. 30 by M. Briand, who held a conversation with the Foreign Minister of the Argentine Republic.

The charge, says the Central News, will be £6 5*s*. for a three-minute conversation, and two guineas for each additional minute.

Under new arrangements which lately came into operation, all telephone exchanges throughout France with more than 200 subscribers are now provided with both night and day services. No fewer than 170 exchanges are affected by the new order, bringing the total provided with a 24-hour service up to over 300 exchanges.

We also learn from the Central News that telephone rates in France are to be raised in consequence of the deficit shown in the past. Government officials are of the opinion that the telephone system should be made self-supporting as in Britain and the United States.

According to the *Southwark Diocesan Gazette* one of the clergy attached to St. John's, East Dulwich, had something of a shock a few weeks ago. He was at home feeling exceedingly ill. The doorbell rang, and as there was no one else in the house to answer he dragged himself downstairs. In front of him stood a burly British workman, who said in sepulchral tones, "I've come to put you underground." The clergyman gave a start and then stammered "I—I—I—beg your pardon." "Can I start at once," said the visitor, "I'm from the Post Office to put your telephone line underground." "Oh, certainly," said the priest, "I thought you were a gravedigger."

The circumstance that the new exchange at Kenton is to be called "Wordsworth" has moved a poet in the *Evening Standard* to write some verses concluding with the following happy lines :—

After the customary wait
I heard an answer to my call,
And murmured "Are you Wordsworth 8?"
A pleasant voice, but one so small,
It might have come from highest Heaven,
Replied, "Wrong number. We are 7."

There is trouble in Chicago because some of the hotels charge 10 cents to their guests for a 5 cent call. The Illinois Commerce Commission point out that by their regulations and the Chicago City ordinance it is forbidden to subscribers or lessees to charge more than 5 cents for a single local message. The hotel people explain that they only charge 5 cents for the calls—the other 5 cents is for "service." They evidently have their own ideas of the great American ideal—"Service."

According to the annual report of the Polish Administration for 1927 there were 79,122 km. of telegraph wire in use at the end of that year. 14,547,203 telegrams were handled of which 1,935,426 were international messages. The total number of telephone subscribers was 111,721, and of telephones 146,420. Of the latter 82,585 belong to the State system and 63,835 to the telephone company's system.

NOTE.

WE hope to publish in our next issue Mr. G. T. Archibald's paper, "Impressions of the American Telegraph Systems," which he has read to several gatherings of the provincial staff since giving it in London.

Several interesting articles are held over this month owing to the pressure on our space.

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COMMISSION CONTROL OF PUBLIC UTILITY SERVICES.*

BY A. J. WALDEGRAVE, ESQ., M.B.E.

ONE of our legislators, a few months ago, when pressed to give a definition in circumstances which were difficult, escaped from his difficulty by saying that although he could not define an elephant he knew one when he saw it. It is perhaps unnecessary to go much further in defining a public utility service—or, adopting the abbreviation of the Americans, a "public utility" simply; we all recognise railways, water supply, gas, electricity, telegraphs, telephones, &c., as services of this nature. It is worth while, however, considering a little closely the distinctive feature which marks off these services from the many other services which people render to one another on a commercial basis and which make up the main sum of business life. The public utility is characterised by the fact that it combines the two features of being a necessity of civilised life and of tending inevitably to become a monopoly.

The large-scale system of interdependence which we call modern civilisation could not continue without the existence of services of this kind as the very skeleton of its structure. Excellent types of human life may be possible without water-mains or railways or telephones, but they must differ greatly from life as we know it in our present environment. The public utility is the link which the individual cannot forge for himself, yet which, under modern conditions, is essential to his life as a member of the community. And not only the individual but every social group and commercial company is dependent on the services of this nature; contact with them is vital.

But "necessity" is not sufficient as a distinguishing mark of the public utility. Linen collars and silk stockings, for example, may be necessities of civilisation but the organisation which exists for the provision of them, and the frequent renewal of them, does not rank as a public utility service. Another element must enter for this purpose, viz., the element of monopoly. Or, perhaps I should say, of tendency to monopolistic conditions; for the services which are now recognised as public utilities did not spring into existence as complete monopolies and have not in all cases even to-day attained the position of secure and unassailable monopoly.

Consider the railways. These have a long history of competitive activity, a history which, as we shall see presently, has left its mark on the development of the system of Commission control, which is the subject of this paper. And a'though the rivalry between the great main lines in Great Britain has now, under the grouping arrangement, been refined into a sort of pictorial poster competition, a new phase of competition has been entered upon with the development of motor transport. In spite, however, of competition, there has always been a large element of monopoly in the position of the railways.

Similarly with the other public utilities. Gas and electricity have been subject to competition, the one by that of the other. Trams have had to face the attack of motor-buses; telegraphs have yielded much ground to telephones, and cables have been forced to come to terms with wireless (terms, the discussion of which would, I apprehend, be ruled out of order by the Chairman). Water, perhaps, has had no rivals (for we can scarcely count the efforts of brewers and distillers) and stands out as the type, *par excellence*, of a public utility, combining the two elements of necessity and monopoly. But even in the case of the several other services mentioned, the existence of the competition of substitutes or of potential supplanters does not alter the fact that they are essentially monopolistic—always in tendency and often in actual operation.

This monopolistic character is sometimes created by law—as in the case of the postal service, which, although we may find some difficulty in realizing it, is not a natural monopoly but an artificial one. In general, however, the public utility is a natural monopoly. A very clear instance is that of the telephones. The practical impossibility of the existence of more than one telephone system in a locality has been demonstrated by history, and the monopoly which exists to-day in this country has rather been appropriated than created by the State.

The case of telegraphs is not quite so clear. We were reminded in the paper read at the last meeting of this Society that in America rival telegraph systems do in fact exist and flourish side by side. Whether they will continue to do so remains to be seen. That they are able to live in competition with one another at all is because telegraphs do not exhibit in quite so marked a degree as other public utilities, the factor which in general enables such services to occupy a position of monopoly. That factor, giving the public utility its pull, is the operation of the service by means of a large fixed plant, tied to the locality in which the utility operates. In the case of a telegraph system, the plant, essential as it is, and spectacularly prominent though it may be, is *relatively* a small factor in the cost of running the business. But in the case of telephones, of railways, of electricity supply and other utilities, the plant costs in relation to other costs are so high that competition, which involves duplication of the plant, is difficult to institute and maintain. Moreover, in some cases there is physically not room for more than one enterprise, as, for example, in the case of a tramway, or in that of a water company, where there is only one practicable source of supply.

* Paper read to the Post Office Telephone and Telegraph Society of London.

Even where there is no physical restraint on duplication or multiplication of services it may be uneconomic to have more than one service in the field, and in those circumstances the tendency to monopoly is bound, more or less quickly, to assert itself.

It is important, however, to realise that, given due safeguards, it is to the interest of the users of the service that monopoly should exist. During the development of the modern conveniences which are now called public utilities it has become increasingly evident that too high a price may be paid for the benefits of competition and that it may be of advantage, even to the consumer, to eliminate the overlapping and the wastefulness of rival systems and to let the control of the service be in the hands of one concern.

The advantages of monopoly are not, however, likely to accrue to the consumer unless steps are taken to secure his interests—which are naturally in conflict with those of the owners of the monopoly. There are, it is true, incentives operating to induce even the monopolist to cheapen service in order to attract as much as possible of the patronage of the consumer, but if the service which he supplies is a necessity he may find it easier to make profits by providing an indifferent service at exorbitant rates than by providing an efficient service at low rates. Under monopolistic conditions, with the making of profits as the primary object, there can be no guarantee that the conflict of interests between the exploiting company and the user of the service will be equitably adjusted by the mere operation of economic forces.

Various methods have been devised of avoiding the conflict or of reconciling the interests of the antagonists. One such method, which is in operation to a considerable extent in this country, is that of public ownership, either by the State or by the local authority. It is not the purpose of this paper to enter upon, or to provoke, a discussion of the principle of nationalisation of public services. As members of this Society, we are all engaged in trying to promote the higher efficiency of a State-owned service, but that is on professional and not on political grounds. Whether our special position is calculated to make us better or worse judges of the general political issue I should not like to say. Successful treatment of the problem by the nationalisation method is clearly dependent on the existence of a high level of political intelligence and probity in a community, and it is scarcely necessary for us this evening to discuss such interesting questions as to whether the British public gets a better or a worse service than it deserves, or whether the distrust of State-ownership in America is a reflection on the quality of American political institutions. Let it suffice for the moment that public ownership is one way of dealing with monopolistic conditions.

Another method of dealing with those conditions is by setting up an authority like the Port of London Authority or the Metropolitan Water Board, which does not dispossess the holders of the stock but which eliminates the speculative element from the enterprise and fixes rates with consideration, to the best of its judgment, of the various interests concerned. So far as incentives to enterprise and efficient management go, an authority of this kind is in much the same position as a Government Department, except that it is free from direct political interference.

In this connexion, it should not be overlooked that the mere apprehension of being displaced by a State or municipal service or an *ad hoc* authority, may be a deterrent against extortion and inefficiency on the part of a public-utility company.

Apart from such apprehension, attempts at restraint on the abuse of its privileges by a public-utility company have, in this country, usually taken the form of provisions in the Act of Parliament authorising its operations or in the licence from the local authority enabling it to work; and it has not been uncommon for these provisions to contain restrictions on the rates which may be charged. That is to say, maximum rates have been fixed. But in these cases the maximum has generally turned out to be too high to constitute any effective check on abuse of the monopolistic conditions. It is in the nature of things that a maximum rate should be higher than is really necessary; and a new invention or a development of technique may soon render it quite ridiculous.

In the gas industry a system of controlling rates in the interest of the consumer by means of a sliding-scale system has been introduced and this system is in operation in the case of most of the larger companies. The scale usually adopted is that called the London Sliding Scale, which was introduced in 1875, providing that for every penny of reduction below the standard price the gas company might pay ¼% above the standard dividend.

The principle of the sliding-scale system is that there should be an automatic division of good results between the company and the consumer; and in recent years there have been several notable developments of the idea of applying this principle to more complex utilities than the gas industry.

Under the London Electricity Acts of 1925 provision has been made for application of the sliding-scale principle to the supply of electricity. Standard prices are to be fixed, being finally determined by the Electricity Commissioners, if necessary, and if lower prices are actually charged, giving rise to what is called "consumers' benefit," a sum equal to one-sixth of this consumers' benefit may be added to the dividend payable by the Company.

In the Railway Act of 1921, which reorganised the railway system of this country, the net revenue of the year 1913 was taken as a standard and it was provided that one-fifth of any profit earned in excess of that standard might be added to it, while rates should be reduced so as to aim at eliminating the other four-fifths in future years. If, however, the profits grew further the process would be repeated and the standard net revenue again increased;

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and so on. So far, as is well known, the companies have not yet succeeded in earning up to the 1913 standard.

The same principle of sharing results is embodied in an arrangement made a few months ago for a new steamer service to the Highlands and Islands of Scotland, but with the omission of any provision for an increasing standard of profits. In this case, half the profits above 6% are to be paid to the steamship company and the other half paid into a contingencies fund. This fund will be used to level up the earnings in lean years, and every two years the rates charged are to be reconsidered and an effort made to adjust them so that the balance in the fund will be kept at a certain comparatively low level. A more recent case still is that of the Imperial Communications Company, which is to take over the Beam Service and the Imperial Cable Service of the Post Office, as well as the service of the Pacific Cable Board. In this case an amount has been fixed as the standard revenue, which will yield approximately 6% on the assessed value of the capital assets of the company. If this standard is exceeded, one-half of the excess will be taken by the Company and the other half will be devoted to the betterment of the service to the public, presumably, in ordinary course, by reduction of rates. But the detailed arrangements are still under discussion. When these arrangements are completed they will constitute the latest attempt to reconcile by means of the sharing principle the interests of the consumer with those of a company in the carrying on of a monopolistic service.

In the United Stated the problem of the public utility has been approached in a distinctive way and the history of the efforts to find a satisfactory solution does not run parallel with the corresponding efforts in this country. In order to understand the direction which they have taken it is necessary to know something of the political constitution of the half-continent which we call the United States. In particular, it is necessary to appreciate the fact that the separate States in uniting into a federation, retained a very large measure of autonomy, of which they are very jealous. It is not easy for us in England to realise that the division into separate States is much more analogous to the division of the British Empire into Dominions than it is to the division of England into counties. Such, however, is the case. Moreover, it is necessary to remember that when the federation was formed the rights of the individual citizen, in whatever State he might reside, were in certain respects defined and guaranteed by a written constitution. One of the provisions of the constitution is that "no person shall be deprived of life, liberty or property without due process of law; nor shall private property be taken for public use without just compensation"; and another provision is that "no State shall pass any law impairing the obligation of contracts."

The inviolability of the constitution is guaranteed by the Supreme Court, sitting in Washington, to which appeal can be made against any breach of the constitution, either by one of the States or by the central Government itself. Each State has its own legislature and its own courts of law and, except in matters where, under the constitution, it has definitely surrendered its powers, exercises self-government.

Across this vast territory of America, this huge network of semi-independent States with their unique constitutional and judicial system, came the nineteenth-century stream of expanding population, bringing with it, besides certain habits and institutions which are of no particular interest to us this evening, two features on which we must concentrate our attention viz., rapidly developing railways and the English common law.

The development of railways was the very life-blood of the invading civilisation. Agriculture, which was the prime interest of the new communities was dependent upon railways in a supreme degree, and every inducement was given to promoters and speculators to push ahead with their schemes. Railway communication at any price was the order of the day. Lines in all directions, with much overlapping and competition, were projected and constructed, and for a time no regard was paid to the dangers of exploitation and monopoly on the one hand or to those of unnecessary and expensive duplication on the other. But after a while farmers and traders, who constituted the bulk of the community, began to realise that all was not well with the railway system on which their business life depended. And many of them were stung by the loss of savings which, during the boom, they had invested in ill-considered or mismanaged railway schemes. (It is worthy of note that 70% of the railways in the United States have, in the course of their development, gone through the process of liquidation).

Complaints were loud of extortionate rates and of discriminatory rates. The latter kind of complaint, i.e., of discriminatory rates, arose mainly from the fact that at points where a railway company was subject to competition it instituted lower rates than at points where it held a monopoly. The farmers at the latter points saw their rivals getting their crops to market on more favourable terms, but no remedy was available. There was discrimination against districts as well as against individuals, with corresponding patches of discontent.

It might be supposed that the public at the points where lower rates prevailed because of competition would be happy; but they did not long remain without grievances. For naturally a disposition among the competing lines towards working agreements and more or less close amalgamation set in, and the flame of indignation against the railways was fanned by this tendency towards combination.

Out of the general discontent grew up a movement for control of the abuses connected with the railways, and this movement expressed itself in the appointment by various States of commissions to deal with the matter. At first these commissions were of an investigatory and advisory character only: they were given power to prosecute enquiries into the management of the companies and to publish the information; and reliance was placed on the force of public opinion in bringing about reform. Soon, however, some of the Western States, with traditions no doubt of the virtue of encouraging the pianist by shooting at him, began to turn these advisory commissions into mandatory ones, with power to fix rates and to impose conditions of service.

As soon as this happened there arose the question of the legality of such interference with the freedom of the companies to conduct their business according to their own wishes; and so began a long course of litigation on the subject of the control of public utilities, which, as we shall see, is not finished yet. The issue of the right of the States to interfere at all with the rates charged by a public utility company was fought out in what is known as the Munn case in 1876. The State of Illinois had ordered a reduction in the rates charged by a company in Chicago for the storage of grain in the great warehouses, called elevators, which were an adjunct of the railway system connecting the West with the East. The case went through to the Supreme Court and it was held by the court that the relations of traders with the company came within the scope of the Common Law, which from time immemorial had recognised that some sorts of business are in a special way "affected with a public interest" and if carried on at all must be carried on with due regard to that public interest. The occupation of common carrier was a business of this kind, and the railways must accept the liability to Government regulation which their special character as common carriers involved. It is interesting to note that telegraph and telephone companies have since been formally declared to be common carriers and to come under this ruling.

Although the legal right of regulation was thus established there was for a time a reaction against mandatory proceedings on the part of the commissions and a hesitation to harass the companies, which were in the throes of a financial crisis. But the tendency towards regulation reasserted itself and the struggle was again carried to the courts. The case *Smyth* v. *Ames* is the next landmark in the history of regulation of public utilities in the United States. The case reached the Supreme Court in 1898, and in its judgment the court pronounced the formula which thereafter became the foundation principle of all legislation and administration in connexion with the control of public utilities, viz., that these utilities are entitled to "a fair return on a fair value"—that, fully that, but nothing more.

In giving its judgment the court said: " . . . the original cost of construction, the amount expended in permanent improvements, the amount and market value of its bonds and stock, the present as compared with the original cost of construction, the probable earning capacity of the company under particular rates prescribed by statute, and the sum required to pay operating expenses . . . are to be given such weight as may be just and right in each case. We do not say that there may not be other matters to be regarded in estimating the value of the property. What the company is entitled to ask is a fair return on the value of that which it employs for the public convenience. On the other hand, what the public is entitled to demand is that no more be exacted from it for the use of a public highway than the services rendered by it are reasonably worth."

It was a substantial gain to the movement for regulation to have it established that the formula, "a fair return on a fair value," was to govern the relations between the public and the companies, and that there was nothing unconstitutional in the provision of administrative machinery to ensure the application of this standard; it was not fully realised at first how ambiguous and how difficult of application this simple principle is, and what an amount of dispute was possible on the two questions, "What *is* a fair value," and "What *is* a fair return on it." The development of the commission system went on and the commission took definitely the mandatory form.

For a good many years now, commissions have been established in all the 48 states of the Union except the small state of Delaware; and their method of functioning is similar throughout the country, though they differ in the extent to which the appointments are influenced by political considerations and in the quality of their personnel.

Primarily the commissions represent the public interest and are only semi-judicial in character, i.e., they are concerned to defend the public against the encroachments of the companies, the assumption being that in general these are well able to look after themselves, particularly as they are able, if they dissent from a decision of the Commission, to appeal to the courts on the ground that the decision amounts to confiscation. For that is the constitutional procedure. The order of the commission may be appealed against, first in the state courts, and, if that is not successful, in the Supreme Court at Washington, as confiscatory and therefore unconstitutional. The courts do not themselves fix rates. The commissions employ a staff of engineers and accountants to advise them on cases, and do not adopt the purely judicial attitude of listening to experts called by the respective sides and then—well, doing whatever it is that judges do when faced with diametrically opposite views from equally eminent experts.

In theory the commissions have the right to initiate enquiries, but in practice the enquiry originates either in complaints from the public or in an application by a company. From whichever side the application comes, the investigation is carried out in public and with all the forms of law. Evidence is taken with all the solemnity of an ordinary court of law and is available if there is an appeal and the case actually goes forward to the courts. It seems a cumbrous and expensive procedure, but at any rate it ensures full publicity, and that is an important consideration, perhaps the vital consideration, where the issue lies between public interest and powerful private interest.

(To be continued.)

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CORRESPONDENCE.

HOW TO IMPROVE THE TELEGRAPH SERVICE.

TO THE EDITOR OF "THE TELEGRAPH AND TELEPHONE JOURNAL."

Sir,—As a Postmaster at a small office for over 30 years, I suggest the primary cause of the decay in matters telegraphic is the cost of the messages.

When telegrams were sixpence and postage one penny, people did not hesitate to send telegrams as they do now, they reckoned the cost of the telegram at fivepence. It was easy and cheap to send telegrams, and the service was popular.

The telephone has largely supplanted the telegraph owing to the fact that it puts people into direct touch, thereby saving time, especially on short distance calls.

Long-distance calls are made only when the business is very urgent, and these are not always satisfactory, as there are considerable delays and annoyances in getting effective connexions. Telegraphs and telephones are not, or should not be, antagonistic services.

There is room and necessity for both, and each should be adjusted to fit into the other so that the best might be obtained from them.

The telegraph plant exists as an effective communicating machine. To scrap it would be wasteful in the highest degree.

Telegraphs and telephones are run as separate departments. I suggest they should be under one control. The tendency of dual control is to lose a sense of the relative values of each undertaking.

A large expense falls on telegraphs, as staffs have to be kept to meet the business which may or may not come along.

It would be more profitable to keep the staffs employed on cheaper telegrams.

A sixpenny rate might not be justified all through the day, but as in telephones, the rates could be varied according to the busy or slack periods and the distances.

I venture the opinion there would be no loss if the service was made cheaper as the increased turnover would balance the position.

Only an experiment for a period can prove whether there would be loss or gain from a reduction. It would be worth while to try.—I am, Yours faithfully,

"SMALL OFFICER."

TO THE EDITOR OF "THE TELEGRAPH AND TELEPHONE JOURNAL."

Dear Sir,—I should like to submit the following comments apropos of the "Technical," "Operating" and "Traffic" sections of the article by "A C.T.O. Telegraphist."

The Teleprinter No. 3 has a speed of 60 words per minute, or 3,600 words per hour. This is equal to 257 messages simplex and 514 messages duplex, where the average telegram is 14 words per message, excluding preamble.

If, therefore, traffic existed and there was no need to time, check, and record receipt of the telegram an ideal circuit would carry an enormous volume of work per hour.

We have, however, recently heard that totals of 80 to 100 messages are possible with a certain amount of concentrated effort, and this presents the fact that such totals represent only in actual "paid time" 20 and 27 minutes, respectively, of each hour. The remaining period of the hour appears to be a liberal margin for the non-manipulative part of the work in connexion with each message.

I would, however, like to add that the speed of the Teleprinter, 60 words a minute, is high with very long circuits and that if it were dropped to 50 words per minute to suit, say, a cable 300 miles long, greater stability would result with no reduction in speed of disposal of traffic. Keep the speed of the Teleprinter as high as possible with short lines, but reduce it as the circuit lengthens beyond, say, 200 miles. I believe the result would increase stability.

The writer remembers that it was difficult to fix a higher speed than 50 words per minute each way at Wheatstone Duplex on a 300-mile cable loop, and that the Morkrum instrument speeded at 40 words per minute was decidedly more stable on that circuit than a Teleprinter No. 3 at 60 words per minute.

Regarding "Traffic," motor omnibus services have also reduced the short-distance telegram, just as they have affected short railway journeys in the provinces, and to-day the percentage of racing telegrams is very small in the afternoons as compared with 6 or 8 years ago. The racing and Press traffic filled the afternoon, whereas to-day we find little of either, and no canvassing will bring that work back again.

What, then, can be done? So long as loss in connexion with telegrams exists, increase of traffic will increase that loss. It is, therefore, up to telegraphists, if they can, to suggest a means of reducing the existing loss. Handling more and more telegrams per minute or hour, either by machine or other effort, would no doubt be the ideal solution.—Yours faithfully,

Carlisle, Feb. 12. CANDID.

THE AUTOMATIC MULTIPLEX.

TO THE EDITOR OF "THE TELEGRAPH AND TELEPHONE JOURNAL."

Dear Sir,—Dislocations due to travel have prevented me from seeing until now the letter of A.C.B. about the Automatic Multiplex in your issue of December, 1928. Like the author of that letter, I am keen about historical accuracy in matters telegraphic, and I notice that some of A.C.B.'s corrections need further correction.

The famous old pessimist, Ecclesiastes, the preacher, said: "There is no new thing under the sun. Is there anything whereof it may be said, See, this is new? It hath been already of old time, which was before us." In one respect at least Ecclesiastes was wrong. *Success* is always new, and it is customary to give credit to the man who succeeds, and not to those who fail. Quite a number of people attempted to make an automatic multiplex, especially in America, but they all failed, just as the Baudot Automatic Multiplex failed, because certain elements of success were not supplied by them, and were supplied in the Murray Multiplex. To mention just one, there is the start and stop for the Murray tape transmitter, automatic as well as manual, so arranged as to stop between the transmission of letters. That was a new and essential printing telegraph device. The Baudot machine made no interlocking provision, manual or automatic, for starting or stopping the transmitter at the right instant. How could an automatic multiplex be successful without that element? There was also the application of the phonic drive to the Murray Multiplex distributors, an important feature, and a number of practical details about which it is not necessary to trouble your readers; but I may mention the importance of speed in the keyboard perforator. The Murray keyboard perforator is exceedingly rapid. The Baudot keyboard perforator was not speedy. It was also clumsy and badly designed and punched square holes. The transmitter was a sliding contact device, with no practical durability about it. If the Baudot Automatic Multiplex was successful, why didn't the French Government adopt it, and why was it not adopted by the British Post Office after the purchase of a set by Colonel Booth on behalf of his administration in 1907?

A.C.B. says that the Baudot set purchased for the Post Office in 1907 was shown to me soon afterwards, with the result that I abandoned my perforator, which had a feed of half an inch per letter and was used on my high-speed automatic system, and adopted the method of cross perforations with a feed of one-tenth of an inch, as in the French instrument.

That statement is not correct. I retained my lengthwise perforated tape until 1912, five years afterwards, when I sold my American rights to the Western Union. My object in retaining the lengthwise perforated tape was to enable the same tape to be used on both the Murray Automatic and Murray Multiplex. In 1912, when the Western Union bought my American Multiplex rights, the Postal Telegraph Company held the American rights to my automatic system, and in these circumstances I recommended the Western Union to use cross perforated tape, as there was nothing to be gained in that case by adhering to the more expensive lengthwise perforated tape. There was nothing new about cross perforated tape, even for automatic printing telegraphs, nor were the dimensions new. Several American inventors used almost identically the same cross perforated tape before me, and so did the Scottish inventor, A. J. Forbes, at a still earlier date. In all these cases the Wheatstone tape dimensions seem to have been adopted. I took the Wheatstone as my standard, and not the Baudot tape. Indeed, I think A.C.B. is also in error in stating that the Baudot tape was spaced 10 to the inch. The Baudot tape had square holes and it was considerably wider than the Murray Multiplex tape, which is now standard practically everywhere.

It is an historical fact that the Automatic Multiplex was not a success until my inventions were applied to it. Then it became a very great success. I have testimony to that effect from the Western Union, and if A.C.B.'s official duties had permitted him to accompany the G.P.O. Telegraph Commission of Enquiry that went to America last year, he would have seen just how great that success has been. It is only fair to the Western Union engineers to say that they added many other important improvements to the automatic multiplex, more than sufficient to justify the title of the Western Union Multiplex; but it was the Murray Multiplex inventions that first made the Automatic Multiplex a practical success.

If, as A.C.B. asserts, the French Telegraph Service must be given the honour of being the pioneers of automatic multiplex working, why is it that the French Telegraph Service is now giving orders for Murray Multiplex keyboard perforators and tape transmitters, and is not using the Baudot keyboard perforator and tape transmitter made by Carpentier in 1907?

If *first success* justifies the claim to pioneership, then Mr. Stuart Jones was correct in saying that the Murray Multiplex was "The pioneer of automatic multiplex." In the Law Courts in Great Britain and the United States and other countries, one of the criteria of invention is first success, and it is a matter of telegraph history that the Murray Multiplex was the first successful Automatic Multiplex. In precisely the same way the Morkrum Teletype was the first successful pioneer of the start-stop printers. The Teletype succeeded because it contained certain inventive elements that were lacking in its predecessors. It is generally agreed that the Teletype was the pioneer start-stop printer, and the Murray Multiplex is in exactly the same position in regard to the automatic features. Success is the legal and logical and commonsense criterion of pioneership.

A.C.B. states that "the American authorities" obtained the requisite Baudot apparatus for America from Elliott Bros., the obvious insinuation by A.C.B. being that it was from the Baudot system that the Western Union developed their multiplex. I can only characterise that insinuat on by saying

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that it is not only untrue but unfriendly, and it gives me an unpleasant impression that there is a desire on the part of A.C.B. not so much to ensure historical accuracy as to gratify personal malice by belittling my work. The Western Union bought two Baudot distributors, but did not get satisfactory working from them until, on my advice, they applied the phonic drive; then they went well. No "American authorities," to my knowledge, experimented with more Baudot apparatus than these two distributors, and the Western Union afterwards developed their own distributor on entirely different lines from the Baudot, but retained the vital phonic motor drive.

A.C.B. raises an issue of more general interest to telegraph engineers when he says that the permanent duplex arrangement for the Baudot devised by the British Post Office was also adopted by the Americans as well as by Mr. Murray. I am afraid this is a case in which Ecclesiastes was right. Of course Ecclesiastes and I may both be wrong, and duplexing the Baudot may have involved some new inventive element. To settle the question, perhaps A.C.B. will inform the telegraph world exactly what Colonel Booth invented when he "duplexed the Baudot"? Would he also explain how it is possible to duplex any printing telegraph apparatus whatever? I had an impression that duplexing applied only to the telegraph *line* and to the main line relay, and not to the *apparatus*, and that duplexing the line had been done already of old time. Also I have an *Ahnung*, or presentiment, or clairvoyant impression, that the Rowland Multiplex was working commercially with the duplex balance, and that I saw it so working, long before Colonel Booth "duplexed the Baudot."

Apparently A.C.B. thinks I couldn't invent a door knob. I return thanks for the compliment, and by way of proving that other people besides D.M. differ from A.C.B., I may, perhaps, be allowed to make the following quotation from a letter I received from Mr. G. M. Yorke, Vice-President for Engineering, Western Union Telegraph Company, when I retired from business in 1925:—

"This may be a good time to express again our appreciation of the invaluable help which you and your principles were to us in getting started on our Multiplex career in the right way. By getting started in the right way and at the right time, the Western Union was able to carry its war burden with credit, where otherwise I fear there would have been most serious embarrassment."

Some of these days, if I get time, I may write my autobiography. If so, I shall have more space and more latitude for expressing my views about inventing doorknobs and duplexing the Baudot.—Yours faithfully,

DONALD MURRAY.

[NOTE.—We have shown this letter to our correspondent "A.C.B.," who wishes us to make it clear that, in correcting what he regarded as misstatements of fact in Mr. Stuart Jones's paper, he did not intend to make any attack on Mr. Murray.—ED. *T. & T. Journal.*]

MANCHESTER NOTES.

Lectures.

ON Jan. 23 and 24 a series of two lectures on "Automatic Telephony" were given by Mr. J. L. Parry (Traffic Superintendent). The lectures were part of the scheme to afford some elementary knowledge of "Automatics" to the Contract Officers and Clerical Staff, and on each occasion an audience of approximately 140 attended and were well rewarded by an excellent exposition, illustrated by lantern slides, of the principles, not only of the "straight" system but also of the "Director" system, which is to be installed in the Manchester District, the first provincial district to be catered for in this respect.

That such instructive lectures were appreciated by members of the staff, who have little opportunity of becoming acquainted with the latest developments in telephony, was evinced by the numerous questions put to the lecturer after the reading of the papers and the eagerness displayed at the demonstration of automatic apparatus.

At the end of the second lecture, Mr. Godfrey (Staff Officer), deputising for Mr. Whitelaw, the District Manager, who had to fulfil another engagement, proposed a very hearty vote of thanks to Mr. Parry for the admirable lecture he had given and for his very clear explanations in response to the questions asked, and this was carried by acclamation. Mr. Parry replied in suitable terms.

Resignations.

Miss M. James, Writing Assistant, who resigned the service on Jan. 26, for the purpose of entering a convent, was presented by the Staff of the Fees Division with a suitcase.

Miss D. E. Moorhouse left the service on Feb. 9 on the occasion of her marriage, which took place on the 11th instant. A very handsome canteen of stainless cutlery, subscribed for by the staff of the District Manager's Office, was presented to her and many beautiful gifts from her special friends amongst the staff were also given to her.

TELEGRAPHIC MEMORABILIA.

ABYSSINIA.—Reuter's agency states that it is understood that the Government has advertised for tenders for the erection of a large international radio-telegraph station at Addis Ababa.

ARGENTINA.—Reuter's Trade Service at Buenos Aires informs us that the International Telephone & Telegraph Corporation has made formal application to the Minister of Posts and Telegraphs for permission to establish a wireless-telephone service between Buenos Aires and New York.

AUSTRALIA.—It is reported, says *The Electrical Review*, that the British General Electric Co., Ltd., has secured a contract for the telegraphic transmission of pictures between Melbourne and Sydney, the first experiment of its kind in Australia.

The same reliable authority also states that an agreement has been reached by the Commonwealth Government and the Western Australian Farmers' Broadcasting Co. for the continuation of the "A" class station in Perth, 6WF, under Government ownership. It was known that the company was anxious to sell its interest in the enterprise, which had proved a very unprofitable venture, but the terms under which the Government had agreed to take it over have not been disclosed. The Postmaster-General (Mr. W. G. Gibson) said negotiations for taking over "A" class stations in the other States were being undertaken on behalf of the Government by the Broadcasting Advisory Committee.

AUSTRIA.—According to *World-Radio*, at the end of 1928 the total number of receiving licences in force was 325,200. There were 17,283 cessations, but by Jan. 14, 1929, the total was 317,382.

BELGIUM.—It is announced from Brussels that the company known as Les Fils Isolés Belges, of Brussels, has entered into arrangements with native producers of cables and insulated wires for the sole sale of a part of their production. The firms concerned are the S.A. des Ateliers de Constructions Electriques de Charleroi, the Société Belge pour la Fabrication des Cables et Fils Electriques, of Brussels, the S.A. Manufacture de Cables Electriques et de Caoutchouc, of Eupen, the S.A. Cablériés de Seneffe, of Seneffe, and the S.A. Cablériés et Corderies de Hainaut, of Dour.

From the same capital city, but through Reuter's agency, it is also announced that a new wireless station is to be opened in the Belgian Congo. Arrangements are under way to set up a station for broadcasting talks and musical programmes. The Belgian Colonial Minister has given his assent to the scheme, and it is now being submitted to the Governor-General of the Congo for his consideration. The initiator of the scheme is Mr. Goebel.

BRITISH EAST AFRICA.—The *Electrician* draws attention to the following facts regarding broadcasting in British East Africa and the possible trade opportunities in this special direction, thus: "The Office of H.M. Trade Commissioner in East Africa reports that the programmes of the British East African Broadcasting Co., Ltd., comprise transmissions on 33.5 metres (1 kw.), with a range of approximately 1,000 miles, and also on 400 metres (4 kw.), with a range of approximately 60 miles. Broadcasting will take place each evening simultaneously. It is estimated that at least 2,000 sets will be sold within the next twelve months in the area served by the station. The most popular set will probably be the three-valve short-wave set with a loudspeaker, designed to pick up British, American and Dutch broadcasting services in addition to the local station, and adapted also to receive the 400-metres station. A smaller set of two valves with headphones will probably be demanded as a cheaper alternative, and crystal sets for use with the 400-metre station may also be in demand. British firms interested may obtain the names of likely importers of wireless apparatus on application to the Department of Overseas Trade, 35, Old Queen Street, London, S.W.1."

CANADA.—From a report of the High Commissioner for Canada in London we learn that more than a quarter of a million Canadians using receiving sets had paid the Government tax of one dollar up to the end of November, 1928, an increase of 17,000 compared with the end of November, 1927. According to the *Board of Trade Journal*, the returns indicate that there are 226,240 private receiving licences, although it is believed that more than 100,000 sets exist on which no licence has been issued. The revenue from the issue of licences is devoted by the Department of Marine and Fisheries to the improvement of radio services, about a score of radio interference investigation cars being in use.

CHILI.—A company has recently been formed in Santiago, with a capital of £75,000, to introduce wireless picture telegraphy into Chile.

CHINA.—By the time these lines are printed the commercial wireless service between New York and Shanghai, via the Philippine Islands, will have been inaugurated by the Radio Corporation of America, says a reliable informant.

DUTCH EAST INDIES.—The commercial agent at Batavia (Mr. H. A. N. Bluett) has informed H.M. Department of Overseas Trade of a report that the Nederlandsch-Indische Radio-Omroep Mattschappij (Netherlands Indian Broadcasting Co.) will shortly be formed. The company will be established in Holland, and will be represented locally by two delegates. The capital required is f. 600,000, of which f. 300,000 has been promised by Messrs. Maintz & Co., Radio-Holland, and the Philips group in equal shares. The broadcasting station will be built in the neighbourhood of Batavia; it is estimated that it will cost f.400,000.

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According to Reuter's agent in Amsterdam, the wireless-telegraph traffic between Holland and the Dutch East Indies (direct and via America) yielded during the fourth quarter of 1928, so far as the Dutch portion of the revenue is concerned, roughly 462,800 florins, compared with 328,000 florins during the corresponding period of the previous year; figures for the whole year 1928 were 1,663,950 florins, compared with 1,107,000 florins in 1927, being an increase of over half-a-million florins, or just over £40,000.

FRANCE.—With reference to the suspension of broadcasting from the Eiffel Tower after 9 p.m. in order to avoid interference with Daventry (5XX), a statement has been made by the French Under-Secretary of Posts and Telegraphs. This statement is to the effect that the Eiffel Tower changed its wavelength from 2,650 metres to 1,484 metres, and the Under-Secretariat admits in the communiqué issued that numerous protests have been received since the beginning of the year. The change was, however, inevitable, since the big liners are now utilising waves exceeding 2,000 metres. It was for this reason that the Washington Conference of 1927 provided that the major European wavelengths should be confined to a band between 1,340 and 1,875 metres. The Administration also points out that the new length has given satisfaction in Southern Algeria, the Levant and Alsace. The forthcoming European conference in Prague may find a satisfactory solution.

The well-known firm of Messrs. Schneider & Co., of Le Creusot, France, have recently secured the French rights in the new system of signalling developed by the Submarine Signal Corporation, of New York, says *The Electrical Review*. It is stated that the system enables acoustic signals to be transmitted and received from below the surface of the sea, also enabling the direction and distance of the source of the signals to be determined.

GERMANY.—The number of subscribers increased during the final quarter of 1928 by 301,314, bringing the total to 2,635,567 on Jan. 1, 1929. The increase during 1928 was 625,725. Bavaria, in spite of its four transmitters, perhaps owing to the scattered peasant population, has not been able to boast of any great number of listeners, having only about six million inhabitants. According to *World-Radio*, they total now exactly 174,102, against slightly over 151,000 on Oct. 1. Every listener canvassing a new listener and giving his name and address to a Bavarian radio paper obtains a premium of 2 marks, the cost of a month's licence in Germany (24*s.* a year). The simultaneous transmitter at Berlin-East, which uses the same wavelength as Stettin and Magdeburg, has begun experimental transmissions.

International Consultative Committee.—Meetings of the International Consulting Committees of Telegraph and of Long-distance Telephone Communication are to be held in Berlin from June 10 to 17 next.

GREAT BRITAIN.—The British Post Office statistics show that last year damage to telegraph and telephone lines by gales during the year cost the Department £400,000, which figure was above the average, owing to the exceptionally severe weather. During the last four years £44,000,000 has been spent on capital account for the development of the telephone service with the result that five-sixths of the telephone wires of the country are now laid underground.

The British Post Office commercial accounts for the year ended Mar. 31, 1928, show that the cash receipts from wireless licences amounted to £1,234,898, from which was deducted £154,362 for expenses of management and £1,427 contributed towards the cost of converting certain spark marine telegraph stations. From the sum of £1,079,109 which remained, £824,237 was paid to the British Broadcasting Corporation and the balance to the Exchequer. The expenditure incurred in respect of the change of coast stations to the interrupted-continuous-wave system was the first instalment of a total expenditure estimated at £20,000, necessitated by an agreement reached at the Washington International Radio-Telegraph Convention in 1927.

The Association of British Chambers of Commerce recently addressed an inquiry to the Postmaster-General relative to the action which had been taken by the Post Office upon the recommendations contained in the report of Sir Hardman Lever's Committee on the inland telegraph service. In his reply, the Postmaster-General states, according to the *Daily Telegraph*, that five recommendations are still under consideration. Arrangements have been made which will facilitate more frequent adjustments of staff to traffic in the larger telegraph offices. The telegraph supervising force in London and the larger provincial post offices has been reduced in the last two years by about 160 posts. The replacement of Morse by teleprinter apparatus is being carried out as rapidly as possible, regard being had to the rate at which teleprinter apparatus can be manufactured and telegraph operators can be trained to work it. The question of concentration of traffic is being pursued, and circuits unnecessary for traffic purposes are being suspended.

Hull.—The B.B.C. announces that the Hull station has been included among those stations transmitting on the national common wavelength of 288.5 metres (1,040 kilohertz), which is ultimately to be adopted by practically all British relay stations; the change took place on Feb. 1. As the Hull station formally transmitted on a frequency of 1,020 kilohertz (294.1 metres), the change is so slight that very little, if any, readjustment of receiving apparatus should be necessary, as doubtless our reader-listeners have already discovered.

Kinnaird Head.—The automatic wireless beacon at Kinnaird Head, Fraserburgh, which has a range of a hundred miles, has been completed, and the first tests have been successfully carried out by representatives of the Marconi Company. The station may be identified by the call signal MMK, and it operates on a 1,000-metres wavelength. All the machinery is duplicated, and power is obtained from two 5-h.p. kerosene engines and storage batteries.

The General Post Office, as is generally known in radio circles, is gradually replacing the spark wireless telegraphy sets at its coastal stations with interrupted-continuous-wave instruments, which have already been installed at Seaforth (near Liverpool), Niton (Isle of Wight), North Foreland and Mablethorpe. This year the change will be made at Cullercoats, Northumberland, Fishguard and Wick.

London.—Wireless Pictures.—Some Interesting Examples.—On the 16th of last month the prospectus of a company was issued in London. New York financial interests were anxious to participate, but it was necessary for the prospectus also to be advertised in New York. The only way the prospectus could be got through in time for the next day's newspapers in America was by means of one of the wireless-photographic processes, in this case that of the Marconi Company. Within four hours the prospectus in photographic form was in the hands of the New York addressee.

Only a few days previously the New York correspondent of the *Daily Telegraph* had cabled the following:—

"By means of a blue print diagram sent by wireless telegraphy to New York from London, a new rudder is being constructed here for the disabled British steamer *Silver Maple*.

"The vessel is now being towed to Bermuda, and the new rudder will be shipped to her this week. To have sent the diagram by mail would have entailed a delay of eight days."

The *Daily News*, which itself utilises picture-telegraphy periodically, states that the "Fultograph system is at the moment undergoing tests by the British Air Ministry." The same authority adds:—

"The Meteorological Office hope to be able to adapt it for sending complete weather charts by wireless."

As these lines go to press the decision of the Air Ministry is still awaited. Meanwhile it is understood that "the apparatus has also been placed at the disposal of the War Office for tests."

The wireless correspondent of the *Daily Telegraph* also gives the following forecast of what looks like another "merger." He writes:—

"I understand on good authority that Wireless Pictures, Ltd. (the Fultograph system) and the Baird Television Co. may shortly join forces. Conversations have recently taken place between representatives of the respective boards of directors with a view to a merger. It is hoped that under this new arrangement the B.B.C. will continue to transmit Fultograph still pictures, in accordance with the contract signed with Wireless Pictures (1928) Ltd., last year.

"It is possible that another test of the Baird system will be made shortly. It will not be so much a technical test as one to obtain views as to the present value of television with regard to occasional television transmissions in the near future from B.B.C. stations."

HOLLAND.—The Radio Council, says *The Electrical Review*, recently formed by the Dutch Government for the purpose of exercising general control over all wireless telegraphy and telephony in the country has held its first meeting. The Minister of Waterstaat, under whose department the Council will work, pointed out that as yet broadcasting in Holland was not in a satisfactory state, and many difficult problems would have to be solved by the Council.

ISLE OF MAN.—Sir William Mitchell-Thomson (Postmaster-General) has stated that if no unforeseen difficulties arose the work of laying the submarine telephone cable between the Isle of Man and the mainland would be completed in July next.

JAMAICA.—Reuter's Kingston Agency reports that Mr. Russell F. Pike, of the Radio Corporation of America, intends to form a wireless broadcasting corporation to be controlled and operated by Jamaica and also that the capital shall be raised on the island. He has received assurances of support from 12,000 Jamaicans of good standing.

JUGO-SLAVIA.—The 28 rooms in the building of the Academy of Sciences (Nauka) at Belgrade which are to house the new broadcasting company are nearly ready for occupation, and the Marconi apparatus from England is already being placed in position. Dr. Braun, formerly in the service of Ravag, is a director of the new company, and its general manager; tests will begin on Feb. 1 with 6 kw. energy, and the two aerial masts, 80 ft. high, are already erected on the roof of the premises. Hitherto South Slavia has been very ill-provided with broadcasting stations, that at Zagreb is only of 0.7 kw., but, according to *World-Radio*, Ljubljana (Laibach) is nearly ready now, with its Telefunken plant of 2.5 kw. and masts 400 ft. high.

Vienna reports that the Belgrade Government intends to lease all the telephone and telegraph services to private companies.

LUXEMBURG.—The Grand Duchy now possesses a broadcasting station Radio-Luxemburg, which can, it is reported, be heard throughout the whole State. At present the sole resources of the station are derived from the subscriptions of members of the Association of Friends of the T.S.F. for the development of broadcasting in the Duchy, says *World-Radio*; owing to the limited income, it is not possible to give daily transmissions.

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NEW ZEALAND.—Through Reuter's Wellington Agency we are informed that the number of wireless listeners' licences issued in New Zealand last year was 42,801, which is an increase of 4,616 over the figure for the previous year.

ROUMANIA.—The ban that has existed since 1925 on the use of transmitting and receiving stations within a zone of 30 km. of the frontier has been removed. According to the *Wireless World*, after a long period of hesitation, Rumania has finally decided to adopt broadcasting, and it is hoped that a 12-kw. station under construction at Otopeni, between Bucharest and Ploesci, will be working before the end of the present month. A provisional 400-watt transmitter is already in operation on 401.6 metres. According to the *Plan de Bruxelles*, the station should be working on 223.9 metres.

The following item from the columns of the *Electrician* may not be unconnected with the above information: "According to a Customs Circular dated Dec. 14, 1928, wireless apparatus and accessories may be imported into Roumania without any permit from the Roumanian Postal Authorities."

The *Board of Trade Journal* states that the First International Exhibition of Radio Apparatus in Roumania takes place in Bucharest from April 15 to June 1 this year. Apparatus for exhibition admitted free of duty. The *Journal* suggests British firms could exhibit with advantage. For further information apply Le Comité d' Organisation, Exposition Internationale de Radio, 171, Strada Romana, Bucharest III.

RUSSIA.—The number of individual listening licences in the Soviet Union now exceeds 304,000, says *World-Radio*, of which roughly 264,000 represent dwellers in towns, the remaining 40,000 being villagers; the number of crystal-set users is 255,000, and the balance (49,000) have valve sets, and, of the latter, 13,000 have loud-speakers. Thus, 87% of the receiving sets are in towns and 13% in the country; 10,000 crystal sets and 300 loud-speaker sets are being used in "houses of detention" (the Soviet substitute for prisons). A Russian expedition has established a radio transmitting and receiving station on the Caucasian mountain Kazbek. Experiments are being carried out at various altitudes up to 5,300 metres. The leader of the expedition is the director of the most northerly station, Tiflis. The Chief Hydrographical Department of the U.S.S.R. has decided to establish a radio station on Cape Jelanyi, 77 degrees of northern latitude, to observe the movement of ice fields and also carry out scientific meteorological observations. It will be the most remote northern station in the world, and, together with those on Matochkin Shar and Yougorsky Shar, will serve the Polar seas.

SIAM.—The Prince of Kambaeng Bejra, Minister of Commerce and Communications, explains that the law banning wireless apparatus is designed to protect the pocket of the Siamese citizen. Experiments are under way which are designed to test broadcasting conditions in Siam to find out what type of apparatus is most suited to the climate, the *Evening News* announces. As soon as they are completed, says the Minister, announcement will be made of the type of broadcasting contemplated for Siam and the type of wireless sets most suitable to receive it. Then the ban will be lifted.

SOUTH AFRICA.—The South African Wireless Telegraph Co. decided, on Jan. 8, to order equipment for a radio-telephone service with England, which is expected to be in operation within nine months.

SWEDEN.—Reuter's Trade Agency in Stockholm informs us that the number of receiving licences is steadily growing, the increase during the last three months of 1928 having been nearly 10,000, so that the total rose to 381,000, or 62.6 per thousand inhabitants.

SWITZERLAND.—The Canadian Broadcasting Commission (see also under CANADA) visited Geneva on Feb. 8 and had discussions with members of the Communication and Transit Section of the League of Nations and with the Secretary-General of the Union Internationale de Radiophonie.

There is no truth in a report that cable communication is being established between Geneva (Switzerland) and Kootwijk (Holland) for the world broadcasting of League conferences at Geneva. According to *The Times*, the report probably arose out of the fact that the League Secretariat proposes to begin, at the end of February or the beginning of March, new technical experiments (on the lines of those of last summer) in the broadcasting of speeches from Geneva to distant points by a short-wave transmitter. The Netherlands Government is again placing its Kootwijk station at the disposal of the Secretariat for one experiment a week.

TRISTAN DA CUNHA.—The Rev. A. G. Partridge sailed last month to take up his voluntary duties as Chaplain. He has with him a standard Marconiphone three-valve short-wave set, which has been presented to the island by friends. As there are no facilities for charging batteries, the high-voltage anode energy will be provided by a bank of 90 large Leclanché cells, and the valve filaments will be heated by special Sterling "Invicta" cells. It is calculated that they should last twelve months, and as it is hoped that arrangements will be completed for a special schooner from Cape Town to call at least once a year, there should be no interruption of reception. Thus this tiny group of humanity will be brought into daily contact with three continents: Europe, through 5SW (Chelmsford, England) and PCJJ (Holland); America, through 2XAD, 2XAF, and other short-wave transmitters; and Australia, through 2FC (Sydney), and perhaps 3LO (Melbourne). It is also possible that the Cape Town (South Africa) station may be heard, adds *The Electrical Review*.

U.S.A.—The last-mentioned journal also publishes the interesting information that the American Institute of Electrical Engineers, through its Edison Medal Committee, has awarded the Edison medal to Dr. Frank B. Jewett for his contributions to the art of electrical communication. Dr. Jewett is vice-president of the American Telephone & Telegraph Co. and president of the Bell Telephone Laboratories. In 1904 Dr. Jewett joined the staff of the American Telephone & Telegraph Co. and began his engineering research work in telephony. Under the direction of Mr. John J. Carty, then chief engineer, Dr. Jewett worked out methods which led to phantom loading of large-gauge and open-wire circuits, the practical use of telephone amplifiers and the development of phantom duplex cables. In 1912 he became assistant chief engineer of the Western Electric Co., and in 1916 chief engineer. During the war he served in the U.S. Signal Corps, and in 1925 was appointed to his present position.

British Relay.—Music broadcast by the B.B.C. was heard on Feb. 1 by American listeners from New York to San Francisco. The programme was carried on a wavelength of 25.53 metres by the National Broadcasting Company, being picked up from Chelmsford at Riverhead, Long Island. The experiment was not altogether successful owing to severe atmospherics.

British programmes will also be heard all over the United States in March by transmitting them by short waves across the ocean. The British Broadcasting Corporation's programmes are to be received at New York, says *The Times*, by the Radio Corporation of America at Riverhead, Long Island, the Corporation arranging for further broadcast from the Atlantic to the Pacific. Arrangements are also being made for European listeners to hear American programmes.

At its meeting on Dec. 22, the Radio Board decided to rescind, on Jan. 1, 1929, the licences of two television stations, namely, WGY Schenecaty, and WIBO Des Plaines, Ill., and indicated that a special broadcast band would be set aside for television experiments, says *World-Radio*. This action, it appears, followed reports that television transmissions were causing interference with the regular broadcasting channels.

American Radio Dispute.—With regard to the dispute mentioned in our last issue (p. 85, col. 2), it has since been reported that a suit against the "Radio Trust" licences was to be heard in the United States Court at Wilmington Del, on Feb. 11. The *Financial News*, however, points out that the "Trust" has lost its case twice, and that the present suit is to make the injunction permanent. It will be recalled that the G.E.C., the A.T. & T., the Western Electric and others were defendants.

GENERAL AND PERSONAL.—*Parliamentary Queries and Replies.*—On Jan. 29 Mr. Malone asked if the Ministry of Transport was aware of the progress made in Germany in the development of communication between railway trains and the telephone service; and whether any experiments were being conducted in this country.

Sir W. Mitchell-Thomson, who replied, said he had asked for and received reports from time to time from the German authorities concerning an experimental service which was in operation on certain trains running between Berlin and Hamburg for the provision of telephonic communication between passengers in trains and telephone subscribers. Similar experiments conducted in this country had demonstrated the practicability of establishing telephonic communication with moving trains, but at present the demand for such communication did not seem likely to be sufficient to justify the expense involved to the railways in the provision of facilities.

Mr. Malone asked the Postmaster-General whether his department had at any time suggested to the British Broadcasting Corporation that facilities for experimental transmissions should be afforded to the Baird television system, such as had been arranged with the "Fultograph" apparatus.

Sir W. Mitchell-Thomson said he had informed both the British Broadcasting Corporation and the Baird Television Development Company a few months ago that, so far as his Department was concerned, he would be prepared to agree to the use, subject to suitable conditions, of one of the Corporation's stations for experiments with television apparatus. The Corporation decided, after its officers had witnessed a demonstration of the Baird system, that it did not then fulfil the conditions which would justify a trial through one of its stations, although it expressed its readiness to review this decision if and when development justified it. A further demonstration was being arranged, after which the question of using a broadcasting station for television would be reconsidered.

On Feb. 5 Mr. Thurtle asked the President of the Board of Trade if he was aware that the Baird Television Development Co., Ltd., had not held any annual meeting or submitted any accounts and balance sheet since the company was floated in 1927, a period of more than 18 months; and if he was proposing to take any action to enforce the law against that company.

Sir Philip Cunliffe-Lister said he understood from the Chairman of the Company that the meeting was deferred in view of negotiations with the General Post Office and British Broadcasting Corporation, which were in progress in the latter part of the year for the provision of facilities for an experimental broadcast of television; that arrangements had only just reached a stage at which progress could be reported to the shareholders; and that a general meeting was now being convened. In the circumstances, he did not think that any action on his part was required.

Lord Apsley asked the Postmaster-General how many miles of telephone and telegraph lines were relaid underground in 1928 and at

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what cost; and whether he was making any arrangements with electricity supply companies with a view to securing their co-operation where new electric cables were being laid in the same district.

Sir W. Mitchell-Thomson said that ducts and cables containing approximately 600,000 miles of wire, were laid underground during 1928 at a cost of £4,280,000. About 40,000 miles of this represented diversion of overhead wire. Arrangements had been in operation for some time past for the exchange of information between the Post Office and other undertakers, including electricity supply companies, with regard to projected underground works, and every endeavour was made to secure co-ordination in this respect; but it was undesirable to lay telephone or telegraph lines in very close contiguity to power circuits.

On Feb. 7 Colonel Howard-Bury asked the Chancellor of the Exchequer whether, seeing that the receipts of wireless licences amounted to £1,250,000, of which £824,000 was paid to the British Broadcasting Corporation and £254,000 to the Exchequer, he could see his way to reduce the wireless licence fee from 10*s.* to 7*s.* 6*d.*

Sir W. Mitchell-Thomson, who replied, said he could not. He shared the view expressed by the Crawford Committee that a fee of 10*s.*, which was equivalent to 1*d.* for three days' programmes, was not unreasonable, and he did not propose to recommend a reduction.

Also, in reply to a question in the House of Commons, Lord Wolmer, Assistant Postmaster-General, stated on Jan. 24 that the number of wireless receiving licences in force on Dec. 31, 1926, was 2,178,430; on Dec. 31, 1927, it was 2,395,106; and on Dec. 31, 1928, approximately 2,628,000.

Private Companies.—Amalgamated Wireless (Australasia), Ltd.—Dividend of 6% for year ended June 30, 1928 (first since 1922), is announced. Pending result of wireless cable negotiations, board thinks it desirable to postpone the ordinary general meeting.

Western Union Telegraph Co.—The earnings report for the past year, with the December figures estimated, shows a gross revenue of $139,244,596, against $134,460,816 in 1927. The available balance is given as $18,983,074 (against $18,614,784), and after deducting interest on bonded debt there is a net income of $15,373,669, as compared with $15,030,453.

For Our Advertisers.—A Danzig firm desires to be placed in touch with British firms able to supply 170 tons of copper wire and 4½ tons of bronze wire. My information is undated, but the reference number for further details from the Department of Overseas Trade is A.X. 7,374.

New Zealand Post and Telegraph Department. Mar. 26—Switchboard cords (reference B.X. 5,067).

South African Posts and Telegraphs. Mar. 28—Supply of telephone switchboard cords (tender No. 148) (reference B.X. 5,048).

Postmaster-General's Department, Melbourne. April 2—Supply of jumper rings and terminal strips (schedule C. 405) (reference B.X. 5,066).

All references are for D.O.T. See also under "British East Africa" above.

Obituaries.—The death of Mr. Stephen Paget Luke took place on Jan. 1, in his 84th year. He was appointed to the Indian Telegraph Department in 1868. In 1890 he was appointed Director of the Construction Branch of the Telegraph Service. In 1895 he was promoted to be Deputy Director-General of Telegraphs, represented India at the International Telegraph Conference at Budapest in 1896 and retired in 1897. Mr. Luke was a director of the Telegraph Construction & Maintenance Co., Ltd., and was for some years chairman of the Calcutta Electric Supply Association

The death took place on Feb. 2, at his residence, at Weston-super-Mare, of Mr. Thomas C. Stephens, superintendent at Weston for the Commercial Cable Co. He succeeded Mr. J. P. Gorton in this position in December, 1927, and he had been with the company for 40 years.

Mr. J. H. Jones, late manager of the cable depot of the Eastern Extension Telegraph Co. at Singapore, left £12,263 gross and £12,031 net personalty.

To this list of veterans of the Telegraph Service who have honourably served the craft in their respective spheres one must add yet another equally honourable; maybe less widely known; certainly not less beloved. Henry John Smith (Daddy Smith) passed over on Jan. 27, due to an attack of influenza, in his 88th year. His daughter, Miss F. Smith, is at the present time a supervisor in the C.T.O., where her father spent so many of his service years. He entered the Electric Telegraph Co. in 1861. After the transfer, in 1870, he was attached to the night staff as a Clerk in Charge, together with the late Mr. Alfred Eames, Stanley J. C. Ferguson and others, including Mr. Harry Brookman, still living in his 90th year.

Mr. Smith's sobriquet, of "Daddy," was earned in his early days, always wearing a long flowing beard, and later to the fact that he was most gentle in all his dealings with his subordinates. He had reached the Higher Grade of Superintendent in 1901, when he retired after 40 years' service.

Congratulations to the following: Miss Stokes, upon her retirement from the C.T.O. upon reaching the pensionable limit of those who, despite the stress and strain of these latter supervising years, have reached the desired goal, and that, with health not too sadly impaired to preclude a long and happy leisure.

Miss Stokes entered the Service as a Telegraphist in 1884, promoted Asst. Supervisor, 2nd Class, 1904, 1st Class 1914, Supervisor 1919 and later Supervisor, Higher Grade, and leaves behind her a host of friends and well-wishers in all ranks.

To Miss H. M. Rimington, who takes her place, none will begrudge this official seal on her competency.

To the following group of C.T.O. Overseers and Superintendents, especially in these lean years, congratulations also, wishing the group were much larger: Mr. T. W. Jones to Asst. Supt. (Lower Grade), Messrs. C. Custance, E. Hopkins, A. E. Wheeler, F. Norton, Sen., E. W. Hewer, W. K. Ware and R. P. Mitchell, to Asst. Superintendent's class.

Greetings from Mr. A. Statham, now in charge of Karachi Civil Radio Station, and who wishes to thank the staff of the C.R.O. for their help and courtesies when visiting that section in 1926. Also from Mr. E. Bradley, travelling in Algeria!

It was a thousand pities that the inclement weather and other circumstances reduced the audience who were able to put in an appearance at the I.E.E. on the 18th ult. to so small a number when A. J. Waldegrave, Esq., M.B.E. (Deputy Comptroller and A.G.D.), gave a most illuminating address on "Commission Control of Public Utility Services."

Anyway, those who listened to what one of the speakers afterwards declared to be "one of the most *listenable* addresses," were well repaid for *any* inconvenience suffered by putting in an appearance. Doubtless the paper will be published, but nothing will give back again to those who were fortunate enough to be among the privileged few to *hear* the actual delivery: its freedom from all monotony of tone, its touches of dry humour, which, without rancour, drove home a point, its simplicity of language, and the evident sincere desire of the author to give a well-balanced view of matters which are coming more and more to the fore in the next decade or two.

THE THINKING MAN.—"The man who cannot think is not an educated man, no matter how many college degrees he has acquired."—*Henry Ford.*

J. J. T.

C.T.O. PENSIONERS' NEW YEAR REUNION.

THE 9th New Year gathering of pensioned colleagues of the C.T.O. took place at the Express Dairy Private Rooms, Bloomsbury, on the 9th ult.

There was, as usual, a good attendance, though naturally, with the flux of time, several familiar faces were missing, some through more or less temporary causes, while one or two had joined the Great Majority since last we congregated.

Of these, Mr. W. T. Picking (Little Tommy Picking), who, entering T.S. in 1873, quitted it 3 years later to be an old R.E. man, and served in Cyprus and during the Boer War in 1899, retiring from the Telegraphs in 1920, passed away at the close of last year, followed only by a few days by the much-beloved Miss M. A. Watts. Miss Watts joined the old "Electric" Company in 1864, and fell asleep in her 86th year. She had a wonderful personality and was one of those rare folks who seem to bring an atmosphere of goodwill, brightness and love of all that is beautiful with them. To the end she was able to take long journeys alone. To the last she declared in word and deed, "Life is a Beautiful Thing."

Still, in the last month of the year there also came the news of the death and burial at sea of that Controller friend of the C.T.O., Mr. John Lee, whose energetic spirit was far too strong for mortal flesh to hold any longer.

One minute's silence, all standing, was requested by the Chairman, Mr. J. Bailey, and reverently observed in memory of the dear dead.

Present: Messrs. W. W. Abery, G. Adams, H. E. Adams, B. G. Askew, J. Bailey, I.S.O., J. Bearman, T. G. Beavis, A. E. Beckett, H. E. P. Bell, C. Bent, G. T. Bennett, E. Bird, C. J. Boulton, H. J. Broughton, F. W. Butler, W. J. Callow, T. W. Charter, E. J. Clarke, F. Clark, J. H. Crook, J. Downing, A. W. Edwards, O.B.E., C. Elphic, H. Evans, H. W. Evans, C. J. Faunch, F. J. I. Fischer, W. S. Fisher, F. W. Fryatt, P. Garrood, W. E. Gibbins, J. G. Goldsack, J. Gough, E. C. Govier, G. Gray, T. W. Gunter, W. Haggerty, F. W. Harrison, C. H. Heywood, F. Hicks, G. H. Hickman, H. E. Higgins, E. L. Hilton, W. F. G. Hodes, G. Janes, D. W. Jones, J. J. Jones, W. E. Jones, A. W. Judd, C. S. Keen, R. E. Kemp, G. F. A. Lange, C. R. Lowe, A. W. F. Ludlow, R. C. Luttrell, A. W. Malein, J. A. May, C. J. Minors, A. Morgan, F. J. Muller, G. W. Murdoch, H. Oakman, S. Pearce, H. Pond, E. F. Poole, J. E. Sayers, H. W. Senhenn, S. T. Shapcott, J. W. Sherrington, S. J. Smith, E. J. Stone, J. J. Sympson, G. E. Taylor, W. J. Town, S. Trott, C. J. Turner, W. Turner, J. J. Tyrrell, A. E. Ward and H. B. Winder.

In any case, one cannot but note the presence of some of the notables, Jim Bailey, bland and smiling, W. S. Fisher, the doyen of the party and now in his 82nd year, Alf Morgan and Ben Askew, who are running neck-and-neck for their diamond jubilee wedding celebration, Teddy Hilton and "John Bennett" of old P.T.C.A. fame, Alf Edwards, alert and genial with a full programme of activities new and old, Master Judd, the last of the old "I.D.," and Jimmy Tyrrell with his old mentor, Harry Broughton.

The presence of that trenchant, incisive speaker and writer, Adam Jordan, was sadly missed, though the news of his condition was somewhat reassuring one is glad to note.

It was unanimously agreed that appropriate letters should be sent on behalf of the gathering to the bereaved and to those who were laid aside.

C. S. K.

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INTELLIGENT anticipation! Watch this space next month for an article by Percy Flage on "Influenza."

London Wall Exchange.

The London Wall Refreshment Club gave a Christmas Dinner and Dance to 340 members and friends at Lyons' Corner House, Coventry Street, on Jan. 3, 1929.

Mr. Grove, who was accompanied by Mrs. Grove, acted as M.C., and the guests included Miss Cox, Miss Beaumont, Mr. and Mrs. Beck and Miss Ralph.

The committee is to be congratulated on the well-organised arrangements which made the evening so enjoyable to all present.

A concert was held on Jan. 9, 1929, at the Cripplegate Institute, to inaugurate a Dramatic and Orchestral Society. It was well attended, and the performers gave evidence that talent is plentiful at London Wall.

Misses C. Hunt and E. Shaw showed themselves possessed of fine voices, and recitations by the Misses E. Cooper and V. Antrobus were much appreciated.

The sketches—"The Society for Worn-out Wives" and a "Holiday in Switzerland"—did credit to all who took part, and the concerted items by the "Chorus" were well done.

Miss J. Moore spoke during the interval on the aims of the proposed Society; and the producer of the sketches was presented with a bouquet of carnations by the "Company."

Miss Johnston especially thanked the artists for their splendid efforts when the concert was over, and the evening was so successful that an election of officers for the new Society will take place at an early date.

G. M. T.

Bermondsey Children's Tea.

On Jan. 5 the Bermondsey Exchange and Engineering Staffs provided a tea and entertainment for a party of 100 children drawn from two of the day schools in the poorest part of Bermondsey. The entertainment took the form of a performance of "Aladdin" by members of the Exchange Staff and was much appreciated. The tea followed, when the children did full justice to the ham sandwiches, cakes, &c., provided for them. Afterwards they played games until 7.30 p.m., when each child was given a doll or toy and a bag containing cakes, sweets, apple, orange and bon-bon. Altogether the time passed very happily for all concerned.

K. E. W.

Mountview Exchange.

Among the notable people who visited Hornsey last week-end was our old friend Father Christmas, who paid a belated visit, but none the less welcome one, to the local schoolchildren at a party given at Campbourne Road School by the staff of the Mountview Telephone Exchange.

In spite of the chilly weather the little children arrived very early, some very much before the appointed hour, and all very anxious to be admitted.

More than one hundred children sat down to tea, and all ate with great relish the dainties provided for them—the arrival of Father Christmas brought forth a great cheer from the "kiddies." We hope that there still are some children who believe in the beautiful tradition of "Father Christmas."

Whilst the hall was being cleared for further activities, the children sang community songs with great gusto, and were entertained by recitations from two of the helpers, which met with such enthusiasm that only an encore would suffice.

Meanwhile the ball was kept rolling by the Bowes Jester Concert Party and a nigger minstrel who amused the children very much with their funny songs and stories.

And now—the great event of the evening had arrived. In one corner of the hall stood a large Christmas tree very tastefully decorated and lighted with many coloured fairy lights. Much thought had been spent in decorating the hall and tree, and the helpers were amply rewarded by the keen appreciation shown by the children.

Father Christmas presented each child with a toy and a packet of sweets from the tree, and they all appeared very happy and contented with their respective presents.

As all good things must come to an end, so did our little party. When the children were ready to go home they were given an apple, orange, banana and balloon.

Thus ends our second annual children's party, which we hope will only be one of many more.

D. A. P.

Willesden Section Social and Dance.

An enjoyable social evening was spent at St. Gabriel's Hall, Cricklewood, on Friday, Feb. 1, when all Exchanges in the Willesden section were represented, the total number present being approximately 150.

During intervals of dancing, songs were excellently sung by Miss Calkin of Finchley, Miss Pearson of Willesden, Miss Agar of Barnet, and Mr. Nobbs of Willesden. An exhibition of toe dancing was given by Miss Wotherspoon, of Willesden, and Miss Gustine of Finchley gave two interesting recitations.

Considerable amusement was added to the evening's entertainment by a play in one act, "Five Birds in a Cage," given by some of the Pinner telephonists, viz.: Misses Keeley, Worman, Daynes, Vainey and Blindell.

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Mr. Marland, Service Superintendent for the section, who acted admirably as M.C., passed a vote of thanks to Miss Sewell (Chief Supervisor at Willesden) for the excellent organisation and the enjoyable evening.

We all hope that there will be a repetition.

C. M. B.

Joggin' On.

I suppose it is at this time of the year that one is apt to feel the ill-effects of the strain entailed during the preceding winter months. Colds are rampant, and a general chill seems to be in the air. We feel somewhat disheartened, and discouraged. The following little rhyme, which I remember reading in a book some time ago, is perhaps a good description of this mood :—

I keep on joggin' on,
The Lord knows where and back ;
Each day seems the same,
Leaves me on the blessed track.
Seems to me I never move,
Every day's like them that's gone—
Still—I'm trampin' all the time,
Joggin' on.

And yet, although we may not appear to be accomplishing anything very great, we are in fact "tramping all the time," "sticking it," "facing the odds," "doing the work that's nearest" (though it's dull awhile !), and too, maybe, we are helping a few lame dogs as we go along. I think it was Spurgeon who said "By little strokes, men fell big oaks," and it is by many small things well done that we may find we have sown better than we knew, and the reaping may surpass all our expectations.

Let us take heart. The fairest day has yet to be—the sweetest hour is yet to come !

L. R.

A (True) Leaf from a C.O.'s Diary.

Now my "paper-work" is o'er,
I think a spot of "door-to-door"
Is indicated ;
And by employing *all* my wiles,
Whilst standing on the pathway tiles
Most antiquated
Of this still more ancient and decrepit villa,
I *may* induce the owner to consider
How much better
Off he would be with a 'phone,
How it couldn't be too well known
That a letter
Takes much longer to arrive
Than the spoken word—in short you're not alive
Without a "tele" in the hive.

* * * *

Two solid and misspent hours !
No wonder that a C.O. sours
At thirty-five.
What a street ! What a life ! !
And I'll bet that speculation's rife
As to why I've
Been around, and what's the game ?
They're all cast in the mould the same.

* * * *

Still, one more try. That new building there,
'Tis of a goodly size, and fair
At least I'll sow
The seed of a future heavy order.
(Perhaps I'll then be able to afford a
Bigger row
Of carrots next year in my garden).
Well, here we are—I *beg* your pardon,
In this half-light
I quite over-looked you A cigarette ?
Yes, vile weather—er—I did not get
To rights
Your name ? Ah, the general foreman, Arthur.
Well, well, I suppose you've not much farther
To proceed
With this job—Five floors ? Begad !
Accept this—I'd be glad—
Oh yes, indeed.
Now could you furnish me with "pars."
Of the firm concerned—I'd say a garage,
Am I right ?
For then I can arrange . . .
What ! A TELEPHONE EXCHANGE ! !
GOOD NIGHT ! ! !

R. A. L.

Meek Boy's Vengeance.

The English master at a certain school thought he might well employ the last period of one of his junior forms before the holidays in the construction of couplets. He gave the boys the first line, and waited to see what they could do. To the line—

"If I had twopence to call my own . . ."

a very insignificant and meek 11-year-old added :

"I'd insult the Head o'er the telephone."

– Extract from Provincial paper.

A. J. C., Preston.

Contributions to this column should be addressed : THE EDITRESS, "Talk of Many Things," *Telegraph and Telephone Journal*, Secretary's Office, G.P.O. (North), London, E.C.1.

LONDON TELEPHONE SERVICE NOTES.

Contract Branch.

THE business done by the Contract Branch during the month of January resulted in a net gain of 5,984 stations, as compared with 5,590 last year.

We have referred more than once in this column to the good results obtained from enclosing postcards advertising extensions with the accounts of subscribers who do not rent extensions. Up to the present orders for 2,458 stations have been obtained from this source and we take it as a compliment that this method of advertising, which emanated from the branch, has now been extended to the Provinces. It is a pity, however, that, through being a Government Department, we have not got the liberty of an ordinary commercial undertaking in choosing and designing our advertising matter.

We are glad to know that the suggestions in the notes entitled "Help" in the *Journal* for September are beginning to interest the staff outside the Contract Branch. Indeed, "Self-help" might have been a more appropriate title, as it must be evident that the increased growth of the system means more opportunities for the staff of all grades and branches, and when this sinks in fully we ought to have a large number of "unofficial Contract Officers" anxious to see the system extend as rapidly as possible. By-the-bye, have you sent in the names of any possible subscribers yet ?

The following extract from a letter indicates the curious nature of some of the instructions our Contract Officers receive during an epidemic of influenza like the recent one :—

"I want a longer cord. I am ill in bed. My maid is also ill in bed.

"When your man comes he is to ring the bell, then go and stand on the steps, and I will throw the keys of the house to him."

We hear that one member of the branch whose waist measurement is decidedly above the average went into a multi-coin box call office the other day to ring up the office ; he put his twopence in the box in order to get the exchange and explain that he wanted a service call, and intended to press button "B" to get it back. Imagine his face when he realised that his "corporation" had pressed button "A" during his efforts to get near the mouthpiece and his twopence had gone ! !

Up to the time of writing these notes, orders for 365 exchange lines and 37 call offices have been taken for the British Industries Fair, which was opened at the White City on Feb. 18. Arrangements have been made for continental and transatlantic calls to be available from certain call offices as well as from the exchange lines. A demonstration set of the automatic system has also been placed near the Imperial Institute Exhibit.

The orders obtained last year covered 311 lines and 28 call offices.

There were 214 exhibitors at the recent Furniture Exhibition at Olympia and orders were obtained for 85 lines. Last year orders for only 77 lines were obtained from 215 exhibitors.

The day when newspaper placards in London read "London Temperature below Zero," the staff at one of the district offices were trying to forget the cold and the frozen pipes and cisterns they had at home when they received two agreements, one signed by Jack Frost & Co., Ltd., and the other from British Evercold, Ltd. ! ! !

Four persons living in two adjoining houses in Horn Lane, Acton, had narrow escapes from death through gas poisoning recently. One of them

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owes her life to a telephone call. She realised her bedroom was full of gas and tried to get out but collapsed on the landing. After a time she was aroused by the telephone bell, struggled to answer it, and heard her neighbour say "Open your windows; come down and get out of the house."

She managed to carry out these instructions and is now more than grateful to the Contract Officer who induced her to rent the telephone some time ago.

* * * *

National Sanatorium, Benenden.

The third of this winter's series of concerts provided by the staff of the L.T.S., and ably organised by Miss Margaret Worth, was held on Saturday, Jan. 26.

The artistes were Miss Norah Smith, soprano, Miss Hilda Knight, mezzo-soprano, Miss Winifred Shaw, elocutionist, Mr. H. A. Wharton, trumpeter, Mr. John Curr, violinist, Mr. Tommy Watler, humorist, Mr. Hugh Williams, tenor, and Mr. A. C. Vincent, accompanist.

Miss Knight and Mr. Curr made their first appearance at these concerts and the former, in operatic solos, and also duets with Mr. Williams, proved a worthy addition to the party, while the latter's violin solos were greatly appreciated.

The audience, as usual, was very enthusiastic, particularly in the community singing numbers led by Miss Worth and assisted by the rest of the party. At the conclusion anxious enquiries were made as to the date of the next concert, and an assurance was given that a further visit would be arranged on Mar. 2.

One patient expressed a hope that he would not be discharged before that date, eager as he was to get home once again. Before leaving, Dr. Menzies, on behalf of the Medical Officer in charge, who, unfortunately, was a victim of influenza, in thanking the concert party in general and Miss Worth in particular, stated that the staff and patients' debt of gratitude to the L.T.S. was increasing to an enormous extent. Such an obligation could never be redeemed, but appreciation and thankfulness were offered in an abundant measure. After the concert the Matron provided an excellent supper for the artistes, and before departure Mr. Hugh Williams, on behalf of the artistes, once again thanked the staff for their hospitality.

A suggestion has been made in more than one direction that a Sanatorium programme should be given in town so that those who have shown so keen an interest in these concerts should have an opportunity of enjoying a type of programme that is at present confined to patients at the "San." Such a function would not be difficult to arrange, and the proceeds could be devoted to provision of further entertainments for our colleagues, the patients, but what measure of support would it receive?

Will the local representatives of this journal who receive any further enquiries with regard to this proposal kindly forward them to Miss Worth, 96, Goodwood Road, S.E.14.

* * * *

The London Telephonists' Society.

On Saturday, Jan. 26, the Annual Dance of the London Telephonists' Society was held at the Bishopsgate Institute.

Many who came to the dance are old friends who come because their recollection of past pleasures gives them pleasant anticipations of those to come; but amongst those who attended were many who had never before been present, and we hope that they, too, have now joined the magic circle.

The weather was kind: a great advantage when one is going to a dance, consequently everyone arrived feeling in the best of spirits. Owing to the goodness of Mr. Thirkell, who acted as M.C., the whole evening passed smoothly into our memories.

The Fourth General Meeting of the Society was held on Friday, Feb. 1, at the City of London Y.M.C.A., Aldersgate Street, E.C.1.

Owing to the unavoidable absence of the President, Mr. Dive, the chair was taken by Miss James, who introduced Captain Reid, a lecturer we had heard with pleasure last session.

Capt. Reid explained that his subject dealt with the psychological side of the problem of physical and mental aptitude of certain persons for a given calling, and he gave us many examples of the experience he has gained when carrying out investigations on behalf of various commercial firms. He told us of research work with which he is connected, instituted as the result of efforts of the Director of Medical Research of the R.A.F., the outcome of which will have a great effect on psychological selection as opposed to personal selection in the recruitment of staff; and which, he states, will avoid the possibilities of misjudgment which the latter method presents.

The methods used were demonstrated on some apparatus brought by Captain Reid for the purpose, and although the type of tests demonstrated were for finding the suitability of certain persons as aircraft pilots, the underlying principles would be the same if applied to other occupations.

At the conclusion of his lecture the audience were invited closely to examine the apparatus, and much practical interest was exhibited.

There is no doubt that this lecture was most popular, and the thanks of all were warmly extended to Captain Reid for the pleasure he had given us.

Football.

After rather a bad spell the team has suddenly returned to its best form by recording two successive wins against the Land Registry and Dollis Hill Research Depot, and the victories seem to have restored that confidence which was a notable feature of the team's work in the early months of the season.

The defeat of Dollis Hill, who have been leaders of the League for the greater part of the season, was particularly meritorious and the final score, 2—0, just about represented the difference in the two teams. The home forwards proved to be the better opportunists in a hard-fought game, although at one period of the game only superb goal-keeping kept the Dollis Hill forwards at bay.

The match against the Land Registry provided another keen and interesting encounter and resulted in a win by 3 goals to 1.

As against these two successes a close game with Customs, who are contending for the League leadership, ended in a draw of 2 goals each.

* * * *

The Telephone Play.

Rehearsals for the Telephone Musical Play, which is to be staged in April next, are actively in progress. The play bears the alluring title, "Telephone Tangles, or, Love in a Mist," and, when fully materialised, will prove to be another example of that happy combination of clever writing, tuneful music, charming dresses, and pretty faces, which Miss McMillan and her enthusiastic company have provided year by year.

The cast will include many well-known names. To mention some, there will be Miss Blair-Street—to give her the name by which she is best known to members of the London Telephonists' Society—Miss Latimer and Miss Price; Captain Hemsley, Mr. Whiffen and Mr. Hugh Williams. As in previous years, Mr. Pounds is the producer, while Mr. Cherry will be responsible for the scenery and effects.

Members of the London Telephonists' Society with recollections of the telephone plays of previous years will need no reminder to keep April 4 and 5 free of other engagements. As before, the play will be presented at King George's Hall, Caroline Street, Tottenham Court Road, and despite the close proximity of the performances and the Easter Holidays, a record attendance is confidently expected.

LIVERPOOL TELEPHONE NOTES.

MR. J. C. BURSTALL.—News has come to hand that Mr. F. Colin Burstall, late Traffic Supt., Class II at Liverpool, who, towards the end of 1925 went for a term of service with the Egyptian Government, has been appointed to the important position of Deputy Inspector-General of the Egyptian State Telegraphs and Telephones. We extend to him our heartiest congratulations. Mr. Burstall's earlier appointment, offering new opportunities and wider scope for his abilities, was confidently regarded as a step towards a successful career abroad. It comes, therefore, as no surprise to learn that within a period little more than three years he has been advanced to higher office.

Rapid progress is being made in the Egyptian Department of Communications, and within the Telephone System a very extensive programme is in hand—notably, conversions from manual to automatic switching. To these developments Mr. Burstall will, we feel sure, continue to bring wise direction and inspiration. We shall follow his work with the closest interest.

NOTTINGHAM TRAFFIC DEPARTMENT: VISIT TO MESSRS. ERICSSONS.

AN interesting visit was paid in January by the Traffic Staff of the North Midland Telephone District at Nottingham, through the instrumentality of Mr. G. Findley and by the courtesy of the Chief Engineer, to Messrs. Ericsson's Telephone Works, at Beeston.

Practically all the departments of the Works which cover many acres within sight of the beautiful Clifton Grove and near the river Trent were shown to the visitors.

Apparatus which is so familiar in our exchanges and apparatus rooms was seen in different stages of construction. One item attracted much attention, the "All-in-one-piece" telephone plug, which is turned out with great skill and rapidity and of which the firm has special reason to be proud. The imagination was put to the test by endeavouring to identify the various parts which were afterwards recognised as components of the auto switch gear.

After the tour of the works had been made the Firm very kindly provided tea, and during the progress of the meal Mr. C. N. Carter, Traffic Superintendent, expressed very hearty thanks for the pleasure and profit afforded by the visit.

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THE

Telegraph and Telephone Journal.

VOL. XV. APRIL, 1929. No. 169.

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All correspondence relating to advertisements should be addressed to MESSRS. SELLS, LTD., 168, *Fleet Street, London, E.C.4.*

TELEGRAPH AND TELEPHONE MEN AND WOMEN.

LXIII.

MR. FRANK RILEY.

MR. FRANK RILEY, Chief Superintendent of Telegraphs, Newcastle-on-Tyne, may be described in popular parlance as one of the bright young men of the Telegraph Service, having attained his present position at the unusually early age, in these days, of 42 years.

Possessed of an engaging manner, a sound sense of proportion, and a shrewdness native to his Yorkshire origin, Mr. Riley has made many friends who are not surprised at his progress.

Commencing his Post Office career at Sheffield in 1902, he became Telegraph Overseer in 1911. Two years later saw him Assistant Superintendent at Nottingham, and in 1919 he was promoted Telegraph Superintendent, Bradford.

Primarily a telegraph man, keenly alive to the possibilities and difficulties of that service, he was also associated with the sister service in the capacity of Trunk Exchange Manager in pre-transfer days and at Bradford his interest in telephones locally was helpful and constructive. When performing the duties of Assistant Postmaster he has also shown considerable adaptability in the mastery of detail.

A fund of dry humour finds expression on occasions when Mr. Riley can be induced to give some of his Fragsonesque numbers at the piano.

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HOW TO IMPROVE THE TELEGRAPH SERVICE.

III.—BY A CENTRAL TELEGRAPH OFFICE OVERSEER.

[NOTE.—*The Editing Committee accepts no responsibility for the views expressed in this series of articles.*]

THE Government telegraph service of the present day is subject to hard criticism by the British public, partly because it is a State Service, and the ordinary citizen is encouraged to decry all nationally-owned businesses—but largely for the reason that the telegraph as a quick and reliable means of communication has deteriorated. Users will agree that although the telephone meets many needs, it cannot be patronised to the exclusion of the telegraph and that the time is far off when the network of telegraphic communications throughout the United Kingdom can be abandoned. They are therefore disgruntled, and justly so, that a service which they are prepared to subsidise, as it is recognised it must be subsidised when widespread to nearly every town and village, is not as efficient as it could be made. They cavil a little at the subsidy when it is annually brought to their notice, but make no serious complaint. A good telegraph service they are prepared to pay for; it is any inferiority of service which is condemned.

The greatest improvement then, which will appeal to users, is not a slightly diminished annual deficit brought about by extreme measures of economy but the consolidation of quicker and more reliable methods. They would see gladly the necessary fractional increase in the national expenditure if their telegrams were dealt with expeditiously and without error. Such a service could be organised on businesslike lines.

First of all, the opportunity to telegraph at all reasonable hours and with little inconvenience. Every town of fair size should have at least one office of acceptance open from 7.0 a.m. until 11.0 p.m., and in the largest towns and cities an office open always. District Branch Offices should be open for acceptance until 10.0 p.m. in London and 9.0 p.m. in big provincial towns. No telegraph office should cease acceptance before 8.0 p.m. and all offices should remain open for delivery for at least half an hour after the hours of acceptance, for the telegraphic delivery the same evening without exceptions of all telegrams handed in. The public is not getting a square deal if messages paid for and accepted as telegrams are not treated as such. The practice of posting telegrams should cease. On Sundays and holidays, offices opening in the morning should open again later in the day; the opportunity to telegraph without the possibility of reply before the next day is not good business. The cost of such additional services would be practically only that of wages, with a small amount for lighting and heating. Other overhead charges, individual and accommodation, would be almost *nil*. The premises and the lines are there all the time.

The next thing is reliability. With the substitution of underground for overhead routes, excessive delays due to shortage of lines should be unheard of. There are too few spare lines on direct main routes. The most unfortunate breakdown, under modern possibilities, should not cause an additional delay of more than one extra transmission, and adequate staff and apparatus provision should be made for easy alternative main routing. Each zone centre should carry a generous reserve of staff and apparatus in order that any one centre may assist another with facility. Such reserve equipment of zone centres, at small percentage addition to the total telegraph expenditure, would have a remarkable effect in the stabilisation of the general service. The reliability of communications could be further improved by reducing the possibility of electrical and mechanical stoppages. The tendency is to attempt to work with too small a margin in every way. Conductors of low standard, low voltages, highest possible speeds and not enough reserve apparatus; all these things in combination reduce the stability of working. This traffic man or that engineer may propose various means by which margins can be reduced here and there, and show illusory savings; but their ideas are frequently more costly in the results. Experiment should be strictly limited by margins fixed to ensure continuous working on all lines with a minimum of electrical and mechanical trouble, and it cannot be emphasised too strongly that the primary function of both traffic and engineering sections is to maintain communications without interruptions, rather than to sacrifice reliability in order to reduce costs.

Regarding the variety of types of apparatus each of which is favoured by different sections or individuals, it is probably already recognised that the number of species now in use is far in excess of practical needs and must be reduced; also that further introductions, except some extraordinary improvement thoroughly proved, must be discouraged. Reliability of communications brought to a higher standard would affect appreciably the reliability of operator working. Much of the unsatisfactory transmission of to-day is caused by the high proportion of errors and corrections associated with automatic telegraphy badly treated. Errors which can be directly attributed to operating are to a great extent caused by the interruptions and distractions which take place through apparatus faults and stoppages over which the operator has no control. A trained operator able to proceed steadily, with confidence in his instrument, makes few mistakes, and is encouraged to good work by good results.

The next important factor is speed. Not speed of apparatus, for that should be governed by reliability, but the speed of transmission from sender to addressee. Assuming that no time is lost from counter to instrument, adequate staffing is, of course, the first need. Most of the delay now takes place at re-transmission stages, particularly in the large offices, and there the remedy should be applied. Staffing at every stage should be with the object of signalling each telegram immediately on arrival and avoiding accumulation. That pernicious system the "carry-over" should be eliminated from telegraph working arrangements. To provide only sufficient staff to deal with only part of the traffic coming to hand during any half-hourly or hourly period is simply to create delay at the source and to multiply that delay at each point of re-transmission. Ordinary circumstances in any large office, such as slight delay from originating offices, minutes lost in the change over of staff, minor stoppages, &c., will always provide a "carry-over." To arrange for an original "carry-over" to which is added that due to the ordinary circumstances mentioned, all to be multiplied at each re-transmission point, is rank bad business if speed of transmission is to be recognised as the main object of the invention of telegraphy. There is no doubt a higher average operator-output can be obtained by having always a supply of telegrams on hand waiting to go forward, but it is the type of economy which does not appeal to the taxpayer. They are his telegrams which are kept waiting. Operators should be waiting for telegrams, not telegrams for operators, if an efficient service is to be established. The speed of delivery, too, could be quickened. Particularly in London, delivery offices are too few in number, in some cases being as much as two miles apart, and this in business areas. The "walk" system, whereby telegrams are accumulated to be sent out in batches at intervals of $7\frac{1}{2}$, 10, or 15 minutes, causes unnecessary delay. There was much to be said in favour of the old "docket" system, when telegrams were sent out immediately if a messenger was available, and the boys were encouraged to make rapid journeys by the payment of a small commission based on the number of deliveries made. Naturally it would not do to go back to all the old practices, particularly the one where the docket rate was reduced if the boys were considered to be doing too well, but a commission rate as an addition to a reasonable wage would be worth introducing.

Before the telegraphs can be turned into a first-class business concern, however, not only must there be every effort made to deal with telegrams as really urgent communications to be passed through as quickly as possible, but there must be a serious attempt on the

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part of those responsible for higher administration to improve the relationship between themselves and the staff which they control, that all may feel they are working together for a good service. There exists at present a cloud which must be dispelled. With the introduction of improved engineering and mechanical plant all the advantages have been seized for exchequer credit. The public gets its telegrams no cheaper and no quicker, the operator has to work as hard or harder than before. Operator output is gauged by estimating the highest possible number of transmissions per hour and multiplying by the number of working hours per week, and for many it is a life sentence. The act of cutting out all possibility of even momentary relaxation during hours outside peak pressure periods has automatically eliminated all reserve energy. An operator treated as part of the machine is likely to become machine-like. As well expect the machines themselves to initiate, co-operate, and take a pride in the business. Good work is still performed, but when minimum staffing at all times prevents the possibility of rising to any special occasion, enthusiasm becomes lessened. Every hour of the day must seem alike and such monotony is discouraging. Minimum staffing during peak hours is sometimes inevitable; at other periods reduced standards would not only relieve a continuous strain but would prevent those difficulties which occur frequently during maximum pressure from dragging on throughout the day. Further, a feeling has spread that the telegraphs are regarded as a dying concern, and that the ruthless curtailment of establishments is to hasten the funeral. Nothing short of definite changes in organisation and improvements in working conditions will revive a spirit which at one time never flagged. Greater attention to the comfort of the staff would be generally beneficial; well-ventilated, well-lighted, and bright offices are conducive to cheerful service. Good staff conditions must be made an important feature, as they are in every successful modern industry.

Given the right machinery, the official provision and intention to build up a fast service, the stimulation of staff interest and pride of service, then will be the time to go for more business.

Let the public know it can send telegrams early and late, with a fair chance of delivery the same day. Encourage registration of abbreviated telegraphic addresses by offering a permanent registration for one payment of one guinea, instead of an annual charge; telegraphic addresses on business correspondence bring more telegrams. Pass through as "Urgent" all prepaid replies. Cease charging twopence extra to the sender who does his own operating from a telephone call box. Abolish the extra charge for telegrams on Sundays. Brighten up the public offices, light them well, keep clean the windows—and advertise.

[The next article in this series, by a representative of the Imperial Cable and Wireless services, will appear in our May number.]

CORRESPONDENCE.

HOW TO IMPROVE THE TELEGRAPH SERVICE.

TO THE EDITOR OF "THE TELEGRAPH AND TELEPHONE JOURNAL."

Dear Sir,—Thirty years' observation of the troubles of the Telegraph Service leads me to suggest that the most urgent reforms necessary to save the service are:—

"RUSH," &C., CLASSES.

1. Provision of three classes of service:—

(*a*) "Priority" at treble ordinary rate;
(*b*) "Ordinary" rate;
(*c*) "Period" (or Deferred) at half rate.

Local Telegrams for delivery in same town at half rate.

FULL TIME DELIVERY.

2. Arrangements to be made with garages, hotels and any suitable subscriber on telephone for delivery, on commission basis, of urgent messages when usual means not available. Confirmatory copies being sent by post. This system should be tried in suitable localities. Fees being collected from addressee. Refusals of fee would be scarce, if message refused delivery.

ADVERTISE.

3. Publicity by means of posters on P.O. premises, outside and inside, giving propaganda matter similar to Underground posters. Total messages sent—Average time of transit—Percentage of failures—Averages of Priority—Deferred and local services, &c.

FREE ADDRESSES.

4. Free addresses—this would eliminate the expensive system of registered addresses, with its delay and errors. Large firms could use name and 'phone number which would be quicker and easier to circulate at delivery stage. Other messages would be easier to deliver and trace. The innovation would be immensely popular with the public, and would expedite the service.

OFFICE DELAY.

5. Reduce the serious "Drag" period in all offices by giving only one-hour collecting periods to collectors and insisting on *immediate* transfer of messages at *all* periods, especially slack hours and Sundays. Provision of conspicuous traffic cage for *all* circuits. Raising present collecting rack to more conspicuous height.

"A" FORM OBSTRUCTION AND RISK.

6. Eliminate the serious delay, especially on fast-speed circuits, caused by wrong signalling numbers of words and indistinct writing on "A" forms. This is a frequent occurrence and counter clerks should be compelled to re-write such words. The two faults should always be regarded as serious and deterrent action instituted to remove this cause of delay and risk to operators.

CONCENTRATOR EFFICIENCY.

7. Extension of concentrator system in large offices. This system, I believe, is extremely economical and adjustable to traffic, staff and apparatus maintenance. The costly installations of teleprinter system could be obviated, especially in view of the declining state of traffic.—Yours sincerely,

CONVINCED.

TO THE EDITOR OF "THE TELEGRAPH AND TELEPHONE JOURNAL."

Sir,—I read with interest the remarks by a C.T.O. Telegraphist on how to improve the telegraphs.

In the main the arguments advanced are similar to those previously put forward on a number of occasions and are, relatively speaking, more for the improvement of local conditions than for the advancement of P.O. telegraphic business generally. When the telegraphs first became of public service they were, comparatively speaking, a novelty, and as such provided their own advertisement. There was nothing at the time to compete with such a service as was developed for speed and reliability of communication. The system was a self-centred, homogeneous organisation which came to be respected for its work and skilled personnel.

In time a serious competitor arose in the telephone, which has since absorbed much short-distance traffic. The convenience of the telephone has resulted in its taking premier place in the public notice and the telegram habit has dropped in favour of a telephone call.

Time has seen the growth of a number of cable companies which have attracted public attention. True they do not handle inland traffic, but they are prominent as examples of private enterprise as distinct from the P.O. and form a basis for comparison. The average Englishman usually makes good use of his right to criticise the Government—generally in a more or less ambiguous manner. We in the P.O. suffer from the effects of our own particular form of the eternal triangle. If we attempt a thing and make it pay, we are accused of doing so through unfair competition and to the detriment of private enterprise. If we make an attempt which fails there are gurglings of joy and talk of the "usual Government muddle." If we do nothing—then a commission is appointed and we get the verdict of "inertia."

This state of affairs is obviously very damaging to the efforts of any body of workers. The incentive of ungrudging appreciation from the public is too often lacking and we hear only of our errors and lapses.

Apart from the effects of trade depression I should say that perhaps one of the most serious causes of the diminution in telegraph traffic is the apparent subordination of this business to other Government services which are operated from practically all offices in the kingdom. It would appear that far more space, time, staff and general attention is bestowed on M.O. business, parcels, licences, pensions and similar services than is given to telegraphs. The attention of the public is directed far more prominently to these matters than to encouraging the sending of telegrams. The C.T.O. is waiting to handle a considerable increase in traffic. It did so in the past and can do so now. The machinery and apparatus are there in readiness and a willing staff is available to participate in an enthusiastic effort to revive their craft. In this respect we could achieve much by displaying a really prominent sign above every telegraph counter and provide adequate staff to convince the public that we are really anxious to get its business.

Furthermore, it is of paramount importance that we should be able to guarantee delivery within a certain time.

For this purpose it would be helpful to display charts at telegraph counters showing approximate delivery times to various centres, local and provincial. It is fully realised by private companies that the public is greatly influenced

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by attractive forms and a neat businesslike presentation of the subject matter. Beam traffic emanating from T.S.F. is typed upon good substantial forms which can be effectively filed by the business man for future reference. But what of the traffic sent over the inland wires ? Are we certain that this is sent out in an equally attractive manner ?

The whole subject of our actual contact with the public must be overhauled and steps taken to see that only specialised officers are selected for accepting and interviewing duties. We must also insist upon the delivered copy coming up to modern standards and advertising telegraphic matters only. On the backs of all forms there should be printed a list of central or, more important still, the local offices, with their telephone numbers, from where the public may obtain a messenger.

The question of charges is a matter for separate and serious consideration of the specialists.

However, experience with cheap foreign greetings telegrams would indicate that there is scope for this class of traffic for inland telegraphs—say a rate of sixpence for anything in the nature of *bona fide* greetings or congratulatory messages. This, after all, is not much more than the cost of a birthday card and the necessary stamp.

There is field for enquiry and the need of some gentle persuasion in getting many of our business men to overhaul their telegraphic arrangements. The majority of them have little regard for themselves or other people when it comes to the question of actual delivery. It is usually a far more difficult and prolonged affair for a boy to deliver a telegram than for a postman to dispose of a bundle of letters. The messenger is sometimes at the mercy of certain hall porters and commissionaires, whose peculiar idea it is to regard all messengers as veritable imps of mischief and therefore help them as little as possible—the lift being absolutely taboo ! It invariably happens that the messenger must walk up to the second or third floor and through various departments to the firm's office and there await the attentions of any clerk who may be handy.

All this time there are probably several more telegrams in the boy's pouch for clients who must suffer for the inevitable delay. I feel certain that if these matters are given attention we shall see the desired result in an increase of telegraphic traffic—but the business must be boosted ! We cannot nowadays sit back and wait for traffic to come to us but we must go out and fetch it !

Increase in traffic must inevitably alleviate many of our internal problems.

Cable Room, W. F. CASHMORE.
Feb. 26.

LIVERPOOL TELEPHONE SERVICE NOTES.

ON the evening of Mar. 8 the male members of the Traffic staff met at the St. George Restaurant, under the chairmanship of Mr. Staite, Traffic Superintendent. The occasion was one which afforded the staff the opportunity of appreciative expression to one of our colleagues, Mr. J. R. Hill, whose recent promotion to the position of Traffic Superintendent, Class II, at Canterbury, gave us so much pleasure.

Guests of the evening were Mr. Gauntlett, our District Manager, Mr. Coombs, of Glasgow, and Mr. Hammett, who left us a little while ago to take up another Civil Service appointment in the city.

The evening opened with a Hot Pot supper, admirably cooked and well served. This was followed by a few words from the Chairman, who presented Mr. Hill with a couple of pipes; these being supplementary to other gifts which were presented earlier in the day. Various tributes were then paid to Mr. Hill by his colleagues, followed by a few words from Mr. Gauntlett and Mr. Coombs. Mr. Hill responded in a manner wholly characteristic of him.

One could tell by the sincerity of utterance of the many tributes that the occasion was tinged with that feeling of sadness which must always accompany the loss of a colleague whose qualities have endeared him to all and everyone with whom he has come into contact. The tributes stressed the character of the man rather than that of the civil servant, and, as such, must surely occupy a warmer place in the recollections of Mr. Hill than could any tributes paid to official excellence only. We have sustained a real loss.

The presentation was followed by a musical entertainment, and a very pleasant evening passed all too quickly.

We have to congratulate Mr. G. Johnson, Asst. Traffic Superintendent, on the occasion of his marriage. The event was suitably recognised by the Traffic Staff, and no doubt our Manchester friends will join in the chorus "Better late than never."

A delayed social was held by the District Office staff on Mar. 1. The influenza epidemic was the cause of the delay, but happily all is now well. The social was a great success, and again the Traffic staff turned up in force. What a number of "young" lads and young ladies we have !

We offer the best of greetings to Mr. Askin, who has joined us from Shrewsbury.

INTERNATIONAL TELEPHONY.*

BY H. TOWNSHEND.

(*Continued from page* 108.)

Uniformity and Standardisation.—Representative views.

I will first quote the view expressed by Dr. Feyerabend, the permanent head of the German telephone service, in a very interesting book which he published recently on the occasion of the 50th anniversary of the invention of the telephone ("Fifty Years of the Telephone in Germany").

"The reports of the C.C.I., which rest on the judgment of the experts of the European telephone administrations in this field, are indeed only valid as recommendations, but the International Telegraph Regulations prescribe that the Administrations should keep, as far as possible, to these lines. The Telegraph Conference, which took place in Paris in 1925, associated the C.C.I. with the World Telegraph Union. Since 1924 the C.C.I. has met regularly and does very useful work.

"The decisions of the Paris Telegraph Conference represent a substantial step forward. The working and administrative prescriptions are assimilated in a far-reaching manner to the tested regulations of the internal German telephone service, to the benefit of those circles engaged in foreign traffic. The new and detailed regulations correspond to the views of most of the Administrations and could, therefore, to a great extent be adopted in the Règlement" (i.e., the International Regulations) "as binding prescriptions. Special agreements" (i.e., between the individual administrations concerned in each international telephone service), "which certainly cannot yet be entirely dispensed with, are required only to amplify the Règlement in a few points. In particular, they must fix the charges (terminal and transit rates), as regards a unit basis for which the Paris Conference could arrive at no agreement. In the meantime, the C.C.I. has set out rules on the rate question upon which most of the Administrations are building. The former variegated nature of the international telephone service is, therefore, disappearing more and more."

It is interesting to compare with this the view of an English authority, Mr. Frank Gill, a past President of the Institute of Electrical Engineers and a Vice-President of the International Telephone and Telegraph Corporation, who has been intimately associated with the development of European telephony for many years and who took a very active part in the preliminary work leading up to the founding of the C.C.I. I quote from a paper which Mr. Gill read recently to the Post Office Telephone and Telegraph Society: "The functions of the C.C.I., so far, have been to form a common public opinion among the long-distance telephone authorities of Europe as to certain matters, such as specifications for the construction of land-lines, rules regarding maintenance and some standardisation of traffic and rating matters, though these two are not as advanced as what is known as the Transmission Section. But in daily operation of the" (international) "service much more than common opinion or a book of rules is required." (I am tempted to add—much more still than a book of rules without common opinion behind it.) . . . "In all this, it is not the adherence to prescribed standards that is so important; it is rather the constant striving after better results, assisted by comparisons between divisions" (in Europe at present, countries) "which results in progressive efficiency."

You will see that both Dr. Feyerabend and Mr. Gill offer appreciative and constructive criticism of the achievements and methods of the International Telegraph Conference and the Consultative Committee—the former approaching the problem from the point of view of uniformity and the latter from the point of view of standardisation, in each case as a means to efficiency. I shall not venture to add anything further on this subject.

Finance.—Long-Distance Telephony Generally.

I now come to finance. Long-distance telephony is, of course, governed by the same general economic principles as other comparable public utilities, e.g., railways; and the classical doctrines apply. The costs are mainly capital charges incurred in the provision, maintenance and renewal, when either worn-out or obsolete, of the expensive line plant, consisting mostly of large-capacity cables and their associated repeater stations; staff costs are relatively small. The *amount* of line plant to be provided is determined by two factors:—

(1) The busy-hour traffic load, i.e., the average number and duration of the calls made per hour at the busiest time of the day;

(2) The speed of service to be given at the busiest hour of the day.

As regards the busy-hour load, it is obvious that no additional line plant can ever be required to carry the calls outside the busiest time of the day; if enough plant has been provided to carry the traffic in the busy hour without undue delay, the same plant will carry the lower load at any other hour with even less delay.

As regards the speed of busy-hour service, it is always possible within limits to allow orders for calls to accumulate during the busy hours, and so to be delayed to a certain extent, in order to save providing more international circuits on the route (which might be idle at other times) to dispose of the rush quickly. The extent to which it pays the Administrations and the public

* Paper read before the Institute of Public Administration on Dec. 13, 1928.

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to spend money freely in providing line plant to give a really rapid service in the busy hour is a controversial point to which I will return later. It is sufficient here to note that this question of busy-hour speed of service is inextricably bound up with rate policy, which, of course, largely influences both the total volume of the traffic and its degree of concentration into the busy morning hours. The *type* of line plant is determined primarily by engineering considerations; since, at any given time, when laying a new cable, &c., it practically always pays to put down one which will give the best possible speech transmission. The cost side of the accounts, which, as we have seen, depends mainly on the amount and type of line plant laid down, is therefore largely governed by two factors:—(1) Technical developments, and (2) the effect on traffic development and concentration of the rate policy adopted. On the revenue side, the governing factor is obviously the rate policy. The problem of rate fixing, or "tarification," is, therefore, fundamental to the finance of long-distance telephone service, and is bound up with the question of the speed of service to be aimed at.

Indeed, it is obvious that in any public utility supplied mainly by capital plant, the use of which is paid for by means of charges for individual services rendered—as distinct from utilities such as roads, which are provided free of direct immediate payment, or water supply, which is paid for by a levy whose incidence does not correspond very closely or immediately with individual consumption—the tarification policy adopted by the controlling authorities determines the point up to which each consumer's economic demand becomes effective, and so, indirectly but effectively, controls both the volume and the direction of the stream of capital flowing in to provide and keep up the plant. To treat tarification in such a utility as a mere question of cost accounting is to ignore the variations in the form of demand curves, and to throw overboard altogether the ultimate criterion of maximum satisfaction. There was, however, at one time a grave danger of this happening in Europe.

Finance of International Telephony.

In the case of international telephone service, the general principles of public utility tarification are modified both in theory and in their practical application by the peculiar conditions which necessarily obtain. In order to discuss these special conditions and their effect, it is convenient to summarise the recognised economic principles governing the general case.

General Principles of Rating.

It is, of course, common ground that the *general level* of rates in a public utility should be sufficient to cover the costs (interest on capital raised, including a sufficient element of profit to provide for development or research expenditure, depreciation, maintenance and operating) averaged over a sufficient period to allow for growth, the replacement of plant at possibly enhanced cost and the adoption of improved technical methods. The principles for determining *individual* rates may be put in the form that the rate for any service should be fixed primarily on what the traffic (i.e., the economic demand for that class of service) will, in fact, bear, rather than on what the individual class of service is supposed to cost. I say, "supposed to cost," because, as is, of course, well-known, where capital charges are the preponderating item in the total cost of an undertaking (and this is essentially the case in long-distance telephone service), there is always an element of doubt about the answer to the question, what does any particular class of service cost? This doubt is due to a theoretical ambiguity and cannot be resolved by any form of cost accounting, however elaborate. (This is, of course, a familiar general point in works on costing, and is not confined in its application to public utilities.) Since, however, most people naturally think about the rates they pay for a public utility in relation to costs, real or supposed, the classical principle can be translated into popular terms with rough accuracy as follows: The charge for any individual service in a public utility should be related to the special cost of that service (in the ordinary economic sense of the gross cost which the Administrations would save if they ceased altogether to provide that particular class of service, *other things remaining unchanged*) plus an appropriate fraction of the general or overhead costs of the whole utility, these fractions covering in the aggregate the whole of the general costs, and the fraction assigned to each individual service varying more or less inversely with the elasticity of the demand for that service.

General Inferences about Rating.

A few general conclusions about long-distance telephone rates can be drawn directly from these general principles. In the first place, as regards the general practice of accepting calls during the slack hours of the evening and at night at lower rates than in the day time, there is often a good deal of confusion of thought which can, I think, be avoided by going back to first principles. I have heard it argued that, since no line plant has to be provided to carry traffic at night, such traffic should be accepted at very low rates indeed, calculated at a level not much higher than would cover the operating costs. This argument, of course, comes from people who want to use the line at night. On the other hand, the view has been held, though not generally, that it is unfair to the ordinary user, who wants the bulk of his calls in the day time and has not much use for a cheap night service, to accept calls at night at anything less than the ordinary day rate. As the general theory shows, the criterion is the answer to the question—Is the demand for calls at night an elastic one? Or, in other words, will a reasonably low night rate bring in enough traffic during those hours to increase the total return on the line over a period of years? In general, the answer is yes; but obviously the night rates must not be too low or the effect of the differential, even if it does attract additional traffic, will merely be to lower the total return. If, however, the differential rate is properly fixed, so that the *total* returns are increased, its effect is to benefit not only the people who take direct advantage of it but also the ordinary busy-hour user, because, in the long run, the additional returns enable the general level of rates to be kept down.

Generally speaking, the correct fixing of almost any kind of international telephone rate involves a judgment about the degree of elasticity of the public demand for the particular service which is being dealt with. This is, indeed, only natural; it is precisely that kind of judgment which the business man is always consciously or unconsciously exercising—whether it be the directorate of a large firm studying the profitable exploitation of bye-products or a small shopkeeper selling perishable goods cheap on Saturday nights. The particular question of night rates which I have cited as an example of long-distance telephone tarification is one upon which telephone authorities are now practically all in agreement. Unfortunately, however, this is not yet the case in regard to the general principles which should govern the rating of auxiliary or accessory services. As regards these, it follows, I think, from the general economic principles, that there should be a bias in favour of fixing the main rate at a sufficiently remunerative level not only to pay for a reasonably rapid busy-hour service but also to enable the public to be offered such accessory services as they desire cheaply, without too much regard to the supposed average additional cost of the accessory services. A really useful accessory service, by bringing in additional ordinary traffic at a remunerative level, will increase the returns on the whole undertaking, even if the additional charges for the accessory facility itself are barely sufficient to cover its cost, considered separately.

Special Conditions of International Telephony.

So much for general principles; now to consider their application in the special condition of *international* service. Both the main principles, that governing the general level of rates and that which should guide the policy in fixing charges for particular classes of service, tacitly assume control of the whole utility by a single authority. But in the international telephone services there is no such authority. The telephone service between each pair of countries is conducted jointly by two or more independent telephone Administrations—usually national—who each provide, at their own expense, plant situated on their own territory. For example, both the cost of, and the revenue derived from, telephone calls between England and Sweden are shared between the Governments of Sweden, Germany, Holland and Great Britain. But these authorities are also each similarly interested in other international telephone services, as well as in their internal services. It may be presumed that accounts exist in each country for the international services in which it is interested taken as a whole, so that a general European, or even world, international telephone account could theoretically be made up by taking all the accounts of the separate countries and adding the respective cost and revenue sides together. Of course, no one is in a position to do this. Further, even if it were done, such an account could not be used to guide rate policy, because each country naturally requires its own international services to pay their way, and it is certain that neither in theory nor in practice would this result follow unless the revenue and costing elements of each country were treated separately. In practice, of course, this is what happens. The rate for a telephone call from Great Britain to Sweden, for example, is made up of 4 elements: The charge accruing to Sweden, that accruing to Great Britain and those accruing to the transit countries, Holland and Germany. This is equally true of the corresponding costs. This brings in two important points, one bearing on the question of the general level of rates; the other, on rates in individual services.

National Cost Levels—Interests of Transit Countries.

First, although plant may be more or less standardised as between the different countries, the gold cost of this plant is not so standardised. It is well known, for example, that in Europe some countries are countries of cheap engineering costs, and others of dear costs. Secondly, in considering the rates in individual telephone relations, that is, for calls between two given countries, it has to be borne in mind that, although all the countries providing the plant have a common financial interest in seeing that their share of the service pays its way, the terminal countries have a more direct interest in seeing that the (total) rate for each class of service offered is properly adjusted to the economic demand, and that the accessory facilities are suitable and adequate, because if any of them are not, their public will remind them of the fact. Fortunately, most countries are countries of transit for some telephone relations, as well as terminal countries in regard to their own international telephone services. But in so far as this is not yet the case, the preponderatingly transit countries, being as such out of direct touch with the users of the utility, naturally tend to take what is traditionally called a "Treasury" view of rating questions—with a tendency to over-emphasise the costing side of the economic position, to mistrust advocates of elastic rating schemes (e.g. in connexion with accessory services) designed to attract remunerative traffic in the future, and generally to adopt a protective rather than a bold rate policy, aiming less at trying to exploit profitably the public demand (in other countries) for service by means of their cables than to avoid incurring any risk of loss on individual calls, or classes of call, in the interests of foreign telephone users. It is only right to add that in regard to provision of plant, as distinct from operating and rating questions, most of the transit countries have adopted a far-sighted policy and have laid expensive cables freely to provide for anticipated growth of traffic passing through their territory; indeed, the rapid development of European international telephony during the last few years has been in no small measure due to this.

(To be continued.)

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TELEGRAPHIC MEMORABILIA.

AUSTRALIA.—*The Times* Canberra correspondent states that the Government is making arrangements to assume control of broadcasting throughout Australia on July 1, and tenders are invited for the supply of large quantities of material.

The telegraphic transmission of pictures between Melbourne and Sydney will be begun in the next two months.

BOUVET ISLAND.—Over twelve months ago, anxious to give our readers every scrap of news concerning telegraphy, it was announced in these columns that an expedition had already set out from Norway well equipped with radio apparatus, meteorological gear and stores. There was even some debate as to the ownership of this island. However, the island—or iceberg, as some aver it to be—refuses to be landed upon, and the expedition has returned to Cape Town.

CANADA.—Trans-Canada Communications, Ltd., with headquarters in Toronto, has been incorporated, with a capital of $1,000,000 (£200,000). Its charter includes everything pertaining to radio, including power to operate broadcasting stations, to manufacture or deal, and provide regular inter-city communication.

Receiving licences for the nine months ended Dec. 31 last totalled 243,768. In all the provinces, a steady increase over the corresponding period in 1927 was maintained.

The Commission of Inquiry into Broadcasting, which arrived in England on Jan. 15 by the White Star Liner *Baltic*, subsequently included Sir John Aird, its Chairman, whose sailing from Montreal was delayed. After studying broadcasting conditions in England, the Commission visited Switzerland and Germany before returning to consider the situation in Canada.

A conference on short waves took place at Ottawa in the latter part of January. The United States was represented by three members of the Federal Radio Commission, two of the Navy, and an assistant solicitor of the Department of State; Canada by the Deputy Minister of Marine and Fisheries, the director of the Radio Branch of that Department, and others connected with radio work in the Federal Government. Newfoundland, Mexico and Cuba were also invited to send representatives, who were present. Their recommendations were later reported to the plenary conference which, it is expected, will approve of them.

According to *World-Radio*, the recommendations are as follows: "The Governments agree to adopt a frequency standard based on the unit of time, and to compare at least once every six months the actual radio-frequency measuring standards; all stations other than mobile and amateur stations to tune their transmitters within an accuracy of 0.025%, or better, of their national frequency standard; and to maintain their frequency with an accuracy of 0.05%, or better, at all times. Each Government agrees to adopt for the present separation of 0.2% between channels; for commercial telephony a band width of six kilocycles will be permitted; for the present, a 100-kilocycle band width will be considered standard for television; to use transmitters which are as free as practicable from all emissions (such as harmonics, decrement, spacing waves, frequency modulation, key clicks, type of keying, mush, &c.) not essential to the type of communication carried on, which would be detrimental to communication being carried on by stations in other countries."

One can hardly overlook the significant mention of "television" and the measure of confidence suggested in its future by the reservation of a band for its use.

Carrier-current facilities.—The Bell Telephone Co., of Canada, contemplates an expenditure, says *The Electrical Review*, of $27,000,000 during 1929 on construction and expansion of facilities on its lines in Eastern Canada. This will be the highest appropriation in the history of the company, comparing with $22,000,000 during last year, which in turn was $4,000,000 larger than the 1927 amount. Of the $27,000,000 for this year, $7,000,000 will be for extending long-distance lines, including expenditure on new carrier-current facilities, new cables, &c. Part of the total is for the new headquarters building in Montreal, which will be ready for occupation in five or six months; eleven major building projects are under way.

GERMANY.—"We learn that tests have now been completed with the Korn photo-telegraphy apparatus which will allow German police to transmit finger-prints and photographs of wanted criminals by wireless. Sets of apparatus are being installed at Berlin and Breslau, and they will shortly be in use, Professor Arthur Korn said. Great improvements are said to have been incorporated in the latest apparatus, the whole picture is transmitted and received in one minute, which means that 5,000 of the points building up the picture are dealt with every second. The police will send all their telegrams as well as finger-prints and photographs by photo-telegraphy. They will simply write out their messages and transmit them as though they were pictures."

Brittain Scienservice, my informant, completes this paragraph by saying "Then mistakes will be impossible," which claim one might venture is likely to prove an impossible one to maintain.

Satisfactory results are claimed to have been obtained with a new method adopted by the Fultograph Gesellschaft for the transmission of still pictures. The altered system, which allows the immediate transmission of topical pictures, was first used on Feb. 21, by the Königswusterhausen station. Hitherto the Fulton system has necessitated the conversion of the picture at the transmitting end into a specially prepared foil, covered in varying degrees with insulating material. The new method replaces the metal point used in connection with the prepared foil to produce the electrical oscillations by a very fine ray of light, which plays upon a rotating glass cylinder, on which a photographic negative is placed. A Kalium cell inside the cylinder converts the light impulses into the required electrical impulses. Pictures have been transmitted on the Fulton system from the German national station at Königswusterhausen since Nov. 20 last. The hours of transmission are from 9.45 to 10.15 p.m. (Greenwich mean time) on Tuesdays and Fridays, and 12.45 to 1.15 p.m. on the other week-days and Sundays.

GREAT BRITAIN.—According to the British Broadcasting Corporation's estimates, the number of listeners during December, 1928, and January, 1929, increased by about 500,000, one of the biggest advances recorded. The increase in the number of licences for the two months is stated to be over 120,000, and is 20,000 more than the figures for the same months last year. The number of licences at the end of February was 2,690,116.

The *Wireless World* states that the exports of radio apparatus from this country during November last had a value of £84,049 (including valves £9,960). The principal buyer was the Netherlands, whose share was valued at £11,241 (valves £60). The next in order were Australia, £10,111 (valves £2,285); France, £7,301 (valves £174); Irish Free State, £6,042 (valves £929); India and Burma, £3,349 (valves £241); Rumania, £3,175 (valves £373); Germany, £3,167 (valves £82); and Italy, £3,126 (valves £16).

London.—The Faraday Centenary.—A meeting of British engineers and scientists was held at the Royal Institution on Feb. 15, under the presidency of Sir Arthur Keith, to arrange for the celebration in 1931 of the centenary of Michael Faraday's great discovery of electro-magnetic induction. A number of societies and organisations were represented, including the Royal Society, the British Association, the Institution of Electrical Engineers, the Institution of Mechanical Engineers, the Electricity Commissioners, and the British Broadcasting Corporation.

Parkeston.—A coastal wireless station at Parkeston and three new steamers for the L. & N.E. Railway Co.'s continental route, *via* Harwich-Hook of Holland, are to be equipped with Marconi valve transmitting apparatus. The interrupted-continuous-wave method of signalling will be used and the transmitters will each have a power of 1½ kilowatts and work on wavelengths between 600 and 800 metres.

Portishead.—It is exceedingly interesting to note the tribute paid by a French steam trawler engaged in long-distance fishing in the neighbourhood of New Amsterdam, in the Indian Ocean, to the excellent short-wave service the French operator was able to obtain with Portishead radio station.

The steamer is one of a fleet owned by *La Langouste Francaise* (now, then, ye experts in French menus !), and from letters which the writer holds, it is clear that the absolute sharpness of the signals received from the English station, the ease with which the telegrams were dealt with and their subsequent rapid disposal to their French destination, have evidently given more than usual satisfaction.

Swindon.—In a review of the progress of the Great Western Railway during last year it is mentioned that a system of wired-wireless has been adopted, giving an additional channel of communication between Reading and Swindon. Transmission from Reading is on a wavelength of 6,000 metres, and from Swindon of 7,000 metres.

On the occasion of the first ordinary general meeting of the Baird Television Co., Ltd., Sir Edward Manville (chairman), who presided, said that owing to questions which had been asked in the House of Commons the directors had been compelled to call the meeting earlier than they desired. He claimed that the company's system had attained a remarkable degree of perfection, and although at present the "televised" images were on a small scale, they hoped soon to be able to obtain the same degree of perfection on a larger scale. The Baird International Television Co. was in negotiation for the establishment of broadcasting of television on the Baird system in most parts of the world. The company owned two-thirds of the results of the International Co. from dealing with the patents outside the United Kingdom. The International Co. was formed with a capital of £700,000 so arranged as to give a working capital of a sum exceeding a quarter of a million pounds. Negotiations were in progress for the formation of companies in the Colonies and many foreign countries. Transmitting and receiving apparatus was now being installed in the chief Berlin wireless stations, and at least seven Continental broadcasting stations (including Radio-Paris) had invited the company to install transmitters. The company did not intend to manufacture receiving apparatus, but it had produced a number of such instruments to satisfy the first demand to a certain extent. Another direction in which the company was working was "Phonovision," the recording of images for subsequent reproduction with the sounds corresponding to them. Then there was also "Noctovision" and fac-simile telegraphy. One side line from which they were drawing royalties was a distortionless amplifier circuit. Arrangements had been made with an important French company for the establishment of broadcasting and television in almost all the principal centres of the Continent. After the chairman had answered a number of questions, the report was adopted.

Great possibilities are claimed for an invention that has been patented under the title of "an improved transmitter and remote recording system

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and apparatus therefor," says *The Electrical Review*, and to which our contemporary gives the name "Telfograph." Simple in the extreme, it consists solely of a small instrument, a few inches square, which acts either as a transmitter or a receiver of written messages, the connecting medium being either a telephone wire or wireless circuit. Its cheapness (the inventor, Mr. Archibald E. Telford, and the owner of the patent rights, Mr. W. J. Bullimore, stated to the *Morning Post*) supports the claim that it could be used by every telephone subscriber for receiving and transmitting written messages. The instrument contains a small typewriter of one key only, and a revolving drum on which the letters of the alphabet are arranged in suitable formation; a person can tap out the required letters, which are typed on tape automatically at either end of the telephone line. Should the engaged signal be given, the operation can still take place, and a message collected later by people when they return home.

Listening in to the Herrings!—Rear-Admiral H. P. Douglas, Hydrographer of the British Navy, recently revealed to members of the Royal Geographical Society that echo-sounding apparatus is now being used in an improved form for locating fish—the herring, for example.

"Fifteen trawlers," it is stated, "have now been fitted with the echo-sounder," and by listening in the "echo-sounder has proved of inestimable value in finding the banks where the fishing is good."

IRISH FREE STATE.—At present there are 26,000 receiving licenceholders in the Free State, bringing in a revenue of £13,000; on Mar. 31, 1928, the number was 24,000. On Jan. 13, 1929, the wavelength of the Dublin station (2RN) was changed from 319 to 411 metres, in conformity with the European redistribution. The Free State intends to be represented at the international conference which is to take place at Prague in April next. The Post Office recently submitted to the Ministry of Finance a memorandum on the service, including the proposal to erect a high-power station. There are now three studios, a new one having been opened last year in the P.O. buildings in Dublin.

JUGO-SLAVIA.—*World-Radio* informs us that before the opening tests last September of the new transmitter at Ljubljana, which serves the whole of Slovenia, Zagreb was considered the "local" station for Slovenia. When Ljubljana took over on Oct. 1, 1928, there were exactly 2,512 licences in force in Slovenia, the latest figure is 4,246, and since Jan. 1, 1929, the 5,000 mark has been passed. The number of actual listeners may be four times the number of licences, or about 20,000. Ljubljana is, of course, close to the Italian frontier; the Italian authorities, however, do not issue licences for sets within 30 km. of the frontier.

LUXEMBOURG.—*Wireless and the Movies!*—A Luxemburg scientist living near Paris has recently completed an intricate, but apparently practical, device for the transmission of moving pictures by wireless, says *Commerce Reports*. While the transmission and reprojection of films by wireless has already been accomplished by various means, in the present instance the size of the image transmitted is not limited; in fact, the perfection of the image reproduced increases with the size of the screen. The use of a positive film is eliminated, the transmission being accomplished by using the negative film direct, obviously an important consideration from the point of view of the rapidity with which pictorial news items, for example, could be displayed. The transmission and reproduction of the film do not necessarily take place at the time the negative is projected into the apparatus: the impression of the film is electrically transmitted and magnetically conserved (on a series of fine metallic ribbons) in such manner as to permit its subsequent wireless transmission for exposure on the screen, or screens, either immediately or at a later time. The conservation of the intermediate magnetic impression being more or less indefinite, the wireless transmission of the picture can be repeated without further recourse to the original negative film. The registration of sound can be accomplished simultaneously with that of the moving picture itself, so that talking films can be projected into the device, magnetically conserved, and transmitted by wireless for reproduction.

NEW ZEALAND.—From official New Zealand sources we learn that there are now 42,801 listeners' licences in force, besides 169 transmitting and 1,464 dealers' licences.

The *Daily Telegraph* correspondent in Wellington says that the American receiving sets have been dominating the market, but improvements made by British manufacturers have enabled them to secure a good proportion of the trade. German makes are in the market, and competition is being experienced from Australia.

RUSSIA.—Reuter's Moscow agency states that since the beginning of this year the whole business of broadcasting in the U.S.S.R. has been placed in the hands of the Commissariat of Posts and Telegraphs. A radio university has been opened (in addition to the existing technical and agriculture courses), the lectures of which are given only by radio. On Oct. 1, 1928, there were 326,285 registered radio sets in the U.S.S.R., 1.5 times as many as in 1927. This year the Commissariat of Posts and Telegraphs has been considerably extending the "radiofication" of villages by the adoption of the system of broadcasting by wire. According to the estimates of the Commissariat, the wire system should increase the number of radio listeners at the end of this year by more that a million. The broadcasting stations are now experimenting with so-called radio-films. Radio theatres have been opened in Moscow and Leningrad. On Aug. 1, 1929, a new radio station is to be opened in Moscow with a power of 75 kw.; its construction will cost 1,800,000 roubles.

SOUTH AFRICA.—Reuter, cabling from Cape Town, states that in replying in the Union House of Assembly to a question regarding the Imperial Cable and Wireless Merger, Mr. Sampson, the Minister of Posts and Telegraphs, said:—

"I do not think any Government of South Africa would confer on the existing wireless company, or any possible future combined wireless and cable company, a sole monopoly of all foreign wireless communications."

The following is apparently a further and expanded statement by Mr. Sampson, Minister of Posts, who, according to the same agency, made a communication with regard to his statement in Parliament on Feb. 12 respecting the Imperial cable and wireless merger. Reports suggested that Mr. Sampson's statement confirmed fears that the Union might establish some sort of service to compete with the merger, but Mr. Sampson emphasised that nothing in his earlier pronouncement justified such an interpretation; indeed, there was now no reason, after certain adjustments had been made, why a Government licence should not be issued to the Wireless Telegraph Company of South Africa. How could the Government grant a licence and at the same time set up competition against the South African Company? The Government did not contemplate such competition, and it would not be appropriate for the Government to exercise any pressure for the formation of a merger in South Africa, but if a merger were negotiated on voluntary lines by the cable and wireless interests, the Government had no power to oppose it, provided the terms of the Government licence and the Act were adhered to. The Government would insist on the full responsibility of the party concerned in carrying out its contract, whether it were a wireless company, a merger, or any other body. The British Post Office had, in connexion with the merger negotiations, reserved to itself the rights of telephony. He felt that the Union Government, in conjunction with the "beam" service, could possibly come to an arrangement on that matter and that terms also acceptable to the British Post Office could be arranged at the British end.

According to the *Daily Mail*, the British Post Office is awaiting the end of negotiations in the respective Dominions before beginning tests between England and Australia, South Africa and India.

U.S.A.—*The Ford Car and Radio.*—Reuter's Washington agency reports that the Ford Motor Car Co. has applied for permission to erect a new wireless station to enable it to communicate with the Ford rubber plantations in Brazil for both private and limited public service.

The new Universal Wireless Communications Co., which was recently granted forty of the seventy available commercial short-wave radio channels by the Federal Radio Commission, over the Radio Corporation of America, the Postal Telegraph-Cable Co., and other applicants, is already facing the possibility of a Congressional investigation as to "where it got the pull" and who, if anyone, is behind it politically. The transaction is reported by the *T. & T. Age* to have caused much discussion at the Radio Conference at Ottawa, Canada, which is trying to settle the intermediate-wave band on the North American continent amicably with delegates from the United States. The Universal Wireless Communications Co. is said to be organised by financiers in Buffalo, N.Y., with a backing of about $25,000,000, and claims that it intends to establish radio service between 110 cities in 48 States.

Nevertheless, Reuter's New York agency records that the Radio Corporation of America's annual report describes 1928 as the best year since the organisation was formed, the income for 1928 amounted to £4,732,397, as against £2,359,930 the preceding year.

The same agency reports that Mr. Newcomb Carlton, president of the Western Union Telegraph Co., stated on his return from Europe that a communications merger between the Radio Corporation of America (which works in conjunction with the European services of Marconi) and the Western Union Co. was still under discussion, but no definite decision had yet been reached.

The announcement that the laying of a transatlantic telephone cable between America and England was contemplated by the American Telephone & Telegraph Co. during the next five or six years was not a surprise to most of the cable technicians. The *Daily Telegraph's* New York correspondent cables: "The tremendous increase in the number of continent-to-continent calls by radiophony already threatens to overtax the wireless facilities, according to Mr. Walter Gifford, president of the company. The new telephone cable, the construction details of which the engineers have already worked out, will provide another means of transatlantic communication of maximum reliability. The cost of the cable is not stated, but it will be included in a sum of £400,000,000, which the company will spend on developments in five years."

WEST AFRICA.—The London *Times* reports that a wireless station is being built at Takoradi, Gold Coast. It will be equipped for communication with other West African colonies and to link up with the nearest stations of the main Empire service.

GENERAL AND PERSONAL.—*Parliamentary Queries and Replies.*—On Feb. 13 Sir Nicholas Grattan-Doyle asked the Postmaster-General if he would state what, for the year 1928, was the cost of the service organised by his department for the purpose of detecting radio apparatus operated without licences; what amount was recovered by fines; how many prosecutions were instituted; and whether the balance of expenditure was charged against the cost of the department or was deducted from the revenue from broadcasting licences.

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Sir W. Mitchell-Thomson said it was not possible, without undue cost in accounting, to segregate the cost of the specific work of detecting radio apparatus operated without licences. 1,135 prosecutions were instituted in 1928, and convictions were obtained in all but seven cases. The total amount of fines recovered, including costs where granted, was £1,186. The difference between the cost of the prosecutions and the amounts recovered was borne out of the proportion of the licence revenue which was retained for management.

On Feb. 14 Lord Wolmer, the Assistant Postmaster-General, informed Mr. Wellock that for the period from April 1 to Dec. 31 last the gross receipts of the Post Office from the Imperial "beam" wireless services were estimated at about £358,000. The credit balance in respect of the same period (before charging depreciation or interest on capital) was estimated at about £152,000.

On Feb. 21 Commander Bellairs asked the Postmaster-General, in view of the loss of £1,300,000 or more per annum on the inland telegraphs, whether he was aware that the Hardman-Lever Committee of 1927 was not permitted to consider the aspect of transfer to private enterprise; and whether, as the situation had been changed by recent legislation transferring the external cables to the new Communications Company, the Government would open negotiations on similar lines with that company with regard to the remaining telegraphs.

Mr. F. G. Penny, who replied, said that the circumstances under which certain overseas services were to be transferred to a Communications Company had no analogy in the case of the inland service; and the reply to the latter part of the question was in the negative.

Commander Bellairs also asked the Postmaster-General whether he was aware that, in Section 66 of the Hardman-Lever Report of 1927, the Committee unanimously advised that the possibility of the complete fusion of the telegraph, cable, wireless and telephone services might with advantage be explored; and whether it was the intention of the Government to obtain the evidence of officials of American companies.

Mr. F. G. Penny said that the answer to the first part of the question was in the affirmative, and to the second part in the negative.

On Mar. 5 Sir William Mitchell-Thomson, Postmaster-General, in reply to Mr. Thurtle (Lab.-Soc., Shoreditch), stated that on the invitation of the Post Office a demonstration of the Baird television system had taken place and was witnessed by a few members of all Parliamentary parties, in addition to representatives of the B.B.C. and the Baird Company. It was necessary to restrict the number because at present the nature of the apparatus made it impossible for more than a few persons to witness the experiment simultaneously.

CONTRACTS.—April 15.—Wellington, N.Z.—Post and Telegraph Department.—Supply of conductor cords. (D.O.T.)

OBITUARIES.—Though somewhat late one cannot but pay tribute to a tribute which *The Electrical Review* proprietors paid to their much-respected and beloved Arthur Hinton Allen, Technical Editor of the journal mentioned. Mr. Allen was only in his 57th year when, influenza and pneumonia close following, there "passed quietly on," quoting the words of our contemporary, "a man of pioneering spirit in scientific thought, research and practice, the advocate and champion of many an electrical movement, a straight and honourable gentleman who could give no quarter to a sham."

During the funeral of the late Sir John Denison-Pender, chairman of the Eastern Telegraph Co., the telegraph circuits throughout the whole of the far-flung system of the company were stopped for one minute, the staffs on duty standing in silence to honour their dead.

On Feb. 19 there passed away an at one time well-known figure in the C.T.O., Mr. Frank Farnam, after a sudden and brief attack of meningitis. Mr. Farnam retired in 1912 with the rank of Asst.-Supt. I. As a telegraphist he was an old-time Wheatstone expert, and was frequently sent to special events. On one occasion a unique incident happened to himself and four other colleagues when detained at Newbury P.O. till 1.45 a.m. in order to dispose of a speech of 20,000 words by Lord Carnarvon. Getting back late to their hotel, mine host thereof who happened to be of an opposite opinion to the chief speaker of the evening, refused to re-admit the five special telegraphists because they "had to do with a Tory meeting," so shut down the window and went to bed. It was raining hard and the police-station was the only refuge of the party!

The Post Office, however, took a serious view of the affair and mine host appeared at Reading a month or two later, before Baron Huddlestone, as to whether he had any reasons to put forward, &c., &c. The delinquent was suitably dealt with by the judge.

There must be some special attraction for retired C.T.O. officers in Algeria, for hardly had last month's columns been printed with the note that Mr. Bradley, formerly Supt., was visiting that country, than information came to hand that the Misses F. D. Stokes, Miss A. Wyatt and Miss E. R. Wright, all former Chief Supervisors, C.T.O., had just left on a tour in Italy, ALGERIA, &c.!

BUSINESS ADJUSTMENTS OF TO-DAY.—"Every business enterprise must in this highly commercialised age be prepared to adjust itself to any national change affecting its competitive status."—*Sir Josiah Stamp.*

J. J. T.

GLASGOW TELEPHONE NOTES.

THERE was a wonderful "gathering of the clans" on Wednesday, Feb. 27, in Central Exchange Retiring Room, when Col. Westbury presided over what was probably the most representative Staff Meeting ever held in this district. The occasion was the climax of the series of Official Meetings held during the past winter and anticipations were more than realised. Altogether there would be about 50 persons present. Each grade of the staff—day and night—was represented, officially and "associationally." Mr. H. West, the Head Postmaster of Paisley, was also present. The tone of the proceedings and the general atmosphere surrounding the talks of everyone concerned left no doubt whatever as to the efficacy and desirability of a movement such as this.

We have once again concluded a strenuous season of public official lectures on the Service. In the Session 1927-28 our readers will remember that 33 of these lectures were given to an aggregate "audience" of 4,067. During the current Session there have been 23 meetings with an aggregate attendance of 3,238. Over the two Sessions, therefore, 56 meetings have been held and 7,305 members of the public have listened to—and we think, enjoyed—our expositions and demonstrations of the service "from within." It will be seen that the average attendance per meeting works out at 130, which figure speaks for itself, not only as to the keenness of Glasgow audiences, but as to the sustained interest of the public in "telephones." The "Lecture Party" are to be heartily congratulated on their spirit and effort.

We regret to announce, and old members of the Glasgow Staff serving in other districts will regret to learn, that Mr. J. G. Mackay, Assistant Traffic Superintendent, passed away on Mar. 9 after a long illness. Prior to his superannuation early in October last, John had spent almost two years in a sanatorium seeking to regain health and strength, and it looked at one time as though he had been successful. He did in fact resume duty in August last, but the effort appeared to be too much. Messrs. Johnson (Traffic Supt.), Macdonald, Kennedy, Harvey, and Kerr represented the staff at the graveside, and floral tributes from the staff marked the passing of a popular A.T.S.

In place of the usual bi-monthly concert a Whist Drive, promoted by the Trunk Exchange staff, was held on Friday, Mar. 1, for the entertainment of the wounded soldiers at Bellahouston Hospital. A pleasing feature of the social was the substitution at whist of the men who are still confined to bed by their lady visitors, two of whom secured prizes for their protégés. Tea followed play, and then the prizes were presented by Miss Kay, who aptly expressed her own pleasure and that of her staff in again meeting those "who had done so much for us." One of the soldiers suitably responded on behalf of himself and colleagues to "Miss Kay's gracious remarks," and thanked the staff for a very happy evening.

A further successful Staff gathering was held on Wednesday, Mar. 13, in Green's Ball Room, Renfield Street, when a goodly and representative assembly foregathered for music and dancing. We were again favoured by the presence of Col. and Mrs. Westbury, Mr. and Mrs. A. E. Coombs, Mr. and Mrs. Johnson and others. Miss H. B. Mowat was in charge of the arrangements, than which nothing more falls to be said!

Our cordial congratulations to Miss A. W. Thompson, Assistant Supervisor II, on her promotion to Assistant Supervisor I, and to Miss A. B. Brown on promotion from an allowance post to that of Assistant Supervisor II. We also include in our congratulations Miss H. A. Watt, Clerical Officer, who, like many of her countrymen before her, has seized the opportunity of travelling South on a "single" railway ticket. The opportunity in Miss Watt's case was her appointment on Mar. 1 to an allowance post in the District Manager's Office, St. Albans. That all three officers may live long to enjoy the reward of their past labours is the sincere wish of everyone.

On Sickness and Sick Absence.

"Montaigne, who was great upon doctors, used to beseech his friends that if he felt ill they would let him *get a little stronger* before sending for the doctor. Louis XIV, who, of course, was a slave to his physicians, asked his friend Molèire what he did with his doctor. "Oh, Sire," said he, "when I am ill I send for him. He comes, we have a chat, and enjoy ourselves. He prescribes. I don't take it, and I am cured." (Dr. John Brown). "Esculapius knew that in all well regulated states there was some certain work enjoined everyone in the city which was necessary to be done, and no one allowed to have *the leisure of being sick*, and attentive only to the taking of medicines. This we may pleasantly observe in the case of labouring people, but we do not observe it in the case of the rich, and such as are counted as happy. For instance, a smith, when he falls sick, thinks it fit to take from the physician some potion to throw off his disease quickly, but if one prescribes for him a long regimen, putting caps on his head, and other such things, he quickly tells him that he hath not leisure to lye sick, nor doth it avail him to live in this manner, attentive to his trouble and negligent of his proper work, and so bidding such a physician farewell, he returns to his ordinary diet and, if he recovers his health, he continues to manage his own affairs, but if his body be not able to support, he dies, and is freed from troubles." (Plato).

"It is dainty to be sick if you have leisure and convenience for it." (Emerson.)

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PROGRESS OF THE TELEPHONE SYSTEM.

THE total number of telephone stations working at Jan. 31, 1929, was 1,730,782, representing an increase of 8,199 on the total at the end of the previous month.

The growth for the month is summarised below :—

	London.	*Provinces.*
Telephone Stations—		
Total at Jan. 31	617,570	1,113,212
Net increase for month	3,387	4,812
Residence Rate Subscribers—		
Total	146,643	231,808
Net increase	1,208	1,902
Call Office Stations (including Kiosks)—		
Total	5,536	20,108
Net increase	31	97
Kiosks—		
Total	1,245	4,897
Net increase	31	90
Rural Party Line Stations—		
Total	—	10,377
Net increase	—	—
Rural Railway Stations connected with Exchange System—		
Total	17	1,035
Net increase	—	16

The number of inland trunk calls made during December, 1928, was 8,906,427, bringing the total number for the year up to 107,592,369 ; this figure represents an increase of 7,613,940 or 7.6% on the total for the year ended December, 1927. Outgoing international calls made during December, 1928, numbered 35,325, making the total for the year 421,914, an increase of 101,327, or 31.6% on the previous year's total.

Further progress was made during the month of February with the development of the local exchange system. New exchanges opened included the following :—

LONDON—Pollards, Valentine.

PROVINCES—Aylesbury, Littlehampton, Dringhouses (automatic), Harbury (rural automatic), Haynes (rural automatic),

and among the more important exchanges extended were :—

LONDON—Harrow, Paddington, Primrose Hill, Sutton.

PROVINCES—Birkenhead, Christchurch, Dartford, Derby, Eccles, Petersfield, Whitfield, Ryde, Urmston, Wakefield (automatic).

During the month the following additions to the main underground system were completed and brought into use :—

Epping—Bishops Stortford cable,

Nottingham—Loughborough cable,

Tunbridge Wells—Cranbrook cable,

while 64 new overhead trunk circuits were completed, and 68 additional circuits were provided by means of spare wires in underground cables.

CONTINENTAL HOLIDAYS.

IN addition to conducting the Horsley Party on their annual tour in June, including in this year's itinerary Milan and the Italian Lakes, Mr. J. W. Fewtrell is arranging a party to visit Adelboden, leaving London on August Bank Holiday. Applications for particulars should be addressed to 48, Frewin Road, S.W.18.

THE DRAMA.

The Civil Service Dramatic Society in "The Last of Mrs. Cheyney."

An excellent performance of Mr. Frederick Lonsdale's comedy was given by the Civil Service Dramatic Society on Mar. 11 and 12 at the New Scala Theatre. Miss Joan Crisp (of the Savings Bank Dept.) gave a charming rendering of the title part. Much indeed depends on the plausibility of this enigmatic young woman's character, the all-important pivot on which this witty play turns. That a shopgirl possessed of good looks, charm, and aplomb, can be trained to cut a figure in good society is quite plausible. So also is her desire to escape from her sordid surroundings to luxury by the employment of doubtful expedients. But that a girl with the delicacy of character which Mr. Lonsdale endows Mrs. Cheyney should choose the path of burglary is perplexing. Her 'mor'l number is high" as Mr. Shaw's Hector would put it, if we accept the truly Anglo-American superstition that morality is only a matter of sex. Given, however, that his heroine could be persuaded into her course of action by a "crook" of great charm of manner and a public school and Oxford training—and the author is, of course, entitled to allow her this foible—the character of Mrs. Cheyney is otherwise consistent enough, and the comedy with its dramatic surprises and brilliant dialogue is worked out to an equally dramatic and surprising end. Mr. Hewetson took the part of the crook with great naturalness and persuasiveness. Indeed, naturalness was the prevailing note of a capital caste. Mr. Blake Greenwood as Lord Dilling well sustained a part requiring a considerable range of technique, and was particularly excellent in all his scenes with Mrs. Cheyney. Mr. Galpin as Lord Elton was appropriately pompous and fatuous, and Mr. Wall filled the comic rôle of the Hon. Willie Wynton with gusto. One of the best and most distinctive impersonations in the play was Miss Chandler's Lady Frinton, which caught exactly the right note. Miss Madge Harwood (of the Controller's Office, L.T.S.) was very good as Mrs. Ebley, and of the minor parts Miss Woodger's Joan stood out.

The G.P.O. Players in "Jugged Heirs."

Mr. Hodgson-Bentley's comedy of village life had a very good reception on its performance at the Guildhall School of Music on Mar. 15 last. It appeared to derive from the village comedies with which Mr. Eden Philpotts has familiarised us, and contained one of those family will-reading scenes in which the greedy heirs are suitably disappointed. Judd Beacham's device for testing the disinterestedness of his family was certainly ingenious and novel, but we thought the appearance on the scene of the missing soldier (the heroine's blinded father) punctually as his name was read out, savoured of theatricality. Apart from this, the play was skilfully developed, possessed some good character drawing, and was thoroughly enjoyable. Mr. John Cahill was in great form as Judd Beacham, and Miss Minnie Law as Anne was very natural and charming. Mr. Bernard Harewood as a young lover was quite successful in all his scenes with Anne, but Mr. Gerald Storr, very good in a part of somewhat unrelieved self-seeking and domineering, was inclined to be melodramatic at times. Mr. Wilfrid Sellars in the sympathetic part of Jim Cripps was delightful throughout. Excellent light comedy was provided by Mr. Eric Hudson as Simon Crakes and by Mr. Cyril Leigh as a schoolboy of ghoulish proclivities. Beacham's two daughters were played by Miss Dorothy Smith and Miss Margaret Henneker with the proper degree of waspishness. Finally, Mr. Jack Scott as "a soldier" made the most of his dramatic episodes and handled very satisfactorily the difficult rôle of a somewhat tragical figure moving in a realm of broad comedy. Both in the individual acting and in the ensembles the G.P.O. players lived well up to their high reputation. Mr. Hodgson Bentley, as we have said, had a hearty reception at the fall of the curtain.

W. H. G.

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Maintaining Strowge

Progressive

In the progressive wiring line shown h operators are used because of the nimblenes fingers and the greater deftness and expert which they master the wiring operation department is located in a corner of the with a continuous row of windows on affording ideal conditions of light and ve

STROWGER

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utomatic Supremacy—

of Switches

IN the factories of Automatic Electric Inc. the wiring of all switches, such as selectors, connectors, etc., as well as their assembly, is accomplished by a series of progressive operations. In switch wiring, each operator has one specified phase of the process assigned to her in which, from thorough training and constant repetition, she becomes remarkably skilled. By this specialization, both speed and accuracy are secured in the manufacturing operations. Constant supervision and exacting inspection insure high quality of workmanship.

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[*This is one of a series of advertisements illustrating the exacting care exercised in the production of Strowger Automatic telephone equipment, which is thus kept constantly in advance of the telephone art.*]

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The
Telegraph and Telephone Journal.

PUBLISHED MONTHLY IN THE INTERESTS OF THE TELEGRAPH AND TELEPHONE SERVICE, UNDER THE PATRONAGE OF THE POSTMASTER-GENERAL.

Editing and Organising Committee - - - J. STUART JONES. W. D. SHARP. J. F. STIRLING. W. A. VALENTINE. J. W. WISSENDEN.

Managing Editor - - - W. H. GUNSTON.

NOTICES.

As the object of the JOURNAL *is the interchange of information on all subjects affecting the Telegraph and Telephone Service, the Managing Editor will be glad to consider contributions, and all communications together with photographs, diagrams, or other illustrations, should be addressed to him at the G.P.O. North, London, E.C.*1. *The Managing Editor will not be responsible for any manuscripts which he finds himself unable to use, but he will take the utmost care to return such manuscripts as promptly as possible. Photographs illustrating accepted articles will be returned if desired.*

VOL. XV. APRIL, 1929. No. 169.

CORRESPONDENTS, CANDLESTICKS, AND TROMBONES.

PROBABLY no section of a modern newspaper—not even the Gossip columns furnished by those ingenious spirits who claim to have access to boudoirs, clubs, coteries, and the dark secrets of cabinet ministers—contains such an unrelated mixture of fact and fancy, sense and nonsense as the correspondence column. Letters from the scholar, the well informed and the expert; letters from the ill informed and the painfully inexpert; letters airing grievances, real or fancied; letters captious and facetious; letters suggesting reforms and improvements; and letters from those strange creatures who write to thank the editor for his public spirit in providing some feature of which they approve: all afford in turn instruction or amusement. Possibly 'good' editors sometimes publish bad letters with the design of exciting a lively controversy and drawing good corrective copy from well-informed writers. More probably they take their correspondents' information for what it is worth and leave it to interested parties to correct it. For instance, a correspondent's erroneous recollection of what the telephone rates were in a given foreign country would obtain as good, or better, publicity than an official document on the subject giving the correct rates. The interested party, the administration whose rates are attacked by implication, may sometimes reply; but the task of correction is a Sisyphian one, for the false information has in the meantime been copied perhaps by other papers.

The correspondence column is undeniably a very proper channel for redress of grievances. People fly naturally to the Press for help when they imagine they have failed to obtain it by more direct means, and who shall blame them? But many take the more dramatic, if less just, course of airing their grievances in public, before they have given the supposed offending authority the opportunity of furnishing its explanation.

A novel but increasing species of correspondent is the man who writes to tell us that which cannot possibly interest anybody but himself. A writer, for example, to the *Daily Mirror* last month says: "I have removed the telephone from my house. I could no longer endure its persecution." If a man gives up his railway season ticket because the train service is abominable and the omnibus is quicker, he may possibly do his fellow citizens a service by ventilating the fact. But if he gives it up merely because railway travelling is distasteful or distressing to him, surely his action interests no one but himself.

As regards the promotion of reform, it is interesting to record that amongst the various telephone reforms pressed on the notice of telephone authorities by correspondents from time to time, the form of the subscribers' instrument is an old one. When the present standard form of telephone was prevalent in America, the hand-combination set then chiefly in use in Europe (including this country) was jeered at as a "slide-trombone." Exhaustive tests, practice and experience demonstrated the superiority of the "candlestick" instrument, as it is now often contemptuously called, and it became the standard instrument in this country also. Of late there has been a mild newspaper agitation for the reintroduction of the "one-handed" pattern. Mr. Compton Mackenzie, the novelist, writes to the *Morning Post*: "Anyway, something will have to be done about the size and weight of receivers, for every time I visit London I notice with dismay the increasing resemblance of my friends to anxious esurient giraffes." Mr. Mackenzie will no doubt be interested to hear that the Post Office has placed an order for a large number of hand-combination instruments of improved pattern. We hope, therefore, that he may soon find some of his friends no longer resembling anxious, esurient, dumb creatures, but, rather, the talkative animals of Æsop.

It is better, perhaps, if we have ideas for the advancement of humanity, to give them vent in correspondence columns than to keep them cloistered and unproductive in the brain. We only suggest that all ideas thus put forth are not equally novel or even beneficent.

HIC ET UBIQUE.

THE American Telephone and Telegraph Company's report for 1928 shows the following progress:—

Number of Telephones—	1928.	Increase.
"Bell" Companies ...	14,524,648	798,592
Companies having connection with the Bell Co.s ...	4,672,387	32,957
Total ...	19,197,035	831,549
No. of Exchanges	6,224	109
Miles of exchange wire ...	53,415,692	4,136,313
Miles of Toll (Trunk) wire ...	8,777,052	1,233,536

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The Postmaster-General speaking at Alderley Edge last month in reference to Mr. Lloyd George's proposals for telephone development, pointed out that although the net increase in telephones in this country, did not exceed 125,000 (a record) last year, the gross increase was 140,000. This country showed a higher percentage of development during the last 5 years than any of the chief telephone-using countries, as the following figures witness :—

	Percentage Increases.		Percentage Increases.
Australia ...	71	Canada	33
United Kingdom	56	United States ...	29
New Zealand ...	46	Denmark ...	21
Germany	36	Sweden	19
Switzerland ...	34	Norway	8

The *Staffordshire Sentinel* contains the following tribute to the Telephone Service :—

Desiring to get into touch with an old friend in a small town, just beyond the Staffordshire border, I dialled " O " and explained. I knew neither the name nor telephone number of the office in which my friend was engaged. I was given a call to " Inquiries " at the town in question, and without a minute's delay I was put into communication with my friend. The town is small, and my friend well-known there, and it is not the difficulty of finding him that seems worthy of recording, but the fact that the task was undertaken so willingly.

A London suburban paper recently issued the following correction :—

In an article published in our last issue and headed " Fifty-fifty 'Phone Chance," it was stated that the percentage of calls completed on the first application were from 37.8% (in 1927) to 40.2% (in 1928). The figures should have been, respectively, 82.9 and 82.4, which, of course, is a very much better average.

Truly, a trifling error ! The wrong number joke scarcely appears to be against the Post Office here.

FORTY YEARS IN THE TELEPHONE SERVICE.

A SPLENDID record of a life spent in the Telephone Service stands to the credit of Mr. Richard Bryson, who has just retired, and there can be few men who have been more closely associated with the growth and development of the administrative work in the London area.

Mr. Bryson entered the service of the Northern District Telephone Company on Feb. 21, 1889, at the age of 21. His early years were spent in the North of England, Sunderland at first, under Mr. C. B. Clay as General Manager of the Northern District Telephone Company, until that company was taken over by the National Telephone Company. In 1896 he was appointed Chief Clerk at Newcastle, and in 1899 came to London as Chief Clerk of the Western District, then under the managership of the late Mr. R. A. Dalzell, C.B.E. When the National Telephone Company's London Districts were amalgamated in 1905 Mr. Bryson was appointed Chief Clerk of the Rentals Department. In 1910 he was appointed to the control of the clerical staff employed at Headquarters taking the inventory of the company's plant.

After the transfer of the Company's business to the Post Office Mr. Bryson was in charge of a section of the accounting work in the London Telephone Service. He was the senior Higher Executive Officer and was frequently called upon to deputise for the Superintendent of his Division.

That Mr. Bryson was popular with all ranks of the staff was amply demonstrated at Cornwall House on the evening of Feb. 28 when, in the presence of a large gathering, he was presented with a silver tea service and salver. In asking Mr. Bryson's acceptance of the gift, Mr Valentine, the Controller of the London Telephone Service, fittingly expressed the affection and esteem in which he was held by all those with whom his official duties had brought him into contact and hoped that he would live for many years to enjoy a well-earned retirement. In thanking Mr. Valentine, Mr. Bryson said that at such a time words were inadequate to express his feelings. He had always endeavoured to do his duty to his employer and the staff, and although retiring from daily contact with his colleagues, he hoped to have many opportunities to meet them in the future.

On Monday, Feb. 25, Mr. Bryson (with whom were Mrs. and Miss Bryson) was entertained by his own immediate staff at a little farewell dinner held at Carr's Restaurant, in the Strand. Mr. J. B. de Lyon presided, and in handing to Mr. Bryson an autograph album containing the signatures and sentiments of his colleagues, assured him that he was carrying into his retirement a love and affection which were more precious than all the gold in the world. The humour of the musical programme, arranged by Mr. Reimann, kept the company in happy mood, and any sadness which might have been felt at the parting with an old and valued colleague was dispelled in hearty laughter. The evening will be long remembered by all who were present.

THE AMERICAN TELEGRAPH SYSTEMS.*

BY G. T. ARCHIBALD.

MOST of those present to-night are probably aware that this paper is the outcome of a recent visit to America, and I should like at the outset to express my indebtedness to the gentlemen with whom I made the trip —Mr. Simon, Mr. Stuart Jones, Lt.-Col. Lee and Mr. Stone—for some of the data which I shall present to you.

We are to deal with the telegraph systems covering a vast continent, where large towns are separated by thousands of miles, as compared with a hundred miles and less in this country, where small communities are separated by very long distances, and where railroad and postal communications are not nearly so frequent as those at home. I mention these points at this stage because they are important in any consideration of the relative positions, from a telegraph point of view of this country and the United States of America.

In America, as you are probably aware, the telegraph and telephone services are conducted by private companies. The telegraph business is controlled by two public corporations, the Western Union Telegraph Company and the Postal Telegraph-Cable Company, and the telephone service by one public corporation the American Telephone & Telegraph Company.

Public control over the activities of the telegraph and telephone companies is vested in the State Public Service Commissions of the various States and by a body called the Inter-State Commerce Commission. Questions affecting a single State are dealt with by the State Commission ; those affecting two or more States are dealt with by the Inter-State Commerce Commission. These Commissions are responsible, amongst other things, for seeing that telegraph and telephone charges are reasonable and that adequate public facilities are provided. Any town or village community may appeal to the State Commission for new or better facilities, and the companies must face the music if they are not prepared to grant such requests.

A tremendous amount of work is thrown upon the companies by these Commissions. The Western Union Company is, I believe, subject to the jurisdiction of 43 Public Service Commissions and 23 Workmen's Compensation or Industrial Commissions. It is required to furnish about 18,000 statements every year, including 3,100 annual reports to taxation authorities, and as taxation is on State lines it is required to show its financial position separately as regards each State.

Before describing the telegraph systems I think it may be worth while to trace the origin and development of the two companies.

The invention of the recording telegraph by Professor Morse in 1832 was responsible for the creation of a large number of short telegraph lines throughout the country, and in 1851 over fifty separate companies, licensed to use Morse patents, were operating in the United States. Other telegraph signalling devices, mostly infringements of the Morse patents, were also in operation. The most important alternative system appears to have been the House printing telegraph, which printed in plain Roman characters instead of dots and dashes. Lines operating this system were in use between New York and Boston and New York and Philadelphia prior to 1850, but about that time a group of Rochester citizens obtained the right to operate it, and in 1851 a company, called the New York and Mississippi Valley Printing Telegraph Company (afterwards the Western Union Telegraph Company), was incorporated under the laws of the State of New York. The company's original intention was to construct a telegraph line from Buffalo to St. Louis, via Louisville. This project had to be abandoned, however, and a line was constructed to Chicago in 1855.

The proposed capital of the company was $360,000, and although special concessions were offered in order to attract the investing public, not more than $170,000 was subscribed.

In the meantime, two rival systems, consisting of 13 different companies, were operating in the five States north of the Ohio River, waging a three-cornered fight with each other and with the New York and Mississippi Valley Company. The service was unreliable, and the financial condition of the Morse companies led them to approach their rival with offers of sale and consolidation. Satisfactory terms were arranged, and following the elimination of duplication and wasteful competition the new company made great strides. In April, 1856, its name was changed by Act of the New York State Legislature to Western Union Telegraph Company, and in December, 1857, the Company paid its first dividend.

During the next four years the business was extended to cover the States of New York and Pennsylvania, the Atlantic and Gulf States, a few Middle West States, the Southern Mississippi Valley and the South-West. In 1861, following an urgent demand for quicker communication with the Pacific Coast, Congress voted an appropriation of $40,000 a year for 10 years, under certain conditions, for the building of a telegraph line east and west. A convention of telegraph companies called in 1860 voted the Act objectionable on account of its restrictions, but the Western Union Telegraph Company took a different view and, acting independently, undertook to build the line, which was completed in 1861. In 15 years the company increased its wire mileage from 550 miles to 75,000 miles.

* Paper read before the London Telephone and Telegraph Society.

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In 1911 the business was purchased by the American Telephone and Telegraph Company, but the combination was declared to be a breach of the Anti-Trust Laws and dissolved. The company, now incorporated under Federal laws, has its headquarters in New York, sharing with the American Telephone and Telegraph Company the occupation of 195, Broadway. There is now in process of erection a magnificent new building which it is hoped to complete in 1930. The new premises are estimated to cost $13,000,000. The building will be 400 feet in height, contain 24 floors and house the whole of the headquarters staff and the New York Main Telegraph Office and the Cable Office.

The company has contracts with all railway companies both for wayleaves and telegraph facilities, so that with its own offices and those of the railway companies it now serves about 25,000 places in the United States. In addition, and by agreement with the various interests involved, the company has connexion with all telegraph offices in Canada and Mexico.

Control of the company is vested in a board of 21 directors to whom the president, or general manager—who is himself a director—is responsible for management. The president, Mr. Newcomb Carlton, was at one time associated with the British Westinghouse Company, both in Manchester and in London. He is assisted by five vice-presidents, in charge of the commercial, traffic, plant, engineering and accounting departments respectively, and a general solicitor.

The senior vice-president is in charge of the commercial department. He is responsible for all public relations, development of business, collection and delivery of telegrams, provision of facilities at all offices, and for the staffing of instrument rooms, maintenance of apparatus, &c, at all offices other than those under the control of the vice-president traffic department.

The vice-president of the traffic department is responsible for the disposal of telegrams at what are called functional offices, i.e., offices at which the operating room requires separate supervision, for the maintenance of apparatus and for the economical working of those offices.

The vice-president of the plant department is responsible for the construction and maintenance of lines, tubes, carriers, power plant, &c., and for the supply and installation of internal apparatus, but not for its maintenance.

The vice-president of the engineering department is responsible for all research work relating to internal and external plant, for the testing of new types of apparatus and for the study of new methods.

The vice-president of the accounting department is responsible for the proper accounting, checking and auditing of the company's funds.

The general solicitor is responsible for such legal work as may be necessary.

Each vice-president is accountable directly to the president of the company for the work of his department. There is, necessarily, close co-operation between the various departments, but where the interests of two or more conflict the vice-presidents attempt to arrive at some measure of agreement. In the last resort the decision of the president, to whom all such differences must be referred, is final.

For the purpose of local control the territory served by the company is divided into eight districts, in all of which the various departments, except the engineering and law departments, are represented; the commercial department by a general manager, the traffic department by a division traffic superintendent, the plant department by a division plant superintendent and the accounting department by a division auditor. Each of these officers maintains a separate and district organisation and is directly responsible to the vice-president concerned.

The operating procedure laid down by the traffic department is common to all offices, whether functional or non-functional.

The story of the Postal Telegraph-Cable Company is not without interest, for it is closely identified with the story of John W. Mackay. Mackay, after amassing great wealth in gold and silver mining, sighed for other worlds to conquer, and in 1883 James Gordon Bennett, owner of the *New York Herald*, very dissatisfied with the poor cable and telegraphic service, was successful in obtaining Mackay's interest.

In 1881 the Western Union Telegraph Company, under Jay Gould, had acquired control of most of the commercial telegraph lines in the United States. A number of small companies carried on for a few years, including the original "postal" companies. The Western Union Company had secured the best routes for land lines; new rights of way were difficult to obtain and were generally very expensive, there was in operation a system of reduced rates and rebates which could not be given by any small company without considerable loss and the telephone was beginning to develop as a medium of more than local communication.

It would seem that the telegraph service in America was not at that time very efficient. Mackay threw his energy and wealth into the fight for a better telegraph service. After making a careful study of communication he decided to attack the Gould combination on both cable and land lines, and in 1884 his cable company—the Commercial—commenced operations. He reduced the rate between the United States and London from 40 cents to 25 cents per word. A rate war ensued, but the older company could make no impression on its rival and the war was discontinued.

After completing his cable scheme Mackay turned his attention to the land line system, and decided after examining the possibilities of the few remaining independent companies to use the Postal Telegraph Company as the nucleus of his land line system. The origin of the name of the company is interesting. In 1870, probably as the result of the purchase by the State of the telegraph companies in this country, there was considerable agitation for State control of the American telegraph service, and it is popularly believed by American telegraph officials that the name Postal Telegraph was adopted in order to obtain favour from those who desired Government control of the telegraph business.

Mackay's new company, known as the Postal Telegraph-Cable Company, was incorporated in 1886. He gathered under his wing a number of the impoverished independent companies, consolidated their facilities and personnel, standardised operations and placed them on a more efficient basis. Concurrently he set about the task of increasing the ramifications of the company. He entered into working agreement with the Canadian Pacific Railway Company which gave him access to the Far West, and gradually the system was extended until, at the present time, thanks to the energies of Mr. Clarence Mackay and his assistants, the company has 300,000 miles of land line and serves 2,300 offices in the United States. It has connecting links with 1,520 offices in Canada and can reach 35,000 places in America by telephone. It competes with the Western Union Telegraph Company only in those places where both services can be maintained without loss.

A few months ago control of the Postal Telegraph-Cable Company passed into the hands of the International Telephone and Telegraph Company, and the business is now in process of reorganisation under the management of Colonel A. H. Griswold, executive vice-president.

Finance.—In 1927 the Western Union receipts amounted to $131,771,003, operating costs reached $115,846,032, pensions, sick and annual leave, and death benefits totalled $3,700,000, and $1,080,624 were distributed under the Income Participation Scheme, about which I shall have something to say later on. The Company employed 62,820 persons during the year, of whom 14,220 were messengers.

The average toll per telegram was 68.38 cents; the average number of chargeable words per telegram was 13.45 and the average number of free words including preamble was 15.14. The total number of telegrams and day-and-night letters handled was about 172,000,000 and 3,840,544 telegraph money orders, or transfers as they are called in America. The amount of money transferred by wire amounted to the stupendous sum of $236,532,679.

During the same period the revenue of the Postal Telegraph Company amounted to $26,730,523 against an operating expenditure of $22,691,232. Payments on account of sickness and death benefits reached $106,048. There was no charge for annual leave, a point which will be referred to later. The company employed 15,695 persons, of whom 4,750 were messengers.

The average number of paid words in day-rate telegrams was 15 words and 14 words including preamble were transmitted free of charge. The company handled 35,593,000 messages, 65% of which were fully paid day telegrams and 250,646 telegraph money orders, transferring $18,522,154.

Tariffs.—Under an Act of Congress telegraph companies carrying on an inter-State business are declared to be common carriers. As such they are prohibited from discriminating in rates of service and are liable to a penalty of not less than one hundred dollars, and not more than 2,000 dollars, for directly or indirectly giving free service of any kind to persons other than those specifically enumerated in the Act.

The rates charged by the two companies are the same except that the Western Union Company continues to charge an addition of 20% on intra-State as distinct from inter-State traffic, which was imposed on all domestic or inland telegrams during the war.

The unit of charge is 10 words, the address and signature being transmitted free of charge. Abbreviated addresses are not used in the United States inland service. There are three rates:—

(1) The urban rate of 24 cents for 10 words which applies only to telegrams within the same town or city.

(2) A rate described as the "square rate." The country is divided into 50-mile squares and the rate is calculated according to the distance between the square of the office of origin and that of the office of destination. Square rates are not applied to telegrams for places separated by more than four squares from the office of origin. The State rate applies beyond that limit as well as in cases within that limit, where it is lower than the square rate. A rate-sheet combined with a tariff book enables the counter clerk and accounting staff to ascertain the correct tariff without loss of time. There are three groups of square rates—30, 36, and 48 cents for 10 words, less 20% in the case of the Postal Telegraph Company.

(3) The State or long-distance rate which is fixed according to States, which are grouped in zones. In New Jersey, for example, there are five zones and the rates are 48, 60, 72, 90, and 120 cents respectively for 10 words.

Lower rates are charged for night telegrams, the charge for long-distance night telegrams being 55% lower than that for day telegrams.

Government telegrams are charged at 40% of the ordinary tariff and the companies lose money on these transactions.

A day letter of 50 words costs one and a half times the ordinary rate for 10 words: a night letter of 50 words is charged at the ordinary day rate for 10 words. Press messages are charged at one-third of the ordinary rate during the day period and one-sixth of that rate during the night period.

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Traffic.—There are four principal classes of traffic, day telegrams and night telegrams, and day letters and night letters. Under the Western Union Company's system 70% of the traffic is day telegrams, 5.5% night telegrams, 8.5% day letters, and 16% night letters. The night letter traffic is being affected by an air mail service which the Post Office has recently inaugurated.

" *Greetings* " *Telegrams.*—Both companies cater for " greetings " telegrams, charged for at the ordinary rate. The messages are typed on specially designed forms and enclosed in distinctive envelopes.

An analysis recently completed by the statistical department of the Western Union Telegraph Company reveals a stupendous increase in the number of telegrams dispatched annually as greetings. Growing from a comparatively small number at Christmas and New Year's, the custom of sending greetings over the wire has now spread until it includes Valentine's Day, Easter, Mother's Day, Father's Day, and Thanksgiving. The volume of greetings over the Western Union wires increased approximately 65% in 1927 over 1926, and it was estimated that this year more than 200,000 greetings messages would be handled by the company during the Christmas holidays.

Total Traffic.—About 204,000,000 telegrams and day and night letters are dealt with annually by the companies. The Western Union Company obtains about 82% of the total, but it has to be remembered that, at present, it has practically a monopoly in regard to small office traffic.

Competition.—There is keen competition between the two companies for traffic of all kinds. Both are prepared to install on the premises of a customer who originates above five dollars-worth of business monthly a call box or pick-up signalling apparatus, which is connected to the delivery room of the nearest office. As many as 120 customers may be accommodated on a single circuit—the average is about 80—and each is allotted a numerical signal which he taps out on a push button or key. The signal is sent twice in order to reduce the risk of error, and is received at the delivery office both on a bell and on a tape machine. The clerk in charge, who is provided with a card index containing the name and address of each caller, records these particulars on a docket and passes it to the first waiting messenger.

About 258,000 of these calling machines have been installed by the Western Union Company and 184,000 by the Postal Telegraph Company, of which 49,000 and 40,000 respectively are in New York. In large numbers of cases both companies install the apparatus in the same premises. Both are called at the same time, when it is known that the traffic of destination can be reached by both systems, with the result that the boy who arrives first gets the message. That is why Western Union forms are seen so frequently in Postal Telegraph Offices and *vice versa*. Collection is given priority over delivery.

About 80% of the total traffic is picked up by messengers.

The companies also provide, free of charge, private wire facilities telephone, morse, or teleprinter between the premises of large users and their transmitting offices.

In London we are accustomed to the sight of a Lyons tea shop and an A.B.C. tea shop in close proximity to each other. In America, if you are interested in telegraph business you look for a Western Union Branch Office whenever you see a Postal Telegraph Branch Office. These branch offices seem to be scattered about with great prodigality. In the windows are displayed pieces of new and old apparatus and attractive posters. Inside everything is done to make the sending of a telegram as easy as possible. Comfortable chairs and neat writing tables with forms of all kinds and decent pens and pencils in plenty are provided; at some of the larger offices a typewriter is at the disposal of customers.

The counter clerks are carefully trained, and I have little doubt that they sometimes persuade people to send telegrams which they would otherwise leave unsent. The story is told of a fond young father who wanted to advise his mother-in-law that she had become a grandmother. The counter clerk with an eye to business asked if this was the firstborn. The reply being in the affirmative he proceeded to suggest that other members of both families might be interested, and was rewarded by another eight telegrams.

Canvassers are employed by both companies. If a customer fails to reply to a telegram which obviously requires a reply, a canvasser calls next day and points out that a reply has not been sent. Sometimes he finds that the boy from the rival company got there first.

A branch office is usually to be found in large hotels and in some cases both companies are represented. As a general rule the offices are side by side, divided by a thin partition. The hotel companies stipulate that the offices shall remain open until a late hour and that attractive young ladies—up to the hotel standard—are employed as counter clerks. I did not learn whether the companies hold beauty competitions, but I can testify to the taste of the officers responsible for the choice of hotel telegraphists.

The Postal Telegraph Company is at a serious disadvantage as compared with its rival. Large numbers of young people from country districts obtain employment in the big towns with no knowledge of any telegraph system other than that operated at the railroad station of their home towns—the Western Union. Naturally, when called upon to send a telegram they think first of the Western Union. To combat this the Postal Telegraph people are considering the possibility of persuading commercial colleagues to use Postal Telegraph forms in their training schemes.

Counter Acceptance.—It is worthy of note that the sender of a telegram may request the company to collect the cost from the addressee, that practically 90% of the traffic is accepted without prepayment, and that there is no charge for account keeping.

Relations with Staff.—Both companies are firmly opposed to trade unionism amongst their employees. They take the line that the telegraph service is a public utility and as such should not be influenced by the trade union movement. The Postal Telegraph-Cable Company, on the one hand, requires every applicant for employment to sign a declaration that he or she is not a member of any trade union and will not become a member of any similar organisation, hostile to the company, while in its employ.

The Western Union Company, on the other hand, has encouraged the formation of an association amongst its employees. Supervising and operating grades are included in the association but the former apparently take no part in its activities. Local and divisional committees elected by the members negotiate with the company's local officials, whilst its central committee negotiates with vice-presidents, &c. No member of the central committee may be dismissed without the consent of the president of the company.

An annual conference between the vice-presidents and the principal officers of the association is held at the head office for the discussion of various questions relating mainly to pay and conditions of service. In cases of disagreement the association has access to the president, who does not usually attend the conference.

Recruitment.—An employment bureau is maintained by the Western Union Company at every large office. Candidates are interviewed and full enquiry is made into the antecedents of those who appear to be suitable for employment.

Before a boy or a girl is engaged an officer of the company visits the candidate's parents and satisfies himself that the home environment is up to the standard required by the company.

Boys and girls who have reached a moderate educational standard are employed as messengers and routing aides (collectors and distributors), and these may in the course of time become routing clerks (circulators), clerks, or tube attendants, their promotions depending largely upon their education and ability.

The company's officers consider that a fairly high educational standard is necessary for operating classes and, as a rule, girls and boys leaving school at 18 years of age are preferred. No educational examination is imposed, but every boy and girl candidate for employment as a clerk or telegraphist is required to pass certain intelligence tests and in the case of phonogram operators and keyboard operators digital and auditory tests. The digital tests is interesting. It is designed to test control of the fingers and those co-ordinations of hand, eye and mind essential to efficient keyboard operation by the touch method. Some means of selecting for that work those possessing natural finger dexterity, ability to sustain vision on copy, and the mental alertness required for rapid and accurate transmission is essential in modern telegraph operation, and an instrument known as the digitometer has been designed to meet that need. A metronome is placed in circuit with the instrument and the figures appearing on the disc change with each beat. The metronome is started at 30 dial changes per minute, increasing by 5 until a maximum of 50 is reached. The candidate is required to type the figures as they appear on the disc. The results are recorded and checked. No candidate who fails to pass this test is considered suitable.

It is recognised, too, that ability to read script and detect errors in messages is also important and specific tests are given.

It is claimed by the company's officers that the tests enable them to select the best-fitted candidates, that only in a very small number of cases has the subsequent performance of the learners failed to justify their selection and that they have been a factor in the improved performance of operators.

At one time all new entrants were paid at the rate of $60 per month on entering the telegraph school. Many learners resigned after qualifying in touch typing in order to accept better positions as typists, &c., elsewhere, and it is now the practice to make no payment during the first three months' service, except in those cases where learners have to leave their homes for instruction. This arrangement has greatly reduced the number of resignations but has had the effect of reducing by about four weeks the time occupied in training. It has also had the surprising effect of attracting a more suitable type of employee.

Owing to the great development in recent years of type keyboard operating training in morse telegraphy has ceased. Fully-trained morse operators are now difficult to obtain and the question of training a limited number of sounder operators is under consideration.

Applications from fully qualified operators for employment as telegraphists are considered at all times and suitable men and women are engaged at the rate of pay appropriate to their qualifications.

Clerical Staff.—The minimum age for employment on clerical work is 17. Applicants with high-school qualifications are preferred, but promising candidates of good appearance and address with only the highest grade elementary school qualifications are sometimes accepted. Clerical appointments are also given to routing aides who appear to be suitable for the work.

(*To be continued.*)

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COMMISSION CONTROL OF PUBLIC UTILITY SERVICES.*

BY A. J. WALDEGRAVE, ESQ., M.B.E.

(*Continued from page* 115.)

AN idea of the kind of cases which come before the Commissions and the kind of treatment which they receive will perhaps best be gained by looking at a few actual telephone cases. But first let it be remembered that telephones are only one of the classes of public utilities with which the Commissions deal. In the State of Indiana, for example (for which I happen to have the figures), there are 1,376 different public utility companies coming under the jurisdiction of the State Commission. These comprise, besides telephone utilities, steam railroads, electric railroads, water, heat, gas and electric utilities and bus companies. I ought, perhaps, to point out that, generally speaking, local undertakings, as well as those operating in wider areas, come under the jurisdiction of the State Commission and are not subject to the control of the city authority: indeed, a case coming before a Commission usually consists in a dispute between the city or other local authority and the Company. But to go into the reasons for this would take us too far into the subject of American local government.

Let us now try to gain an idea of the actual functioning of the Commissions from a few typical telephone cases as briefly reported for the information of those engaged in the telephone industry. These reports I have taken from *Telephony*, the weekly organ of the independent telephone companies, that is, the companies outside the Bell organisation, otherwise known as the American Telephone & Telegraph Company. A monthly summary of the proceedings of the Commissions in telephone cases is, I might mention, issued by the A.T. & T. Co., and it runs to two or three hundred pages.

Here is a case of rate increase:—

"The Oklahoma Corporation Commission recently granted the application of the Oklahoma Telephone Company for an increase of telephone rates at Broken Arrow, which become effective after an automatic exchange is installed. Old and new rates of the company (monthly flat rates) are:—

	Old.	*New.*
	$	$
Business, individual line ...	3.00	4.25
Business, two-party	2.50	3.75
Business, extension line ...	1.00	1.00
Residence, individual	1.75	2.50
Residence, two-party	1.50	2.00
Residence, four-party	—	1.75
Residence, extension	.75	.75

"The application for an increase was supported by petitions filed by 70% of the subscribers in Broken Arrow, also by petitions from the city council. Citizens agreed to pay the higher rates when an automatic exchange is installed by the Oklahoma Telephone Co."

Here is a case of appeal from a refusal of a Commission to allow an increase of rates:—

"Officials of the Southern Indiana Telephone & Telegraph Co., which was denied a rate increase for service at Bicknell, just before Christmas, have informed the Indiana Public Service Commission that they will appeal from the decision to the Jackson circuit court. A transcript of the evidence in the case will be filed with the circuit court, which, under the utility statutes, has jurisdiction as a court of appeal.

"Notice of the appeal alleged that the public service commission ruling was 'arbitrary, capricious and unreasonable.'

"In making the ruling the Commission stated that the utility should not receive a rate increase because all other business in Bicknell is in a bad condition and the company should be willing to be regulated by general conditions. The conditions arise from the fact that the coal mines are not working, leaving many unemployed."

Here is another case of appeal from the order of a Commission, but on a much bigger scale:—

"Voluminous briefs, covering every aspect of the telephone rate litigation in progress in the federal courts for the past four years, were filed last week by the New York Telephone Co., the New York Public Service Commission, the city of New York and the Attorney-General. Special Master Isaac R. Oeland, who was named by a federal statutory court four years ago to hear testimony on the company's charge that public service commission rates established in 1923 were confiscatory, heard oral arguments this week.

"The company, whose New York State rates are involved in the litigation, began its federal suit on April 25, 1924. Hearings before Mr. Oeland started Oct. 14, 1924, and continued until Sept. 10, 1928. There were 710 separate hearings, in the course of which 3,288 exhibits were put in evidence and 36,532 pages of testimony recorded. . . .

"The New York Telephone Co., shortly after beginning its suit in 1924, obtained from the federal court an order permitting it to make a surcharge of 10% over the rates established by the Commission in 1923. In May, 1926, the Commission, after further hearings, allowed the company to retain this surcharge and to make additional rate raises which increased the company's revenue about $9,111,378 a year. The company, dissatisfied with the additional increase, insisted that it was entitled to a return of 8% on its investment, requiring an annual increase of $13,601,555. . . .

"The joint brief of the Commission and the Attorney-General attacks the company's bases for computing valuation and return on its property and asserts that to sustain them would make available for holders of the company's common stock a dividend of 21%. . . .

"The company's brief declares that the value of its entire telephone property in the State on July 1, 1928, was at least $749,947,119. In their briefs the Commission, the Attorney-General, and the city oppose the company's contention that 'going value' be included in the rate base. This item was excluded by the Commission in granting the rate increases of 1928."

If the Commissions sometimes deal with cases involving enormous sums and important issues they at other times have to bend their minds to smaller matters. For example, the Nebraska Commission had recently to deal with an application from a Mr. A. J. Haines, a subscriber of the Curtis Telephone Co., who asked for an order to have his telephone connected again.

He said that it was cut off because he protested against the long waits for connexions and because his complaints against the sauciness of the central operator turned out to be complaints against the manager's wife. The report proceeds: "Mr. Haines insists that, as a matter of fact, the manager's wife *is* saucy to patrons, and he is not the only one who doesn't like the situation."

It is difficult without occupying an undue amount of time to give a summary of enough cases to convey an adequate impression of the variety and magnitude of the operations of the Commissions. Perhaps it will help if a few headlines with the descriptive touch which the American journalist gives to them are quoted. Here are the headlines to the cases which receive special mention in one recent issue of *Telephony*: "Radio Monopoly Charge Dismissed by Federal Commission"; "Extension of Chicago Franchise of Illinois Bell Company"; "Injunction Suit against Indiana Commission Order Dismissed"; "Appeals from Indiana Commission Order Authorising Competition"; "Commission Refuses to Abolish 'Free' Exchange Service"; "Asks Connecting Lines to Move Because of Induction"; "Kansas Farmer Line Objects to Telephone Pole Rental"; "City Attorney of Louisville, Ky., Believes Increase Justified"; "Michigan Commission Gives Approval of Consolidation"; "Rate Application Shows Property Depreciation at Bloomfield, Neb."; "Ohio Central Company Collects Increased Rates under Bond"; "Changes Recommended in Nebraska Compensation Law"; "Portland, Oregon, Seeks to Force Bill to Accept Franchise"; and, lastly, "Pacific Company Submits New Franchise to Settle Dispute."

A word as to the cost of the activities of the Commissions, the extent of which I have thus tried to indicate. (Again let me remind you that telephone cases constitute only a section of their work.) The total cost of the Commissions is in the neighbourhood of $12,000,000 per annum, say, £2,500,000, and this does not include the expenses of the companies or of city authorities and others concerned in the cases. It is a large sum, but after all it amounts only to £1 per £1,000 of the revenue collected by the public utilities of America; and it does not seem improbable that the community would find the cost of the public utility services increased by more than £1 in a thousand if the safeguards against the exactions of monopoly and the wastefulness of competition in such services were withdrawn.

Approximately one-half of the total cost of the system is in respect of the federal Commission known as the Interstate Commerce Commission, with its headquarters at Washington, about which I have not so far said anything except by casual reference, but which is an important feature of the system.

As we have seen, the separate States of the Union have independent jurisdiction over undertakings operating within their own territory and neither the central Government nor any other individual State has power to interfere in the relations between a company and the State within which it operates. It is interesting to note, though it breaks the thread of our story, that this self-contained nature of the relations between a State and the companies operating within it gave birth to an institution of the financial world which in recent years has undergone great developments quite outside the circumstances in which it had its immediate origin. I refer to the "holding company." This device was invented to enable financiers in one State, say New York, to control companies in other States.

The American Telephone & Telegraph Co. is a holding company of this kind so far as local services are concerned; it holds the majority of the shares in operating telephone companies in most of the States but it has no legal standing in those States.

When, however, we come to services like the trunk telephones ("tolls," as they call them in America) and, more important, the trunk railway system, we transcend the boundaries of the separate States and find ourselves in the federal region and encounter the organisation set up by the United States Government itself to control in the general interest the public utilities of an inter-State character.

The Interstate Commerce Commission was set up in 1887. In 1906 its powers were greatly strengthened and in 1920 the Transportation Act consolidated and further enlarged its powers. There are eleven Commissioners; they are appointed by the President, and their term of office runs to seven years, with the possibility of reappointment. Each Commissioner receives a salary of $12,000 (say £2,500) a year, and together they direct a staff of about 1,700 officers—a big semi-judicial, semi-administrative department, exercising functions in connexion with transport and communication analogous to those divided in this country between the Railway and Canal Commission,

* Paper read to the Post Office Telephone and Telegraph Society of London.

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the Board of Trade, the Ministry of Transport and the Post Office. It is interesting to see that a bill is to be introduced into the next session of Congress setting up a separate Commission, to be called the Federal Communications Commission, to control the transmission of intelligence by telegraph, telephone, cable and radio.

As might be expected, the Interstate Commerce Commission, from the quality of its personnel and from the magnitude of the interests with which it deals, holds a place of outstanding interest and importance in the system of Commission control; but it commands no more authority in the legal and constitutional system than does one of the State Commissions. Its decisions and orders may be regarded as *prima facie* worthy of great respect, but they are equally liable to challenge in the courts; and on some vital issues in the matter of rate-fixing appeals from orders of the Commission are at the present time in process of hearing.

In fixing the "fair value" of a public utility on which there is to be a "fair return" it is necessary to arrive at what the Americans call the rate-base, that is the current valuation of the property. The higher this valuation the higher the rates must be. And the agreeing of principles which shall govern the fixing of the rate-base is by no means a simple matter. Should the valuation be the capital expenditure as recorded in the books of the Company, notwithstanding that this may have been inflated by unwise or even corrupt speculation? Should regard be paid to legitimate expenditure on pioneer work, and if so, should a difference be made according as this expenditure has been well or ill recouped? Should allowance be made for goodwill, when this goodwill may consist in the expectation of continuance of high rates? Has the company a right to a return on capital which has been provided out of past revenue?

Again, how about the changes in money-values and in prices which have been so enormously aggravated by the Great War? Ought the man who invested say a thousand pounds in plant before the war, expecting a return of 4%, to be allowed to force up public rates on the ground that similar plant is now worth £1,750, and that a return of 7% is worth no more than a pre-war return of 4%? (These are, of course, two quite distinct questions: the answer to the one might be, No; and to the other, Yes.)

Yet again, how about depreciation? Should a public utility be compelled to provide for depreciation on a systematic basis (and, if so, what basis?) or allowed to adopt an opportunist policy in the matter? And if money which should have been set aside for depreciation has been distributed in dividends, should this be taken into account in fixing a new rate-base?

"And when the rate-base has been fixed there still remains the question, What would be a reasonable return to allow on it—5, 6, 7, or what higher percentage? Where is the line to be drawn and upon what principle?

It is not surprising that with questions like these waiting to be answered the Commission system finds itself involved in seemingly endless litigation. But meanwhile the public utilities must be carried on, and practical, if provisional, solution of the tariff difficulties must be found. In practically all cases since the war, revision of rates has meant revision upwards, for this has been necessary in order to enable the companies to remain solvent and to attract fresh capital for the extension of business. As a result, there are not wanting indications that the confidence of the public in the Commissions as instruments for the protection of the consumer is being weakened. Thus, a correspondent, writing in to a recent number of *Telephony*, says: "Most Commissions are viewed with mistrust by the public because for the last ten years conditions have forced them to give relief to the service companies."

In a paper, entitled "What is Wrong with Regulation in Indiana?" which was read by Mr. Harvey Harmon, one of the Public Service Commissioners of Indiana, at a meeting of the Utilities Association of the State last July, he said:—

"During the primary campaign which is now in progress and which is not as yet settled, at least eight candidates for Governor on both the Republican and Democratic tickets declared themselves either for the abolishment of the Public Service Commission or substantial changes in the law."

Mr. Harmon goes on to attribute the discontent largely to the increases in telephone rates which the Commission has been forced to concede, increases resulting largely from a wave of speculation in telephone undertakings. He says "Two-thirds of the telephone industries in the State are in rural communities and whenever an increase of rates is asked the people in those districts where the increase is sought, know about it instantly and resent it at once. The telephone itself is used to discuss the injustice done." Mr. Harmon proceeds to argue that it would be very foolish of the public to allow their disappointment and dissatisfaction to lead them to abolish the Commission. He points out that, after all, it is significant that every appeal against orders of the Commission has so far been taken by utilities and says "Nor do I know of a single case where resort has been made to the Federal Court by dissatisfied consumers."

If there are complaints that the Commissions are failing to perform adequately their duty of protecting the public, there are, on the other side, complaints that they are harsh and oppressive in their treatment of the Companies. One can read this kind of complaint in some recent remarks by the Governor of Illinois in which he says "The purpose of public utility regulation is to provide ample protection for the public from exorbitant rates or insufficient or unsatisfactory service. This purpose is not served by hampering development of utility companies or by preventing their earning a fair return on investment. Regulatory supervision and laws which cripple utilities are no more in the interest of the public good than are those which give to corporations an undue advantage in service or charges."

It is easy to see from such expressions of dissatisfaction as I have quoted, and indeed from the reports of the proceedings of the Commissions, that it would be a great mistake to suppose that the American Public Utility Commissions constitute anything like a perfect and smooth-working machine for adjusting the differences between public and private interest and for guaranteeing to the community, on principles firmly established, ideal public services. What one sees is that in the day-by-day handling of the cases which come before them, the Commissioners are proceeding along empirical lines, treating cases on their merits, compromising, adjusting, taking leaps in the obscure, pushing off difficulties with the knowledge that they will come back—in a word, trying as practical men to make arrangements which will work in the immediate future with a minimum of injustice to the public and of inconvenience to the companies. When it is considered that there are forty-seven or more Commissions, each working in this spirit, it is not to be wondered at that there are differences and inconsistencies in their various decisions and orders. The only provision for co-ordination among the Commissions is a National Association of Railroad and Public Utility Commissioners, which the Commissioners may join in their individual capacity, and which holds an annual convention where topics of common interest are discussed in a useful but entirely unofficial way.

Meanwhile, the fundamental questions of principle, which after all must be discovered and adopted as bases of action if the system is to be anything better than a hand-to-mouth affair, are being hammered out by the slow process of American judicial procedure; and sooner or later it will be established by law whether the proper basis of valuation is reproduction cost new, whether a company is entitled to an allowance for going value, whether accrued depreciation which has been provided for out of revenue should enter into the rate-base, and so forth. But the law's delays are America's one indulgence in the luxurious leisure of the older civilisations.

I cannot resist the temptation to give one more of the brief reports in *Telephony*; it appears in the issue of Dec. 8, 1928, and runs thus:

"*Hearing in Ohio Bell State-Wide Case Indefinitely Postponed.*—The investigation of the valuation of the Ohio Bell Telephone Company for rate-making purposes on Nov. 26 was postponed indefinitely. . . . The Attorney-General had asked the Company to furnish certain data on central office equipment, but that has not been furnished, because as the Company said, the only man who could give the information is seriously ill in a Columbus hospital with an eye complaint. The investigation started in 1925."

It has no doubt occurred to some of my audience to ask whether, if public utilities are to be in the hands of private enterprise, with provisions, however, against the exploitation of the public's necessity and of the monopolistic conditions, it is not better to impose all the necessary conditions in advance, rather than leave control of the safeguards to a Commission on the American model? The reply, I think, is, that such a course is preferable—to the extent that the questions which will arise can be foreseen and provided for. But there is serious difficulty in anticipating the conditions which will arise. Looking backwards we can see how vital changes have taken place in practically all the public utilities, changes which could not have been foreseen at their inception. And can we expect that it will be otherwise in the future? However completely provision may be made for automatic adaptation to the fluctuation or development of circumstances, it seems desirable that there should also be provision for a live and continuous representation of the public interest with which the undertaking is affected.

It is to be expected that as the fundamental questions which have been raised in connexion with the American Commissions become settled, and a body of firm and accepted principle gets established, the Commissions will undergo a change in character and function. The probability is that they will become less judicial and more administrative in the kind of superintendence which they exercise. Administrative bodies in the true sense, however, they cannot be. We speak rather loosely, as in the title of this paper, of Commission *Control* of Public Utilities, but no undertaking can really be controlled into efficiency and economy from outside. Efficiency and economy are essentially internal affairs; and although the American Commissions are supposed to have power to control quality of service, their achievements in this direction are insignificant. Assistance to control can, however, be given by well-informed criticism from without and the administration ought always to be subject to assistance of this kind at the hands of accountants and others. The American Commissions have all along been alive to the value of statistics and accounts in obtaining a proper service of the public and have done excellent work in prescribing forms of account and returns of operating. No doubt they will continue to render useful service in this way, whatever other lines of development they may follow.

There is one interesting and important development which has already taken place in the public utility world in America which is not unconnected, one must suppose, with the assertion of the public interest in utilities and the existence of organised provision for the expression of that interest. The American Telephone & Telegraph Co. has formally declared, and takes occasion from time to time to repeat the declaration, that beyond the moderate return on capital which it at present enjoys it does not seek for profit, but will devote to the public all the advantages which may accrue from improvements in organisation and in technical development; and those of us who have the privilege of contact with the officials of the company know that they are directing its affairs in the spirit of that declaration. Definite recognition in this manner of responsibility to the public, if it should spread among public utility companies generally, would perhaps be hailed as so great a triumph that the Commissions might be expected to sing "*Nunc Dimittis*" and depart. But to any such suggestion that the Commissions were no longer necessary the warier part of the American public would, I expect, reply in the words of an American bishop used in another connexion. "Yes," said the bishop, "we know that the wicked fleeth when no man pursueth, but he goes faster if there's someone behind him."

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RETIREMENT OF MR. McILROY.

ON Mar. 31 there passed out of the Post Office Engineering Department one whose loss will be severely felt. Outwardly he was somewhat reserved, and therefore not fully understood by those who only came into occasional contact with him, but those who were fortunate enough to penetrate beyond this outward appearance of reserve found that they had discovered one of the most delightful men it was possible to meet.

It is difficult to say what was the most outstanding feature of his character. Some would lay emphasis on his absolute integrity and strong sense of justice. Others were most impressed by his imperturbability which disasters could not disturb but only bring into greater prominence. This imperturbability was not lethargy, as he would immediately, but quite calmly, begin the organisation of relief measures. Still others are inclined to lay stress on the generosity with which he responded to an appeal to support any good cause; and some emphasise the wide extent of his reading, especially history, comparative religion and travel.

Mr. McIlroy had a knowledge of the organisation of the Engineering Department such as is possessed by few other men, and he was a mine of information on such subjects as the Telegraph Acts, and the pay, responsibilities, and duties of all grades of staff employed. This information was readily imparted to those who sought his assistance and advice, and was expressed in such a way that one felt as if the opinions were those of a great jurist who had considered every phase of the subject and whose advice could therefore be accepted with absolute confidence.

Mr. McIlroy commenced his service in the Engineering Department in Ireland in the year 1891. After two years at Belfast he was transferred to London and, as soon as his talent became known was selected by Mr. Hookey, who was then the Assistant Engineer-in-Chief, to be his private secretary. Mr. McIlroy remained with Mr. Hookey when the latter became Engineer-in-Chief. Those who remember Mr. Hookey will know that he was a tremendous worker, and tried to keep abreast of everything that was being done in the Engineering Department. This threw a great deal of work of all description upon his secretary who had to assimilate a vast amount of information on all sorts of subjects so that it could be presented in suitable form to his chief. During this period the Trunk circuits were surveyed, valued, and purchased by the Post Office, and the backbone system of underground cables to the Provinces was initiated. Some revolutionary changes in methods of construction were also being investigated and tried out. Negotiations were in hand with the Railway Companies regarding the construction and maintenance of telegraph wires on railway property. Mr. McIlroy took a very active part in all these matters. After the retirement of Mr. Hookey, Mr. McIlroy was transferred as Assistant Superintending Engineer to the Metropolitan (South) District which was formed when the Post Office embarked upon the provision of a telephone system for London. After four years he returned to the Engineer-in-Chief's Office as Staff Engineer in charge of the Construction Section. Here he remained for about 18 months, and characteristically used the opportunity to standardise the construction methods for external work and to issue printed and bound instructions which were accessible to everyone who might be engaged upon that class of work.

In 1909 Mr. McIlroy was transferred to Cardiff as Superintending Engineer of the South Wales District, and his period of service there is looked back upon with pleasure by all those who worked under him.

In August, 1921, he succeeded Mr. Moir as Superintending Engineer of the London Engineering District, in which position he remained until the end of his official career. They have been strenuous years. At the time of his arrival the shortage of line plant and equipment occasioned by the war was still acute, and many thousands of applications for telephone service had to be refused. Moreover, the change from manual to automatic working was in contemplation, involving a fundamental revision of the layout of the area. These two matters had to be dealt with together. Service was to be provided for all the present and prospective applicants, and the plant was to be provided in such a way that although service on the manual exchanges would be given, there would be no appreciable line plant wastage when the conversion to automatic working took place. That service for all applicants was provided in so short a time was due in no small measure to the personality of Mr. McIlroy. He possessed in a supreme degree the faculty of getting the best out of the staff. He trusted them and let them see that he trusted them. He did not worry about details, and at the same time showed that he was ready to discuss any problem that was brought to him.

Mr. McIlroy was always ready to give credit for good work and, even if this work originated in a suggestion of his own, he would not take any of the credit. When he was given the honour of I.S.O. he said that he could not see what he had done to deserve it, and the honour was due to the staff of which he had the good fortune to be the head. Is it any wonder that when he left the District there was profound regret? He has, however, taken with him fervent wishes that his years of retirement may be long, healthy, and happy.

One thing he cannot take away—nor would he wish to do so—and that is the memory of one who was the truest type of gentleman and whose character was as upright as his striking physical carriage.

J. G. H.

TELEPHONE DEVELOPMENT OF BRITISH TOWNS AT END OF 1928.

BY W. H. GUNSTON.

ON the 31st December last there were 1,759,686 telephones working in Great Britain and Northern Ireland, distributed as follows:—

Post Office system	1,723,307
Hull Corporation	15,700
States of Guernsey	4,226
States of Jersey	3,319
Railway and other private systems having connection with Post Office system ...	13,114
Total	1,759,666

This represents an increase of 125,864 telephones on last year's total—the largest increase yet recorded in this country. The population of Great Britain in 1926 is estimated at 45,500,000, which, if divided by the above-mentioned total, gives a ratio of 25.8 inhabitants per telephone (or 3.87 telephones per 100 of population). In 5 years the total number of telephones has increased from 1,148,095 to 1,759,666—an increase of 611,571 and the ratio of inhabitants to telephones has improved from 39 to 25.8. During this period the London telephone system has increased from 401,065 to 614,183, having added nearly 100,000 telephones to its total within the last 2 years. Since 1926 Manchester has increased from 50,254 telephones to 57,329, Liverpool from 48,349 to 53,308, Glasgow from 47,649 to 52,249, and Birmingham from 39,642 to 45,898.

The subjoined list shows the telephonic development of 50 cities or towns with not less than 20,000 inhabitants and 1,500 telephones. It will be seen that residential country towns and health resorts fairly share the honours with the large cities. The list includes all cities with 10,000 telephones and upwards, except Sheffield (17,129 telephones) and Belfast (14,102) each of which have an average of 29 inhabitants per telephone. The Hull telephone area (Corporation system) has 15,720 telephones, a ratio of about 20 inhabitants per telephone.

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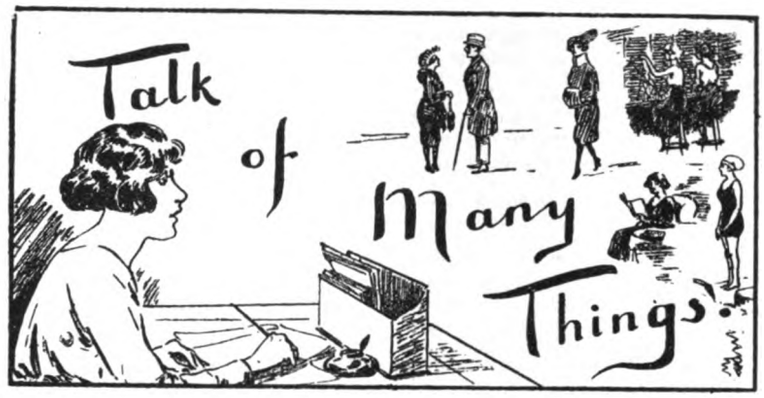
TELEPHONE DEVELOPMENT OF TOWNS WITH NOT LESS THAN 20,000 INHABITANTS AND 1,500 TELEPHONES.

		Population.	Number of telephones.	Inhabitants per telephone.
1.	LONDON Administrative County (*London Telephone Area, including the above and Croydon, Walthamstow, East and West Ham, Leyton, Willesden, Tottenham, &c.*	4,483,200 7,406,000	459,135 614,183	9.8 12.1)
2.	Guildford	24,987	2,322	10.8
3.	Harrogate	38,938	3,433	11.3
4.	Bexhill	20,363	1,579	12.9
5.	BOURNEMOUTH (including Poole and Christchurch) ...	142,422	10,790	13.2
6.	Eastbourne	62,030	4,592	13.5
7.	Southport	76,644	5,618	13.6
8.	Tunbridge Wells	35,568	2,551	13.9
9.	Chester	40,794	2,916	14.0
10.	St. Albans	25,588	1,676	15.3
11.	Torquay	39,342	2,552	15.4
12.	Woking	26,430	1,717	15.4
13.	Worthing	35,224	2,282	15.4
14.	CARDIFF (including Penarth)...	217,359	13,682	15.9
15.	Oxford	57,052	3,589	15.9
16.	BRIGHTON and Hove	188,946	11,567	16.3
17.	Blackpool	114,681	6,880	16.7
18.	EDINBURGH	420,281	25,187	16.7
19.	Cambridge	59,262	3,501	16.9
20.	Watford	45,910	2,623	17.5
21.	Folkestone (including Hythe, and Sandgate)	54,573	3,052	17.9
22.	MANCHESTER (including Salford, Eccles and Stretford) ...	1,055,473	57,329	18.4
23.	Bradford (including Shipley)...	314,268	16,854	18.6
24.	Aldershot	28,756	1,530	18.8
25.	LEICESTER (including Wigston)	242,780	12,254	19.8
26.	Southend-on-Sea	106,021	5,294	20.0
27.	Ayr	35,751	1,780	20.1
28.	Perth	33,208	1,625	20.4
29.	Bedford	40,247	1,958	20.6
30.	Warwick and Leamington ...	38,808	1,880	20.6
31.	LIVERPOOL (including Birkenhead, Bootle, and Wallasey)	1,115,939	53,308	20.9
32.	Cheltenham	48,444	2,322	20.9
33.	Huddersfield	110,120	5,232	21.0
34.	NOTTINGHAM (including Arnold and Carlton)...	292,969	13,829	21.2
35.	GLASGOW (including Clydebank, Rutherglen and Renfrew) ...	1,119,489	52,249	21.4
36.	Exeter	59,608	2,734	21.8
37.	Maidstone	37,448	1,710	21.9
38.	Reading	92,274	3,992	23.1
39.	BIRMINGHAM (including Smethwick, and W. Bromwich) ...	1,068,956	45,898	23.3
40.	Aberdeen	158,969	6,756	23.5
41.	BRISTOL (including Kingswood)	390,018	16,498	23.6
42.	Luton	57,077	2,796	24.1
43.	Hastings	66,496	2,723	24.4
44.	Preston	117,426	4,786	24.5
45.	LEEDS (including Morley) ...	482,265	19,279	25
46.	Shrewsbury	31,013	1,512	25
47.	Dundee	168,217	6,699	25.1
48.	Newport	92,369	3,638	25.4
49.	NEWCASTLE-ON-TYNE (including Gateshead, Gosforth and Wallsend)	458,201	17,295	26.5
50.	Stockport	123,315	4,660	26.5

Expressed in terms of telephones per 100 of population the larger cities show the following results :—

London Administrative County	10.2
(London Telephone Area	8.3)
Bournemouth	7.6
Cardiff	6.3
Brighton	6.1
Edinburgh	5.9
Manchester	5.4
Bradford	5.3
Leicester	5.0
Liverpool	4.8
Nottingham	4.7
Glasgow	4.6
Birmingham	4.3
Bristol	4.2
Leeds	4.0
Newcastle-on-Tyne	3.7

WE TELEPHONISTS



The Thrush and the Orchard.

WITH the greatest respect to the Editress, I must positively decline to say anything about Influenza either in general or in particular. Indeed, I feel rather ashamed of having had it. Hitherto I have weathered all epidemics and, after the fashion of man, I have been inclined to boast of my immunity. The man who lives to be 102 always has a list of excuses (he calls them reasons) for outliving the allotted span, and hitherto I have had a similar and equally incredible list, but of what avail are those reasons now ? To mention them would provoke derisive laughter. I should not feel so ashamed if, instead of Influenza—which everybody was having—I had had some more distinguished or unusual complaint, like gumboil or typist's eyebrow. But I didn't, so I am, and I won't talk about the 'flu.

The anticipation of the Editress may have been intelligent, but I feel that my anticipation was much more intelligent because I took to my bed just as the " Great Freeze " started. I felt a great deal of pity for those shivering, frost-bitten, chilblained mortals—many of them unwashed—who had to turn out of nice warm beds to go to business, and the more I snuggled under the eiderdown the sorrier I felt for them. As a matter of fact, the coincidence of my illness with the " freeze " made Camou rather suspicious, but after making me suck an unappetising thermometer (a barometer tastes no better, believe me) and getting a doctor's certificate, she relented—that is, if feeding me on " slops " can be called relenting. There is no doubt that an occasional illness makes us Edwards appreciate how comfortless and unlovely life would be without our Evangelines.

When the weather had " unfrozen " I decided to get better and I trotted out into the sunshine—after Camou had assured herself that I had adequate scarves and coats on my person and hot milk inside it, and had instructed me not to be " out too long." Bindle the hound led me on a familiar walk and we went through an old orchard. The ground slopes down from it to a winding brook and rises again through a narrow belt of trees to a ridge above. On the left is a copse—black and still in its winter sleep—replete with such scents as Bindle loves, and through it runs a charming little path. Over the whole scene as it presented itself to my eye, was a gentle mist touched by the sun with a glow of gold. The orchard is old and pathetic and it reminds me of an almshouse where the cronies nod and mumble of the past, boasting of original glory and deprecating present attainment. They are mossy, gnarled, and crooked ; some still are upright and others lean feebly and uncertainly. But perched above all and on a topmost branch was Robert the Thrush, bright with cheery chatter and with spring and sunshine and unfolding colours in his song. He explained that he was a bit out of practice but that he had felt that he must drop in for a chat while passing. He said it had been a hard winter, but people generally had been very decent with water and bits of bread, potato and fat, and in consequence he hadn't done too badly. He cocked his eye at me and hoped he might have the pleasure of snailing and worming with me in due course. " Delighted, I'm sure," I murmured.

And then Robert burst again into sweet music—music with delicate phrases, oft-repeated, with little trills of happy laughter, music reminiscent and prophetic. He told of green fields and leafing hedges, of snowdrops and sticky buds, of softer breezes and brighter skies, of gentle rain and fragrant earth and of the music of the air and the low hum of the insects. Even the cronies in the orchard were moved as if in response to old and sweet memories and their branches stirred feebly. Perhaps momentarily the sap had tingled in their veins. I stood and listened with bare head and uplifted face as his music flooded round and through me. Bindle was bored but tolerant and as Robert winged his way we wended down and across the brook home—to home where there was a bright fire and a brighter smile and tea and toast and cushions.

Peace be with the old orchard and blessed be Robert and all his kind. As to our Evangelines—ah, well, " discipline must be maintained " you know, as Mr. Bagnet says in " Bleak House."

PERCY FLAGE.

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Tom Hood (and the Weather) "up-to-date."

No sun, no moon,
No morn, no noon,
No dawn, no dusk, no proper time of day;
No sky, no earthly view,
No distance looking blue,
No road, no street, no "t'other side the way;"
No end to any "row,"
No indication where the crescents go;
No top to any steeple,
No recognition of familiar people,
No courtesies for showing 'em,
No knowing 'em!
No travelling at all, no locomotion,
No inkling of the way—no notion,
"No go"—by land or ocean—
No mail, no post,
No news from any foreign coast;
No park, no ring, no afternoon gentility;
No company, no nobility;
No warmth, no cheerfulness, no healthful ease,
No comfortable feel in any member,
No shade, no shine, no butterflies, no bees,
No fruits, no flowers, no leaves, no birds—
November?—No, March!

Telephone Version of Ye Floral Dance.

When the Auto System hove in sight—
Before the Manuals had taken flight—
Ev'ry Subscriber, far and nigh,
His brand new dial was taught to try
In our quaint old London Town.
Through to a Demonstration Set,
Each tone signal he had to get—
Finger-holes he was taught to ply
And code his numbers with careful eye,
For the Manuals were closing down!
So he had to handle a curious 'phone
And list for the sound of the dialling tone.

Mustn't say "Hello!" but be quite dumb,
And wait for the sound of a low-pitched hum—
Half-mesmerised, as in a trance
Each cut his capers in the Auto dance!

These demonstrations were most entrancing,
And the Subs. for transfer were still advancing—
City magnate and high-born dame,
Baker and banker—all the same,
In our quaint old London Town.

Upon each dial a finger was placed,
And twiddled around in trembling haste.
Whether they grasped it all I know not—
Whether they got a call they cared not—
But they followed the instructions laid down!
Then left alone with their curious 'phones,
They tried to distinguish the different tones—
Dialling, Ringing and Busy hum,
Or a wail like the whistle in a Rugby scrum—
And in their dreams at night, perchance,
They heard the music of the Auto dance!

I felt so lonely moping there,
Before a switchboard almost bare—
For there were but two or three
Of all my Subs now left to me,
In our quaint old London Town.
Then suddenly everything went "dis,"
And I thought to myself "Has it come to this?"
With my Subs. gone west life was blank indeed!
So I joined the rest in a wild stampede,
For our Manual was closing down!
Now I comfort the Subs. with the curious 'phones,
Who complain of the System with dismal groans!
I hear them bellow, in tones irate,
"I dial Sloane and get Bishopsgate"!
Strong men weep and others swear,
And dial "O" in wild despair—
They fume and frown, all round the Town
Alas! for the Auto's sporting chance!!!

C. A. S.

London Wall.

The annual treat to some of Islington's poor children took place on Saturday, Feb. 22, at the Medical Mission Hall, Britannia Row.

About 200 girls and boys were present and Miss Jessie Moore was, as usual, the "Commanding Officer." A willing band of helpers undertook the task of waiting upon the young visitors who, drawn from the Essex Road and neighbouring by-ways, were obviously deserving—and appreciative—of the good fare provided for their delectation.

Following a substantial meal, entertainment was provided in the form of "human marionettes," conjuring and ventriloquism. A distribution of parcels containing toys, games, books, sweets and cakes terminated a very happy function and the youngsters departed in pardonable disorder, each clutching a farewell gift of a bright new penny.

The members of the Nautilus Swimming Club held their annual Social for the distribution of prizes at the Anderton's Hotel on Jan. 28, 1929.

Mr. James kindly acted as Master of Ceremonies and was ably assisted by Mr. Sanders.

The large gathering had another opportunity of hearing the Misses C. Hunt and I. Morris, whose vocal solos are always much appreciated.

Miss Johnstone presented prizes to the following winners:—

Misses V. Long, N. Carpenter, M. Dominey, R. Dixon, L. E. Wilson, E. L. Kemp and E. K. Smith.

The Club cup became the property of Miss V. Long, who won it three years in succession.

A very enjoyable evening! May Miss F. Richards live long and organise many more.

G. M. T.

Holborn.

On Feb. 16 a merry afternoon was enjoyed by 200 children of the King's Cross Mission, when the staff of the Holborn Exchange gave their eighth annual Christmas tea. On arrival at the gaily decorated hall each kiddie received a paper hat, whilst beside each plate was a gay handkerchief (so useful for surplus cake!). Grace being duly sung the real fun started and buns and cake disappeared like magic. Cisterns may burst! but surely no roof was nearer rising than when the cheers of thanks went up from 200 happy youngsters.

Tea was followed by a conjuror, ably assisted by two small members of the audience, and "Joey" the clown caused much merriment. All good things must end, and with hands and pockets full with an orange, apple, a bag of sweets and a bright new penny, we said "Good-bye" till next year.

E. C.

Contributions to this column should be addressed: THE EDITRESS, "Talk of Many Things," *Telegraph and Telephone Journal*, Secretary's Office, G.P.O. (North), London, E.C.1.

LONDON TELEPHONE SERVICE NOTES.

Contract Branch.

THE business done by the Contract Branch during the month of February resulted in a net gain of 5,013 stations as compared with 6,263 stations last year.

During the extremely cold weather in February, Contract Officers working in residential areas found frequent difficulty in obtaining interviews. When they rang the bell of a house someone would eye them through a window and then presumably return to a fire, and any amount of ringing on the front door bell would not induce them to come and talk to the man outside. This probably accounts to some extent for the reduced net gain, and it may be desirable to consider now, in readiness for the next severe frost, the possibility of making our Contract Officers look like plumbers!!! They would then be welcomed with open arms and the anger of the duped might be turned away with the offer of a telephone to enable all shopping and errands to be done from the fireside!!!

There were 1,184 exhibitors at the British Industries Fair at the White City this year, and orders were taken for 379 exchange lines and 49 call offices, as compared with 311 lines and 28 call offices last year.

My attention has just been drawn to the following notice on a local tradesman's price list:—

"My telephone was installed for the express purpose of being of benefit to my customers.
During inclement weather the telephone is a tremendous advantage.
Please do not fail to make the greatest use of same.
TELEPHONE: XXXX 1390."

This is a step in the right direction.

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It is good at times to know what other people think of us but what are we to think when subscribers' opinions of us are as far apart as the following two letters indicate :—

Dear Sir,—The telephone is as bad as ever, thanks to a rotten operator, but I want my top extension moved down to next storey.

Do I understand that a private house cannot have a wall bracket 'phone. I think I did when I put extension in ground floor front—which, if so, of course, convinces me of the loathsome type that creeps into government offices—men and women who ought to be shot or drowned in batches of 100 or so until the breed is exterminated—What a happy England it might then be—I can assure you the thought of the "Civil"!!? *Servant*?? mentality fills me with contempt and loathing that men can become so base and contemptible. Women, of course, are past praying for; vulgar irreligious wantons.

As usual, I remain your angry mistress,

.....

Dear Sir,—In the first place I should like to express to the London Telephone Service my thanks for the trouble they have taken about my telephone during the past few years: the numerous stops they have put on in order to ascertain the cause of so many wrong numbers. The chief difficulty was in being called up at all times for 7568. I am inclined to think that the fault lay with the subscribers who used this number; they evidently slurred over the second digit, thereby causing aggravating mistakes. . . .

I should like to take this opportunity of expressing my thanks to the Post Office and to add that it gives me great pleasure at all times to speak and write of the efficiency of the London Telephone Service, which I find better than any telephone I have used in various parts of the world.

Yours faithfully,

.....

A subscriber on being informed that an internal removal could be carried out, replied: "I did not know that the London Telephone Service had a surgical department."

* * * *

The London Telephonists' Society.

On Friday, Mar. 1, the London Telephonists' Society held the fifth general meeting of the session at the City of London Y.M.C.A., Aldersgate Street, E.C.4.

There were a large number of members present, and tea, which was served in the ante-room prior to the meeting, made the opportunity for that social intercourse which has been so prominent a feature of the season.

At 6.30 p.m. the Chair was taken by the President, Mr. Horace Dive.

The programme for the evening included the reading, by the successful competitors, of the prize-winning papers of the year, as follows:—

Class A.—Telephonists.

"Pity the Poor Automatic Telephonist."—Miss B. McDonald, H.Q. Obs. Office.

"The Fall of the Empire (Leicester Square)."—Miss G. Latimer, Temple Bar Exchange.

Class C.—All Other Grades.

"Something to Look Back upon."—Mr. J. Shepherd, Tandem Exchange.

It can be imagined from the titles that the matter contained in these papers was varied, but it need scarcely be said that, as prize-winning papers, they were uniformly good. They were read by their respective authors with such charm and force as to render them of the greatest pleasure to the audience.

A short story, written by Miss M. Carter, of Sydenham Exchange, was then read. This story was called "Treason in the Service," and the suggestion of such an improbable condition aroused the audience to a state of thrilled expectancy. Nor were they disappointed, and Miss Carter's ingenuity was rewarded with laughter and applause.

A prize was awarded to Miss C. Lear, of Mayfair Exchange, for the following limerick, "When in your house a burglar you meet, A 'phone in the house is worth two in the street." Miss A. G. Turner, also of Mayfair Exchange, won the prize offered to the telephonists who entered into the debates following the meetings.

It has always been the privilege of the Society to retain the interest of the Controller, and his presence at the meeting was very greatly appreciated.

Mr. Valentine very kindly presented the prizes, and he spoke gratifyingly of the interest which he observed was sustained in the affairs of the Society by all its members. He also said how especially pleased he was to notice that the more senior members never lost touch with the proceedings.

In conclusion, Mr. Dive passed a vote of thanks to the Controller, which was carried with acclamation.

Football.

The arrangement of fixtures left the L.T.S. team without a league game for practically a month, and after the splendid victories over the two leading clubs in February, it was feared that the team would not be as effective on the resumption of league football on Saturday, Mar. 9, when a visit was paid to Acton to play the return game with the Ministry of Health.

The long rest, however, seemed to have benefited the forwards in particular, and in a heavy scoring game we succeeded in winning by 6 goals to 3. The forwards played excellent football and Gordon, in addition to scoring two goals, led many attacks with much of his old-time skill. Bishop and Jeffery divided the other goals. The team seem certain to finish in a high position in the league, but it is probably now too late to expect them to annex the championship.

* * * *

Cricket (Contracts).

Arrangements are well in hand for the forthcoming Cricket season and Mr. "Tim" Cowdrey has been selected to captain the team. The league competition promises to be even more interesting this year by the inclusion of the "Messengers."

Instead of only three teams there will now be four, requiring 6 matches to be played by each team.

* * * *

Bowls.

Considerable progress has been made with the programme for the forthcoming season at Chiswick. There will be 15 Service teams competing in the league tournament divided into two sections A and B. The London Telephone Service team will compete in the A section, and the proposal is to reshuffle the teams in the following season on the basis of the positions occupied at the end this year of the clubs in the respective sections.

The intention is to develop some system of promotion and relegation and thus make the competition more interesting.

The Civil Service Championships will be held at Chiswick this year and the Committee have decided to enter a team in the "rink" competition. Individual members can, of course, compete in the "Championships," and the committee hope that the London Telephone Service will be well represented.

* * * *

Table Tennis.

The open competition which has been running during the winter months was concluded on Mar. 6, when the men's semi-finals and final were played.

Mr. J. Cameron, of the Accounts Branch, was the winner after a hard tussle with Mr. G. Lewis.

The ladies' competition finished a week earlier, and Miss P. Gardiner beat Miss J. Slaney, both of the Accounts Branch. Prizes were awarded to the winners and finalists in both sections. The President of the club, Mr. W. R. Bold, on each occasion made the presentation of prizes given by the L.T.S. Sports Association.

The competition proved very popular. Ninety-five entries were received (55 ladies and 40 gentlemen).

The games were played on portable tables in one of the Accounting Rooms and the conditions altogether were quite good.

Entries were received from each of the Branches of the L.T.S., including several from the exchanges. The T.T. Club will arrange a further competition next season, when it is hoped a still greater number of competitors outside the club, particularly from the exchange staff, will enter. Mr. Hough, the secretary, deserves the warmest thanks for the capable manner in which the competition was organised, and the attendance of the President, Mr. Bold, at so many of the matches was much appreciated.

* * * *

Netball Competition.

Matches in the second round of the competition for the "Liddiard Shield" resulted as follows:—

Controllers' Office (1st team), w.o. Rodney (scr.).
Controllers' Office (2nd team) 13, Holborn (2nd team) 6.
Central 24, Thornton Heath 6.
Clerkenwell 12, Holborn (1st team) 8.

Semi-finals.

Controllers' Office, 1st team 36, 2nd team 10.
Central 15, Clerkenwell 12.

The final tie between Central Exchange and the Controller's Office 1st team will be played on the Civil Service Sports Ground at Chiswick on May 4, when it is hoped the donor of the Shield, Miss J. Liddiard, will be present to hand the trophy and medals to the winners. In addition, a five-a-side knockout tournament will be held. Particulars can be obtained from Miss E. L. Sanders, Controller's Office.

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THE

Telegraph and Telephone Journal.

VOL. XV. MAY, 1929. No. 170.

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TELEGRAPH AND TELEPHONE MEN AND WOMEN.

LXIV.

MR. FRANK ERNEST MARKIN.

THE subject of our portrait, Frank Ernest Markin, needs no introduction to telegraph men and women in Great Britain.

Born at Melton, Suffolk, in 1869, Mr. Markin left his native heath in 1888 for the less salubrious but more invigorating atmosphere of Manchester. There, by his native ability and sound judgment he passed through the various grades, becoming Chief Superintendent, Telegraphs, in 1926, and by his great personal charm endeared himself to all those with whom he came into contact.

A shy and retiring man with no love for the limelight, he nevertheless became an influential member of the executive of the old Postal Telegraph Clerks' Association, and in that capacity brilliantly represented telegraphists before the Bradford and Hobhouse Parliamentary Committees.

Mr. Markin retired from the Service in April. His departure will be regretted by a large circle of friends and colleagues. We wish him long life and happiness in his well-earned leisure.

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HOW TO IMPROVE THE TELEGRAPH SERVICE.

IV.—BY A REPRESENTATIVE OF THE IMPERIAL CABLE AND WIRELESS SERVICES.

[NOTE.—*The Editing Committee accepts no responsibility for the views expressed in this series of articles.*]

THE telegraph was born of man's desire to establish speedy communication with his fellow men. If it fails in that respect, and falls so far behind other forms of communication as to become comparatively slow, the necessity and desire to use it will decrease, and ultimately disappear.

Speed is a comparative thing. When the telegraph was established man progressed over the earth's surface and the face of the water very slowly, when judged by modern standards. His journeyings were also uncertain. Until the end of last century, the speediest form of transport was the railroad, but the advent and swift development of the internal combustion engine has resulted in almost revolutionary changes in travel, particularly in those countries with highly developed road systems, and, although travel by rail is faster than ever before, traffic is declining. The diminution in the number of passengers carried by the railways is a serious matter to the companies, but a source of joy and revenue to the omnibus proprietors. Both parties are conscious that travel is increasing: the problem is to assign to each system the class of traffic which it is best equipped to deal with.

HOME TO HOME AND POINT TO POINT.

Railway passengers must of necessity be deposited at some more or less central point (a station) from which they find their own transport home: the 'buses very largely provide a door-to-door service. On short or medium distance journeys the latter system unquestionably scores: on long journeys its success is problematical.

Consider the telegraph and telephone services on the same basis, and the rapid growth of local and short-distance telephoning and the concomitant decrease in revenue and traffic to the telegraphs is explained. It also suggests why long-distance communication is still largely in the hands of the senior service. The telegraph is a point-to-point service, the telephone a home-to-home one. Pursuing the analogy, the similarity extends to the problem of acceptance, except this, that while the railways have, until recently, made little or no attempt to "road feed" their trains, the Post Office, in a moderately successful, but continually growing way, has fed the telegraphs through the phonograms.

Unfortunately the analogy ends here, for, while the railways, by securing a return of the lost traffic, could once more show a profit on their capital, the telegraphs, even if the "good old days of morse working and the sixpenny telegram" were to return, could not, unless—

PRIZES OFFERED.

To the individual who can complete that sentence a glittering prize will deservedly be awarded. In fact several such prizes, for he will surely deserve well of the nation, of the staff, and of the business man. Not that the last mentioned ever gives much away at any time: in fact the main problem of the telegraphs appears to arise from his desire to take largely without giving adequately in return. For all I know the policy of the Government may be to keep rates as they are, but any increases would certainly be opposed by the commercial community as a whole. What, then, should we do?

DECLARE A POLICY.

It costs approximately 1*s.* 4*d.* to accept, transmit, and deliver a shilling telegram, from which fact it will be apparent that unless we are to adopt the system of the Irishman who sold all his goods at a loss but lived on the turnover, an increase in traffic will not solve our financial troubles.

Which fact prompts me to ask for a clear declaration of telegraph policy by some responsible Minister of the Crown. The sixpenny telegram did not pay. The shilling telegram does not pay. There is no indication of a further increase. Obviously, either operating costs must be reduced (these work out at 1*s.* 1½*d.* per message) either by lowering wages (groans from everybody, including the writer), or a system devised under which a greater and more constant output per man may be obtained. Lower wages in not a few industries have been enforced with, in general, disastrous results, and without assisting the firms directly concerned to a marked degree, while the question of output embraces more than the staff: apparatus also is involved.

No, what is wanted is a clear declaration on the question of whether the telegraphs must be made to pay. If the service has to show a profit on its working, and to be run on accepted business lines (we know what that will mean), the sooner we are told so the better: but we must also be given a free hand to work out our own salvation as a department. If the policy is to make the telegraphs a national service, thoroughly efficient, of wide ramifications, and of real use to every citizen of this country and to other nations, then we also ought to be told. Of course, the latter policy involves finance, and it is granted that a limit of expenditure, or subsidy, must be reached, but that limit could vary (again within limits) according to the needs of the country and the development of the service. I cannot speak for anyone but myself on the point, but I should imagine that the absence of a declared policy on this matter has had, still has, and always will have a most unsettling influence on the whole telegraph staff which sees movements, staff alterations, new methods, new standards, &c. being experimented with and enforced without their having any definite idea of the policy behind them. The nightmare deficit on the service ought to have been faced long ago. I do not say that it has not created concern in the proper administrative quarters, but mere anxiety never cured sickness. The diagnosis shows the patient to be suffering from financial malnutrition: what is the cure? The first step in the cure of disease is to recognise the cause of the trouble, and the sooner it is recognised (publicly, in this case) the sooner will it be possible to commence the cure.

SOME QUESTIONS.

If the policy of the Government is that the telegraphs are an essential part of the life of the nation, that they should be made to pay if possible, but that if they cannot (under existing tariffs) they must still function efficiently, then one may be pardoned for asking why they are not as efficient as the members of business organisations demand? Why transmission times are increasing between long-distance stations? Why delay has even been recognised? Why, in other words, the service has been permitted to slow down, and its usefulness thereby decrease?

If, on the other hand, the telegraphs must be made to show a profit on the invested capital, the questioning is resumed by asking why the Press of the country is still subsidised through the telegraphs? (I recognise the dangers to small provincial papers which would follow the raising of the Press rates. The big syndicates could pay where the small independent firms could not.) Why, if there are good reasons for continuing the Press (and advertising) subsidy, the Treasury does not establish a principle by making a grant to the department to cover the loss on these particular telegrams, and on other unremunerative traffic? Why at least one thousand telegraph offices are maintained in almost non-traffic areas? And there are many other philanthropic actions, both to the public and other departments, which might form the subject of questions.

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EXACTING FELLOWS.

The keenest critic of the Post Office is that vaguely indefinable person, the business man. As a class he worships only one thing, success, which too often only means profit. The telegraphs are therefore not a success, except when they provide him with everything he wants irrespective of cost. But only while he is a business man: when he becomes taxpayer, he speaks with a different voice. Personally, I have formed the opinion that the nation is not unduly disturbed over the loss on the telegraphs: the Post Office as a whole shows a profit of many millions per annum, and, for reasons which will be apparent to students of business principles, I would strongly support any proposal to lump all Post Office accounts into one. That would not mean that we could then lie back and be content with the telegraphs as they are. The telegraphs must be made as efficient as scientific skill and business methods can make them: apart from the question of profit they must be a real public service, their speed must be raised as near to the theoretical maximum as possible, and the staffs must be kept fully conversant with departmental policy in order that they may work in with new schemes intelligently.

SOME SUGGESTIONS.

1. The telegraphs are likely to become long-distance links, and the telephones largely short and medium-distance ones. The necessity for unified control of the two is apparent. The two departments should be amalgamated.

2. The provision of apparatus at all main offices which will carry telegrams at high speed, and with great accuracy and truthfulness is imperative. According to responsible controlling officers, the Baudot fails in stability, and as a result of these failures the confidence of the operating staff is impaired. Apparatus faults are distressingly frequent. That the Baudot should work is good in theory: that it does not work well enough is supported by practice. All staff, engineering and otherwise, engaged in instrument-room work should be under the control of the Postmaster and be responsible to him.

3. The too close positioning of instruments at concentrator switches is responsible for the loss of many staff hours due to the difficulty of hearing the weak sounders properly. The difficulties of space are serious at the larger offices, but anything which tends to hinder output is also serious.

4. A greater degree of local autonomy in points like that mentioned in the preceding paragraph is desirable.

5. We require much more specialisation in the telegraphs. Writing duties have been specialised to some extent, but operating duties handling live traffic are not less important. The question of specialisation affects the promotion question, and for that reason and because it would divide the staff into smaller groups, it would perhaps be necessary to

6. Abolish the present Overseer class and substitute a Chief Clerk class for each specialised section.

7. The acceptance and transmission of telegrams should have priority over all other Post Office business at offices where no specialised accepting point exists. Telegrams should not be delayed while parcels and other comparatively non-urgent business is transacted.

8. The phonograms should be staffed by telegraphists and the staff and the circuits should be under the control of the telegraph chief. (This proposal is subject to unification of control not being immediately practicable.)

9. Delivery rooms in large cities should be under the direct control of an officer with the telegraph sense. Postmen cannot be expected to acquire that desirable thing late in life.

10. A Travel Telegram should be introduced, in order to encourage all travellers to use the service. Travel telegrams should be sold in books of twelve specially stamped forms for ten shillings, and the texts of the messages must relate to travelling. These messages would bear a special indicator, which would be counted as one word: the discount for cash would therefore only be one shilling in twelve telegrams. Advertising space in the books could be let to hotels, banks, shipping agents and railway companies &c.

11. Christmas telegrams should be extended to the Inland service at 6*d*. each, the text being standardised in one form only.

12. The fee for registered addresses should be raised by one pound, and all such registrations should fall due on one date, preferably a winter month.

13. The Night Letter service should be extended to include towns which can be reached by post from the main receiving office.

14. Repetitions of doubtful words should be accepted over the telephone the addressee being required to repeat the preamble. The whole of the fee should be refunded if one error is disclosed.

15. Receipts should be free. All that the receipt form need contain is the serial number of the message and an impression of the dated stamp.

16. All staff engaged in instrument rooms should be entitled to a ten-minutes' relief during the first and second portions of a continuous duty of eight hours.

17. Telegrams addressed to houses which are found closed, and at which no letter-box is provided should not be sent out on second and third occasions, without a fee being collected for extra services rendered. Alternatively, the telegrams should be posted.

18. Telegrams addressed to offices at which no regular messenger staff is employed should be charged sixpence extra to cover part of the additional cost of delivery.

19. Telegrams insufficiently addressed (this is frequently done to save a penny or two) should be advised at once, but the fee for amended addresses in the same town should be reduced to sixpence.

20. An officer highly trained in internal wiring and mechanics of complicated telegraph apparatus should be appointed at each large town. His sole duty would be to supervise plant, and he would be responsible for its efficiency. The present technical officers are not sufficiently qualified to act as plant superintendents.

21. The delay on telegrams from London is (so far as my own office is concerned) much heavier than the delay to London. This ought not to be.

22. The capital charged against the telegraphs should be written off.

23. An officer of supervising rank should be appointed at each large centre to represent the telegraphs in all its dealings with the public. He should be properly trained for this work at headquarters and should visit all complaining firms and individuals personally. His area should be a large one in order to secure a more or less standard policy and have the Department speak with but one voice.

[The next article in the series, by an Engineer, will appear in the June issue.]

NORTH MIDLAND DISTRICT TELEPHONES: PRESENTATION TO MR. F. O. WATSON.

ON Feb. 7 Mr. F. O. Watson, Assistant Traffic Superintendent, was presented with a mahogany china cabinet and silver-plated hot-water jug to mark the occasion of his forthcoming marriage. Mr. C. N. Carter, Traffic Superintendent, in asking Mr. Watson to accept the gifts, spoke of the regard in which the recipient is held among his colleagues, while other members of the Traffic Staff wished Mr. Watson and his bride-to-be every happiness. Mr. Watson, in his reply, expressed thanks for and appreciation of the gifts and good wishes.

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INTERNATIONAL TELEPHONY.

BY H. TOWNSHEND.

(*Continued from page* 129).

I SHOULD remark here, incidentally, that the system so far universally adopted in Europe, and embodied in the International Telegraph Regulations, of dividing the rates *on each international call* between all the terminal and transit Administrations concerned in handling it, is not the only way in which the latter might be remunerated for their services in providing connexions for the terminal countries. I personally think that, while the present system has great advantages in an early stage of development of long international lines, the time may come when some, at least, of the transit countries may prefer to lease their lines to the terminal countries using them in return for adequate fixed rentals, thus leaving the latter free to fix their own charges, and accessory services, in accordance with the economic conditions and with the particular demands of their own public.

The effect of these complications, combined with the somewhat dangerous attractions of rate standardisation, and a historical over-emphasis in Europe on cost-accounting as a factor in rate fixing have, in my view, only just failed to have unfortunate results.

Examples of Rating Questions.—Ineffective Calls.

Thus, for example, at the Paris Telegraph Conference of 1925, the view was urged, and very nearly adopted, that since the failure of a subscriber or his employees to reply when his bell rings for an international call may in certain circumstances involve the Administrations in a loss of valuable line-time, such calls, though wholly ineffective and useless to the caller, should be charged up to him, as though he had really had 3 minutes' conversation. I think it is not too much to say that, had this proposal gone through, the subsequent rapid growth of international telephony in Europe might have been sharply checked. In the first place, comparatively few subscribers would risk their money on the chance of a bell being answered in a foreign town hundreds of miles away; in the second place, the Administrations being paid equally for effective and ineffective calls, would not have before them a standing realisation (from their statistics) of the necessity of striving to keep down the number of ineffective calls; and, in the third place, the service would have been saddled with constant friction (arising out of disputes about what happened in particular cases) between the Administrations and their subscribers. As it was, the Conference wisely left the point undecided (covering it by one of the permissive or optional regulations to which I have referred), and it is significant that, only two years later, the Advisory Committee recommended that no charge should be made in cases of "No Reply" from the called subscriber's telephone. If the Paris Conference had accorded a similar optional recognition to the personal call as well as to the préavis, to which I have alluded, I think it is possible that a similar result would by now have followed.

The Uniform Rate-Scale.

Again, three or four years ago, it was felt that a number of countries which were being brought, for the first time, into the European international telephone network, wanted some guidance as to the rates which they should charge at the outset on their international calls. The C.C.I. accordingly charged a Committee of Rapporteurs with the duty of examining confidential statistics furnished by a few of the more experienced Administrations relating to costs on a limited number of modern circuits, and asked the Rapporteurs to produce some general advice on the subject. Events showed that, at that stage of development, there was a strong feeling in favour of the Advisory Committee recommending all the Administrations to adopt a uniform rate-scale (of so much in gold standard currency per 100 km. plus a fixed operating charge for the terminal countries), to be applied to calculate automatically each country's share of the rate on a 3-minute call anywhere in Europe, regardless of local costs and of variations in demand. (In passing, I have seen this rate-scale referred to as though, if it had been adopted, it would have resulted in a uniform scale of rates based on crow-fly distance being charged to the public for calls between any two European towns. This is of course not even approximately the case. On the contrary, it would have resulted in many cases in there being two different charges to the public for calls between the same places—e.g., between London and Berlin via Holland or via Belgium—according as the call was routed in one way or another, though the routing of a telephone call does not, of course, concern the subscribers in the least.) After prolonged discussion, however, the Rapporteurs confined themselves to a declaration that the suggested standard scale of charges should suffice to cover the costs in favourable conditions in a number of relations (i.e., between a number of countries), and added that, in view of the difference of local circumstances, they could not recommend a uniform scale of rates. In spite of this caution, a number of countries—not, of course, all—adopted the rate-scale on all their international services; and I personally fear that it is already beginning to land some countries of high cost into difficulties. If this is so, one would expect these countries to find that, when their existing new large-capacity cables become exhausted, the returns from their traffic will not suffice to finance, or to justify financing, new ones, so that, either the speed of service will have to be allowed to suffer—a retrograde step which every Administration would be most reluctant to take, or the rates in these countries will have to be raised—always an awkward proposition for any public utility to tackle.

"Urgent" Rates.

This difficult question of international rating has been still further confused by a difference of opinion on a question to which I have already referred—namely, the propriety of admitting what are known as "Urgent Calls," that is, calls accepted at double or treble the ordinary rate, on condition that if there is congestion on the international line, they are to receive priority over all the ordinary calls on hand. There are two views on this, one held practically throughout the Continent of Europe; the other held in England, Spain, and America; and I do not think I can do better than quote Dr. Feyerabend and Mr. Gill as representing authorities taking these two views respectively. First of all, the European view. I am quoting Dr. Feyerabend's book, cited above:—

"In striving after the highest possible use of the Trunk lines two contrary conditions operate: the unequal incidence of the traffic and the unavoidable loss of paid time because it is practically impossible to range the calls immediately one after the other . . . The Administration is compelled to calculate the number of lines so liberally that the calls can be put through even in the hours in which the traffic is heavy without too long a period of waiting. Whilst the pressure of calls in the busy period can hardly be avoided, the loss of paid time arising from official signals, the calling of subscribers, and slack operating, can be lessened by special measures . . .

"In spite of the measures for speeding up, the fact remains that if one does not increase the plant *beyond an economically tolerable measure*"—[the italics are mine]—"the trunk traffic reaches daily a high peak at which the calls are crowded together and during which long periods of waiting are unavoidable. The desire to make calls in specially important cases with priority over other orders was, therefore, early expressed by subscribers. Accordingly, the Telegraph Administration, supported by the institution of urgent telegrams since 1888, has admitted Urgent calls which are effected at a threefold charge with preference over ordinary calls. They always strove to keep the number of preferential calls as low as possible, and for this purpose so to provide plant that ordinary calls could be dealt with even in busy periods without too great delay. Before the war the urgent calls did not exceed more than 5 to 6% of the total trunk calls, a figure which, having regard to the reasonably low trunk charges of that time, could be considered as tolerable. During the period of money depreciation the urgent calls increased in consequence of the unusually heavily increased traffic, for which the relief routes (Absatzwege) did not by any means suffice, and in consequence of the much too low charges lagging behind the money depreciation, even the urgent calls had to wait hours long to mature. As the most important trunks were fully loaded with urgent calls, a further priority had to be created. This occurred in 1923 with the introduction of 'lightning' calls, first with a hundred-fold increase, since 1924 with thirty-fold and since 1927 with ten-fold charges. In the years 1923 and 1924 the number of lighting calls and the receipts from them had a certain importance—now they are an exceptional occurrence. The urgent calls, too, in the inland German service since the stabilisation of currency and when a considerable increase of relief lines was available by the extension of the main cable system, declined in the year 1926 to the moderate position of 3%. The year 1927 will bring a further decline in the figures." (This passage, of course, relates to the German internal service, but I think it illustrates sufficiently the principles governing the "urgent call" system wherever it is adopted.)

Mr. Gill, in the paper which I have already cited, summarises the position as follows:—

"There are two entirely different foundations for the" (long-distance) "rates in force in Europe . . . and the two may be stated in condensed form, thus:—

"(*a*) Service at as cheap a rate as possible, this rate being termed 'Ordinary.' Ordinary calls should experience a delay of not more than 30, 60 or 90 minutes, according to the length of the circuit. Calls may be ordered to be 'Urgent' at triple the ordinary rates, or to be very fast ('Lightning') at 10 times the ordinary rate. Equipment is not intended to be provided to meet busy hour loads but has to be provided on the basis of the loads spread out by reason of the delays permitted.

"(*b*) All calls are of equal urgency and pay the same rate, called here the 'Day' rates. A faster service with the delay not exceeding, say, 10 minutes, is aimed at. Equipment is provided to meet the busy-hour load.

"As will be expected, plan (*a*) leads to more calls per line per day, longer delays and a cheaper ordinary rate.

"Plan (*b*) leads to fewer calls per line per day, a faster service and a 'Day' rate which is dearer than the ordinary rate under Plan (*a*)."

Mr. Gill sums up in favour of plan (*b*) on two main grounds:—

First, that if there is any appreciable proportion of calls paid for at the triple "Urgent" rate, the *average* rate paid by a subscriber is inflated by his having to order the calls he wants to get through quickly as "Urgent"; so that the advantages of the cheap ordinary rates are, *pro tanto*, illusory.

Secondly, the "Urgent" rate system renders the financial conditions on any particular route unstable, and puts a premium on inefficiency—that

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is to say, that any route on which "urgent" calls are admitted becomes more and more profitable to the Administrations in proportion as they fail to provide sufficient plant to give a decent speed of service, because the consequent congestion of the traffic automatically increases the proportion of calls which the subscribers have to order and pay for as "Urgent" in order to get them through within a reasonable time. Moreover, the financial difficulties of an Administration struggling to provide a good service may be aggravated by the fact that, if it lays a new cable to relieve a congested route, as soon as the new cable is put into service, even if additional traffic is attracted by the faster service given, so that more calls are made, the total receipts may fall off heavily because the number of "Urgent" calls will suddenly decline.

I venture to think that the fundamental difference between the two systems tends to be rather exaggerated and is—at least in its most important aspect, i.e., in regard to speed of service—a matter more of theory than of practice. At all events, counsel has certainly been darkened by misunderstandings on both sides. In the first place, the figures of 30, 60 or 90 minutes delay mentioned by Mr. Gill, which were given advisory sanction by the C.C.I. two or three years ago, were intended only as absolute maxima; and, in fact, are now quite out of date, since nearly all the Administrations now provide a much better standard of service than this. In the second place, statistics of delay on the European international routes, which are published annually by the C.C.I., relate only to the busy hour; in spite of which I have seen them compared with figures of delay on American routes which are calculated over the whole day period, including the afternoon when, generally speaking, a much more rapid service is given—at all events in Europe. On the other hand, advocates of "Urgent" rates have very much exaggerated the point that the American system necessitates charging more for ordinary calls, because in comparing American and European rates reduced to a common gold currency, they have frequently failed to make any allowance for the fact that the purchasing power of gold in America is, generally speaking, substantially lower than in Europe. Moreover, if the proportion of "urgent" calls, even at triple rates (and some countries only charge double the ordinary rate), is to be, as Dr. Feyerabend contemplates for Germany, less than 3%, the additional receipts they bring in must be less than 6%, which does not seem to allow much scope for lowering the "ordinary" rate. It is certainly the case, speaking generally, that long-distance telephone service in America is both quicker and dearer than in Europe; it may do us in Europe no harm to exaggerate the American point of superiority, but I do not think it is good for us to overestimate our advantages in the matter of cheapness.

The whole question is much too difficult for me to venture to arrive at any conclusion; but I will state one significant fact. In the Anglo-Continental telephone services, there are no "urgent" rates but, on the other hand, a service without any delay in the busy hour is not regarded as economically practicable. A fairly rapid service is, however, given. For example, the busy-hour delay on calls from London to Paris is not more than 10-15 minutes and on calls from London to Berlin not more than 30-40 minutes. (Of course, in the afternoon hours and in the evening a much more rapid service is given.) Now on most of the Anglo-Continental routes rather more than half the calls are in the inward direction; i.e., are booked and paid for by Continental subscribers. This seems to me to be convincing evidence that a rapid "ordinary" service is financially practicable on the Continent of Europe as well as in England and America. I do not wish to suggest, however, that this is decisive on the vexed question of "urgent" rates.

Statistics.

A propos of statistical comparisons, I should like to mention one point about statistics generally. Statistics, although I have refrained from inflicting any on you in this paper, are, of course, absolutely fundamental in the administration of any telephone service, national or international. It is not too much to say that every decision taken by a telephone authority should be, not only defensible by means of, but based on reliable statistical evidence. I hope this is the case with the opinions I have expressed in this paper. It is, of course, impossible to deal here at all with telephone statistics, which is a subject in itself and of a very technical nature; but I think it is relevant to the general problem of international telephone administration that we in Europe have—in my belief—much to learn in the matter of statistics from America.

So far, I have dealt only with international telephony in Europe because, speaking generally, the first quarter of the 20th century has been the era in which telephonic communication between the industrial centres of population in the different European countries was established, organised and put on a firm basis. Much still remains to be done; and the next few years will certainly see substantial developments in the geographical scope of European international telephony, as well as a further marked improvement in the existing services, especially as regards the speed with which callers can get into oral touch with their foreign correspondents, and in general efficiency in matters of detail requiring standardisation. The ground-plan of a complete inter-European telephone system has, however, been laid and for some time to come progress, so far as I can see, is likely to be on existing lines and within the framework of the existing organisation.

Inter-Continental Telephony.

Two years ago, however, an event occurred which the Press described as "epoch-making" in the history of communications—in January, 1927, a public telephone service was first opened between the Old and the New Worlds. This beyond doubt marks the beginning of a new telephone era, the era of *inter-Continental* telephony. Since it was not at that time technically possible to construct and lay a transatlantic submarine cable capable of transmitting speech, it was necessary to resort to radio to form a link between the European and American telephone cable-networks. Four wireless stations were required (more are now in use), one each for transmission and reception on each side of the Atlantic; but for operating purposes these form only one transatlantic "route" terminating in the New York and London Trunk Exchanges, and up to date all calls between the two Continents are handled in those two exchanges. The very great difficulty of separating the free æther waves carrying the voices of the two speakers was surmounted after prolonged experiments by the device of very delicate voice-operated relays, by means of which the voices of the subscribers on each side of the Atlantic, as they are speaking, alternately switch the radio circuit into operation first in one direction and then in the other. The radio apparatus employed to provide the first circuit was long-wave and non-directional; the second circuit is short-wave and directional.

From the administrative point of view, the transatlantic service presented some exceptional features. First, only one circuit, capable of carrying a quite limited number of conversations a day, could at that time be provided; until technical developments made it possible to bring into use a second circuit the maximum amount of traffic between the two Continents which could be carried was, therefore, strictly limited. Secondly, the cost of providing and maintaining this one circuit was very high. Obviously, therefore, the rates charged at the outset had to be high. Thirdly, the circuit, though normally very efficient, was, like all radio circuits in the existing state of the science, liable to periodical disturbances or even complete interruptions, due to what broadcast receivers know as "atmospherics." This made it necessary, before a public service could be opened, to set up machinery for aiding the caller who was unlucky enough to strike a period of atmospherics in every possible way to get his call through—if not at the time, a little later when conditions improved—and also for making a rebate of part of the charge in cases where the call, though successful, was unduly prolonged owing to repetitions necessitated by transmission difficulty. The policy agreed upon by the American Telephone and Telegraph Company and the British Post Office and successfully followed is, while keeping a carefully detailed record of such difficulties (both for scientific purposes and as a check on the rebates allowed) to treat the public liberally.

The service was at first limited to the cities of London and New York and was only open for a few hours daily. Within a few weeks it was extended stage by stage until it covered the whole of Great Britain and the United States; and at the same time the daily hours of service were increased. Within a few months it became possible further to extend the transatlantic service to some of the capital cities of Europe and then to the other principal cities in the Continental countries having a good telephone network and connexion with London. These extensions are still going on, but a position has now been very nearly reached in which there is complete intercommunication between the European international telephone system, the organisation of which I have described, and the North American telephone network covering the whole of the United States and Eastern Canada and the chief towns in Western Canada, Cuba and Mexico; this intercommunication is wholly effected over the London-New York radio link. About a year after the service was opened, the possibility of bringing into service a second radio circuit came into sight and it was possible to lower the rates. There are now two London-New York circuits and others are being arranged for. In spite, however, of the fairly complete geographical scope of the service, it must, of course, be regarded as still in its infancy; obviously to meet the economic conditions quite a large number of circuits will ultimately be required. From the administrative point of view, therefore, inter-Continental telephony is still in the early engineering stage and the administrative problems which will be involved in handling large volumes of traffic have not yet arisen.

Future Organisation of Inter-Continental Telephony.

The day-to-day conduct of the inter-Continental service already presents, however, some problems of organisation which have been met by a working compromise adequate to the present stage of development. The American Telephone and Telegraph Company, which maintains a permanent technical representative in Europe, with an office in London, keeps by this means in daily contact with the British Post Office. The Post Office provides the administrative link as well as the physical link between the American telephone systems and the European Continental ones; while the American Telephone and Telegraph Company similarly links up the Canadian, Cuban and Mexican systems with Great Britain and so with the Continent of Europe. This works well, but I think the time will soon come when some more general organisation of inter-Continental telephony will be required. Experiments are being arranged for services between Great Britain and Australia, India and South Africa; there is also an experimental service in existence between Holland and the Dutch East Indies,* and a public service limited in certain respects) has just been opened between parts of Germany and Buenos Ayres. With the growth of these long links, which it may be possible sooner or later to connect up with each other, so as to provide a more or less complete inter-Continental telephone network, some kind of permanent co-ordinating machinery in matters of traffic and rating will be imperative. It is not at present quite clear whether the C.C.I. will be able to expand itself to the necessary degree or not. Its membership is not in theory confined to European countries; indeed, Japan and the Portuguese colony of Mozambique already belong to it, but to make it internationally representative under the new conditions the adherence in some form of the big American telephone systems

* A limited public service has since been opened.

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would obviously be essential. It remains to be seen whether this can be secured.

The C.C.I., like most international committees, works by means of Rapporteurs who meet annually (sometimes more frequently) in the capacity of experts to prepare work for the annual meeting of the main Conference. There will obviously be considerable physical difficulties in bringing experts from different Continents into personal contact frequently enough to cope with all the current problems; but it is much too early to say how this difficulty when it arises could be got over.

I have mentioned that the C.C.I. Rapporteurs meet in the capacity of *experts* from a few of the more experienced countries, as contrasted with the representatives of the Administrations on the Advisory Committee itself, who (though, in fact, many of them are the same individual people) meet in the annual Conference of the Committee in the capacity of *delegates* from the respective Telephone Authorities. I suspect that an examination of the respective functions of experts and delegates might bring to light some of the general principles governing efficiency in international co-operation in public utilities. That, however, is a large subject; and I will only say here that I think it is to be hoped the organisation which will carry on world-telephony will select its Rapporteurs in accordance with the advice given, some two and a half centuries before the telephone was invented, by a British authority on administration—I am quoting from Bacon's Essay on "Counsel":—

> "In choice of committees for ripening business for the Council it is better to chuse indifferent" [i.e., impartial] "persons, than to make an indifferency by putting in those that are strong on both sides."

I want to thank several of my colleagues in the Post Office for help in collecting, translating and checking material for this paper.

REVIEWS.

"Source Books in the History of the Sciences." Gregory D. Walcott, General Editor. Published by the McGraw-Hill Book Company, Inc. Each volume price 20s. net.

This series will be welcomed by all those who take an interest in the stages by which the present mastery of man over nature in the various fields of science has been reached. Each volume contains a series of carefully selected extracts, translated into English, if necessary, from the original writings of the pioneers of some one branch of scientific work during the last 400 years, chosen as to give the reader a continuous view of the development of the science in question. It is deeply impressive to read the accounts of the various epoch-making discoveries in the very words of the men by whom they were made.

The subjects to be dealt with include Astronomy, Mathematics, Physics, Chemistry, Zoology, Geology, Anthropology, and Philosophy. Of these the volume on Astronomy has just been published, and that on Mathematics will follow shortly.

The volume on Astronomy, by reason of the intellectual revolution which astronomical discovery brought about, has an interest for the general reader as well as for the specialist in that subject. The selection of extracts for this volume has been made by Harlow Shapley, Ph.D., LL.D., Professor of Astronomy at Harvard University and Director of the Harvard Observatory, and Helen E. Howarth, A.B., A.M., Research Assistant at Harvard Observatory. The volume contains 412 + xvi pages. It is very well got up, with excellent paper and printing, and many good reproductions of illustrations and letterpress from the original works.

The most noteworthy sections are an extract from the book of Copernicus "De Revolutionibus Orbium Coelestium," in which he advances the theory that the earth is not the centre of the Universe, but that it moves round the sun; Kepler's account of his discovery of the laws of planetary motion; Galileo's description of his early telescopic discoveries; the portion of Newton's "Principia," dealing with the laws of motion and gravitation; Halley's work on comets; Maskelyne's weighing of the earth; Herschel's discovery of Uranus; Gauss' description of his method of least squares; Schwabes' discovery of the periodicity of Sunspots; Adam's discovery of Neptune; and Kelvin's theories as to the age of the earth. Many other extracts are given, and the whole collection forms a complete living record of the development of the subject, which is of absorbing interest.

We shall look forward to the appearance of the other volumes of the series.

"Pioneers of Wireless." By Ellison Hawks, F.R.A.S. Pp. xix + 304. With 24 Plates and 45 Diagrams. London: Methuen & Co. Ltd. Price 12s. 6d. net.

It seems at first somewhat surprising that in a historical survey of this subject half the book is completed before mention is made of the name of Clerk Maxwell, the name which is usually taken as the starting point in the history of radio communication. But Mr. Hawks is careful in his title, "Pioneers of Wireless," not Radio, which means that he must work through not only the pioneers of signalling by Hertzian waves, but also those who contributed to the various methods of electric signalling without wires, by means of conduction and induction. The work of these early pioneers is not nearly so well known as that of the later ones who dealt with the development of radio communication, and the author's interesting account of this early work will, for that reason, be welcomed by those who may feel a little disappointed that more space could not be assigned to the work of the purely radio pioneers.

Mr. Hawks is an old hand at presenting the romance of science in a way which will interest the layman and the expert alike, and so does he present it here. The present writer received the book for review when he was in full-blown occupation of the ante-influenza arm-chair. He felt depressed, and the sight of the book in no way cheered him. He glanced through the chapter headings, he nosed into the index and looked up a few points. That was enough; he started at the beginning and read to the end with great interest and enjoyment, and this was due to the author's presentation of old, and sometimes dry, facts in a humanly interesting light.

The first four chapters deal shortly with the great electrical pioneers from Gilbert to Faraday. The next seven chapters deal fully with the pioneers of conductive and inductive signalling without wires, from Sömmering to Preece, and it will interest Post Office readers to know that Preece's work is well described. Then follows an excellent chapter on the pioneer work of Hughes, which remained so long unhonoured and unknown. Then come three chapters on the great forerunners of Marconi, those whose work the inventive genius and indomitable will of Marconi advanced to a commercial basis. Marconi's early work is well considered in the next two chapters, and it seems then that the author feels that real pioneering is really over, as he finishes off with two chapters which deal very briefly, almost hurriedly, with a few of the later outstanding workers in radio communication.

The book is well produced, has a good index, and is greatly enhanced by photographic reproductions of all the great pioneers. It is a notable addition to the History of Wireless.

"The Practical Electrician's Pocket Book." Edited by F. H. Robinson. Published by "Electricity," 93 Long Acre, pp. 520. Price 2s. 6d.

This useful annual, started by the late Mr. Sidney Rentell and now in its thirty-first year, has again been revised, and while retaining many of its admirable features, has been entirely re-written. Besides special articles on different branches of electrical practice, it contains numerous tables of statistics, data, and useful memoranda. Industrial and domestic electricity, central stations, prime movers, wiring, transmission, electric tools, radio, telephony, and a host of other subjects are covered by this little book, which, as usual, forms a valuable work of reference.

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COMMISSION OF ENQUIRY INTO THE ORGANISATION AND METHODS OF THE AMERICAN TELEGRAPH COMPANIES.

[NOTE.—All the articles in the series, "How to improve the Telegraph Service," which have appeared and are to appear in the *Journal*, were written prior to the publication of this Report.]

RECOMMENDATIONS.

I.

(*a*) *Apparatus.*

(1) Multiplex working should be replaced by teleprinter working on all routes on which it is possible and economical, by means of compositing or voice frequency to provide the requisite number of separate channels. On such multiplex circuits as are retained the channel speed should be not less than 50 words per minute, and type-keyboard and tape printing apparatus, capable of working at not less than 60 words a minute, should be universal. The number of arms should not normally exceed three.

(2) On automatic multiplex and teleprinter routes a considerably higher output than that on which the existing staffing standards are based should be required (*see also* (24) below.)

(3) The process of converting Morse circuits to teleprinter or telephone working should be carried further than has hitherto been contemplated. As a first step, every Morse circuit carrying as many as 200 messages a day at any time of the year should be scheduled for conversion to teleprinter working at the earliest possible date. Concentrator working with teleprinters should also be adopted as soon as practicable.

(4) A uniform type-keyboard should be adopted for all multiplex and teleprinter circuits in the inland service. All other types of keyboard should be replaced by the standard type as rapidly as possible.

(5) Adequate reserve apparatus should be provided at every office at which printing telegraph instruments are used. Morse and Wheatstone should cease to be regarded as stand-by apparatus for emergencies.

(6) The use of Wheatstone apparatus, whether for emergency purposes or for Press work, should be abandoned as soon as possible.

(7) Reception on all Morse and telephone circuits should be by typewriter at the larger offices, and Wheatstone slip should be transcribed by typewriter where Creed apparatus is not in use.

(8) Electrically operated timing stamps should be fitted at the receiving positions on multiplex circuits and the principal teleprinter circuits.

(*b*) *Lay-out.*

(9) Double tables with "V" belt conveyors should normally be provided in the larger instrument rooms; and whenever the phonogram equipment at a large office has to be replaced, the question of installing four-position panels, with two positions on each side of a double table with a belt conveyor, should be considered.

(10) The present type of circulation table should be abandoned at the largest offices, and the moving belt system in use at New York, Chicago, &c., should be introduced.

(11) All apparatus other than that actually required by the operators to enable them to dispose of telegrams should be removed from the instrument tables and accommodated in test rooms or other suitable positions. An exception should be made only in the case of multiplex distributors.

(12) All circuits worked by apparatus of the same type (multiplex teleprinter, Morse, Wheatstone) should be grouped together as far as possible

(*c*) *Maintenance.*

(13) Responsibility for the efficient working of circuits and for the control, adjustment and day-to-day maintenance of apparatus should be definitely vested in the traffic officers in charge of Instrument Rooms.

(14) All testing, regulating and maintenance work in the larger Instrument Rooms should be allotted to officers selected from the operating staff, who must possess the necessary technical knowledge and skill, and should receive an appropriate special allowance. The departmental technical examination, suitably revised, should serve as a qualifying test for these officers, and a scheme of training should be drawn up for those who qualify. The selected officers should normally be relieved of operating duties, but should be liable to be called on to perform them in case of need.

(15) The technical allowance, the additional increment granted to holders of the present Departmental technical certificate, and the allowance to Dirigeurs (who would disappear under recommendation (14)), should be abolished (subject in the case of the two former to the rights of existing holders).

(16) At the smaller offices the day-to-day maintenance should be carried out by the operators (*see* recommendation (22)) subject to periodical inspection by engineering staff.

(17) A life history of each apparatus unit, including a record of faults, adjustments and periodical overhauls, should be kept at every office.

(*d*) *Recruitment, Training, &c.*

(18) The number of offices at which Sorting Office and Instrument Room duties are performed by a common staff should be reduced to a minimum.

(19) At any office at which it is found possible to employ a separate staff for telegraph work, new female entrants on the telegraph side, other than those who will be required to do Morse work, should wherever possible specialise in one of two groups of Instrument Room duties: (1) printing telegraph and phonogram work, and (2) non-operating duties (excluding clerical work). The latter group of duties should be withdrawn gradually from the operating staff. Each new female entrant should receive only the training necessary for the group of duties on which she will be employed.

(20) No new entrant should be recruited for keyboard operating and phonogram work who is unable to pass prescribed digital, auditory and other tests.

(21) In order to ensure an adequate supply of male telegraphists who will be able to qualify for testing and regulating duties, the recruitment of male telegraphists by open competition should be resumed, a certain number of places remaining open to Boy Messengers, who should be required to pass a limited competition.

(22) The training of keyboard operators should be revised and improved, and the qualifying standard should be raised. In the case of operators at small offices with teleprinter circuits, the training should include instruction in the day-to-day maintenance of teleprinters.

(23) So far as possible each operator should specialise on a particular type of apparatus—Morse, teleprinter, multiplex or telephone—and training in Morse working should be confined to operators (including all male operators) who will be employed on Morse circuits. Rotation should be reduced to a minimum, and changes of duty should be allowed only between officers of approximately equal qualifications.

(24) So far as possible the most expert operators should be assigned to the most heavily loaded routes, both multiplex and teleprinter, and a special allowance should be granted for the higher output which should normally be obtained on those routes.

(25) Operators employed on duplex channels should send and receive alternately for periods of two hours.

(26) In addition to the authorised meal reliefs two regular rest reliefs of 15 minutes each should be allowed on any continuous duty of eight hours or more, and one on any continuous duty of less than eight hours. At the Central Telegraph Office, however, where the dinner relief is at present three-quarters of an hour, the dinner relief and rest reliefs should not exceed one hour in all on a duty of eight hours or less.

(27) Casual reliefs should be strictly limited to cases of real urgency.

(28) At the larger offices a time card should be used by each operator.

(*e*) *Supervision and Control.*

(29) In view of the greater concentration of traffic on channels working at high speeds, the size of supervising areas should be reduced in order to secure keener supervision and a higher output; it being understood that in future a more rigorous standard will be applied in the filling of supervising posts and promotion will be restricted to officers who are qualified to give fully effective supervision.

(30) The male supervising grades in Instrument Rooms should normally be recruited from the testing and regulating staff.

(31) A monitorial scheme should be introduced with a view to the detection and prevention of operating errors.

(32) A daily record of output at each circuit should be maintained, and these records should be carefully scrutinised by the responsible local officers, who should take suitable action wherever a low output is disclosed.

(33) A system of centralised supervision of the disposal of traffic over the principal routes should be introduced if the limited experiment already inaugurated proves successful.

(*f*) *Press Work.*

(34) Newspapers should be offered the facility of having special wires led into their offices for the direct receipt of reports of race meetings and other special events, the Post Office providing wires, teleprinter or Morse apparatus and operators for short periods on suitable terms.

(*g*) *Delivery.*

(35) In no case should a telegram for an address in a business area wait at the delivery stage for more than 5 minutes during the normal hours of business.

(36) Boy Messengers should be paid on the basis of distance covered, subject to a fixed minimum according to age, the walks being arranged so as to afford all the boys at an office as nearly as possible equal opportunities of adding to their earnings by increased effort.

II.

(37) Attractive leaflets or "folders" setting forth the usefulness of the telegraph system for speedy communication (both at home and abroad) should be available at Post Offices, and so far as possible in hotels, railway stations, &c. They should also be sent to telephone subscribers with their

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accounts from time to time, and should be distributed from house to house in suitable localities. They should be as unofficial as possible in style, and should aim in particular at dispelling the popular idea that a telegram always brings bad news.

(38) The equipment of the larger public offices should include—in place of or in addition to the existing message stalls—a special glass-topped table, with chairs, for writing telegrams. The table should display the sign "Write your telegrams here" in attractive type and colour, and should be kept furnished with the different types of telegram forms and with serviceable pencils.

(39) The quality of the delivery forms and envelopes should be improved.

(40) The positions of telegraph offices should be more widely indicated by street signs, preferably illuminated.

(41) The facility of summoning a messenger by telephone to collect a telegram (inland or foreign) should be afforded in business districts and in developed residential areas.

(42) Large users of the inland telegraph service—in the first place holders of deposit accounts—should be visited periodically by canvassers, who should enquire as to any casue of dissatisfaction or as to the reason for diminished use of the service, and should make it clear that the Post Office is anxious to maintain contact with its customers and to satisfy their requirements.

(43) Large users should be given the name and telephone number of an officer at the local Head Office—where possible a canvasser—with whom to communicate in any case of difficulty or dissatisfaction.

(44) The convenience of the telephone for sending and receiving telegrams should be stressed by canvassers and by means of small adhesive labels attached to delivered telegram forms. The Night Telegraph Letter service should be similarly advertised where this facility is afforded.

(45) Special delivery forms and envelopes for telegrams conveying greetings at Christmas, Easter, birthdays, &c., should be designed, and appropriate formulæ for these occasions should be suggested (though not insisted on). These telegrams should be subject to the ordinary tariff and treatment.

January, 1929.

PAYING THE PENALTY FOR LOW TELEPHONE RATES.

THE Chicago journal *Telephony* gives an interesting instance of the control which State Railway Commissions have in America over corporations and companies authorised to carry on telephone business :—

"Nebraska has a Guaranty Fund Commission which takes over the management of crippled banks, collects and realizes on their assets and makes up any deficit so that all creditors are reimbursed. In the course of business the Commission has found itself in charge of merchandise stock, mills, markets and various other lines of industries which it was able to liquidate without much trouble—these concerns having been debtors to the banks taken over. . . . Finally the Commission took over a bank which had a claim against a small telephone company that had been operating under too low service rates. The company was losing money, and the Commission closed down the exchange without regard to the wishes of the subscribers or without consulting the State Railway Commission.

The telephone users affected made a prompt complaint, and the Railway Commission asked the Guaranty Fund Commission "How come?" The latter said the answer was perfectly plain. The telephone company was losing money, the creditor bank could not afford to lose any more—hence, the finish.

The State Railway Commission at once served notice on the Guaranty Fund Commission that it must reopen the exchange and give service to the public, under the state utility law, or else defend an action in court. . . .

According to both the letter and spirit of the utility law, the Railway Commission is undoubtedly right in holding that the public must continue to have telephone service, regardless of the financial health of the company providing it. At least, that, having agreed to provide it, the company cannot quit without permission of the authority which permitted it to begin business."

There are reports nearly every week in the columns of *Telephony* of applications from small country telephone undertakings to Railway Commissions for permission to increase their rates. If the above-mentioned instance of the penalty for closing down an unprofitable exchange is typical, we should imagine that there was good reason for dealing sympathetically with the local companies' prayers.

The article "Broadcasting Developments" by Capt. P. P. Eckersley which appears in our List of Contents has been held over for revision.

CORRESPONDENCE.

TO THE EDITOR OF "THE TELEGRAPH AND TELEPHONE JOURNAL."

Sir,—A very heavy item in the Telegraph costs is the delivery of telegrams. Whether received by telegraph or telephone I take it, telegrams will always have to be delivered. The scheme I am about to submit may be revolutionary, but it is bound to come sooner or later.

Item 1.—Compel all subscribers to receive telegrams by phone. This might require a little diplomacy at first, but ultimately, with a little wise discretion, resisters would fall into line.

Item 2.—Appoint subscriber agents within well defined areas paying them a fee for delivery. These subscriber agents would pay the usual rentals for business or private installations, and be credited with the delivery fees in the accounts.

Item 3.—In outlying districts when the cost of delivery is heaviest, make it a condition in the contract that the nearest subscriber to the address must undertake to deliver telegrams.

Such subscribers to be charged a modified rental and paid delivery fees.

Item 4.—Where it is possible a line to each village or group of villages, if in close proximity, should be provided by the department on a commission basis.

Item 5.—Boy messengers only to be employed in populous areas where the number of telegrams warrants this means of delivery.

Under such a scheme it would be possible to reckon the actual cost of delivery of each message. I submit these proposals for discussion in your paper.

SMALL OFFICE.

P.O.A.C. HOME NURSING AND FIRST AID.

An interesting distribution of the awards gained by members of the staff of the Controller's Office during 1928, was made by the Controller, supported by Mr. Stirling, Miss Liddiard and Mr. Bold, in the Conference Room on Wednesday, Mar. 13 last.

The awards consisted of :—

Women (*Home Nursing*).	*Men* (*First Aid*).
4 Certificates.	4 Certificates.
1 Voucher.	5 Vouchers.
3 Pendants.	3 Medallions.
	1 Label.

The Controller, after reading the reports of both sections, referred to the feeling of uselessness one has in looking on in cases of accident or need where the bystander has not the necessary knowledge to be of assistance.

He also mentioned the old proverb, "A little knowledge is a dangerous thing"; but with this he coupled the saying, "Knowledge is power," and indicated that even where the knowledge is little, provided it is properly applied and its limits not exceeded, it can be of real power.

An appeal was also made for greater enthusiasm and activity.

Attention is therefore drawn to the local organisations which exist for the purpose of imparting this knowledge.

So far as the ladies are concerned, Miss C. M. Stephen (A.R.3A) would gladly give any information concerning the arrangements and lectures for Home Nursing, while for First Aid, all particulars will be willingly supplied by Mr. Sydney J. Smith, (A.O.3B).

If, therefore, any member of the Controller's Office is desirous of taking either of these interesting and useful subjects please do not fail to enquire of the above-mentioned local secretaries or of any member of the respective branches.

PRESENTATION TO MR. H. V. J. HARRIS, SOUTHAMPTON.

ADVANTAGE was taken of a break in the Conference of Telephone Supervising Officers which took place on Jan. 23 last to present Mr. H. V. J. Harris, Assistant Traffic Superintendent, with a handsome oak chiming clock on the occasion of his marriage, which took place three days later. Mr. O. G. Lee, District Manager, in making the presentation on behalf of the Staff, advocated in no uncertain way the "Married state," and wished Mr. Harris and the future Mrs. Harris a very happy future.

Mr. A. L. May, Traffic Superintendent, associated himself with the District Manager's remarks and on behalf of his colleagues in the Traffic Section he extended his very best wishes. Mr. Harris, in a short reply, thanked the District Manager and those present for the very acceptable gift and for their kind wishes.

Members of Postmasters' and the Sectional Engineers' Staffs associated themselves with the presentation.

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EDUCATING THE PUBLIC IN AUTOMATICS.

THE success of an Automatic Telephone System depends very largely upon the manner in which the dialling operations are carried out by telephone users, and it is, therefore, necessary that all subscribers and as many members of the telephone public as possible, should be instructed in the use of the new system. It is the practice for every subscriber about to be changed to automatic working to be visited by an officer of the Instruction Staff, and to be given a personal demonstration on his own instrument by means of a demonstration unit installed at the new Exchange to which connexion is made through the Manual Exchange. In addition a model of the Automatic System is installed in each area about to be converted, and all subscribers and the general public in that area are invited to visit the set in order that the working of the new system may be demonstrated to them.

In London we have gone a step further than this during the past few months in our efforts to educate the public in automatics, and this has been done by giving demonstrations at suitable exhibitions. The first demonstrations of this kind were given at a business exhibition in the early part of last year, and the new departure was embarked upon as much in the nature of an experiment as anything else. The venture proved a success, however, not merely from the point of view of the large number of people who were present at the demonstrations, but owing to the fact that an appreciable amount of experience was gained as to the attitude of the general public towards the new system. During the demonstrations questions were encouraged, and in this way much information on all points relating to telephone matters in general were given and many erroneous ideas dispelled. As a result of this exhibition the model set was elaborated, and we are now able to demonstrate the working of the Director as well as the Strowger switches.

During the past 12 months this model apparatus has been installed at four Exhibitions, and by this means alone approximately 20,000 people have had definite instruction in the working of the automatic system. It has been responsible for some new business too.

W. H. M. W.

C. B. CLAY FOOTBALL CHALLENGE CUP.

THE final tie in the C. B. Clay Challenge Cup was played on the Tufnell Park Football Ground on Tuesday evening, April 16, between teams from the Post Office Stores Department (Holloway) and the Engineer-in-Chief's Office.

A good crowd of spectators turned up to see what proved to be a typical Cup Tie game between two very equally balanced sides. The Stores Department led at half-time by 2 goals (scored by W. Williams and A. Jones).

After the change-over the Engineer-in-Chief's Office pressed strongly and succeeded in equalising by means of goals by Hind and Granger. A most exciting finish then ensued. The Stores Department scored a third goal through Blower, and then Meridith, of the Engineer-in-Chief's Office, made the scores level again. Although both goals had many narrow escapes, full time arrived without further score and it was, therefore, necessary to play extra time. In the last 10 minutes, and as the shades of night were falling, the Engineer-in-Chief's Office managed to elude the Stores Department's defence, Meridith and Larkham scoring goals, so the Engineer-in-Chief's Office became the holders of the Cup after what was agreed by all present to be one of the most exciting contests they had seen.

Col. C. B. Clay, the donor of the Cup, was unfortunately unable to be present owing to an attack of ptomaine poisoning, and in his absence the presentation of the cup, together with miniature cups to each member of the winning team was made by Mr. H. Sparks, O.B.E., the Controller of Stores. Mr. Sparks paid a tribute to both teams for the excellent game they had played and also said he was sure all present would wish Col. Clay a speedy return to good health.

It may interest readers of the *Journal* to know that this Football Challenge Cup was first instituted in 1898, and is still open to all teams representing the staff of any branch or section of the Post Office associated with the Telephone Service in London, including the following departments:—

The Secretary's Office.
The London Telephone Service.
The Post Office Stores Department.
The London Engineering District.
The Office of the Engineer-in-Chief.

Entries for the competition are cordially invited, and particulars can be obtained from the Hon. Secretary, Mr. C. J. Head (London Engineering District), Mr. A. E. Wild (London Telephone Service), or Mr. F. Woollard (Engineer-in-Chief's Office).

The proceeds of all matches are devoted entirely to charity, and the competition has been the means of raising over £200 during the past two two or three years.

G. V. DOWDING.

BY W. T. L. (OF THE C.T.O.).

BY the time these lines appear in print the wireless synchroniser—which will enable those people fortunate enough to possess both wireless and amateur cinematograph apparatus simultaneously to hear and see broadcast plays, &c.—may be on the market, the B.B.C. at the time of writing carrying out exhaustive tests. From what I hear the apparatus is simplicity itself, and when adjusted ready for use, the announcer will quote a number corresponding to that of a particular film, which will be a pictorial reproduction of the item about to be broadcast.

Even in the C.T.O. there are many who fail to recognise in the name of the inventor a one-time colleague.

It cannot be as long as ten years since George Dowding, as we knew him then, showed his application for resignation to the writer, on which he stated that his reasons for leaving were "private." That was characteristic of him. Modest to a degree, G. V. D. gave one the impression that his abilities were very limited.

At that period the only "wireless" periodical on the market was the *Wireless World*, but the public wanted something a little more picturesque, and not quite so technical; and here our old friend showed us that he could see a little further than his nose, for that bright little journal, *Popular Wireless*, owes its existence to him. He was the originator of the book, and when it was but a few weeks old George bid good-bye to officialdom and departed for the Street of Adventure, as Assistant Technical Editor of the then new publication. It is now some time since he was promoted to the position of Technical Editor.

For some time prior to his resignation our brilliant subject showed considerable ability as the writer of a number of articles on the subject of wireless that were published in the Press. He cannot be much more than in the early thirties at the present day, and, it is understood, can claim more than a nodding acquaintance with that famous scientist of occult and earthly mystery—Sir Oliver Lodge.

Yet another name added to the long list of genii that have sat on official chairs by our side.

STAFF HOSPITAL COLLECTIONS—LONDON.

THE Annual General Meeting of the Post Office Telephone Staff Hospital Collections (associated with the Hospital Saturday Fund), was held on Wednesday, Feb. 13.

Mr. Valentine, the Chairman, reviewed the position of the Fund for some years past and showed how the contributions had grown from comparatively small beginnings until they had now reached the large sum of £2,422 11*s.* 6*d.* last year. He expressed the hope that the desire of the Secretaries to reach the sum of £2,500 would be reached this year, and in congratulating them on the work that they had performed, he also expressed the view that their desire would be attained. He said how much he admired the unbounded generosity of the Exchange Staffs, not only in connexion with the Hospital Saturday Fund but in many other directions.

The report of the year's work was presented by Miss Reekie, one of the Secretaries, who intimated that the Committee were delighted with the response to the Fund, and pointed out that this year's collections were larger than last year, although the hoped for £2,500 had not yet been obtained. The number of benefits issued by the Fund had increased and all sections of the staff had benefited from the Fund.

It is hoped that the interest of the staff in the Hospital Saturday Fund will be further stimulated this year, and that not only will £2,500 be collected, but that high tide will be reached at a far larger amount. So collectors, do your best!

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TELEGRAPHIC MEMORABILIA.

AUSTRALIA.—According to the *Electrician*, the Wireless Branch of the Commonwealth Postmaster-General's Department, there were at the end of September last about 300,000 licensed listeners in Australia. The Postal Department, too, has accepted a tender for the introduction of a service of telegraph transmission of pictures between Melbourne and Sydney. It is expected that the service will be available for public use by the present month. The contract has been let to the British General Electric Co., Ltd., the patent rights of the transmitting plant being by a German company, Siemens & Halske. The British General Electric Co. acted as agent for the German company. Two other tenders, says *The Electrical Review*, were received, one from an American telephone company, and the other from a Melbourne firm, which has been formed to experiment with and exploit the transmission of pictures.

AUSTRIA.—Herr Oskar Czeija, general manager of the Austrian Broadcasting Company, recently drew the attention of members of the Vienna Scientific Club to the ambitious goal which the constructors of the Zoffen station had set themselves—the transmission of a programme which could be received at any point on the earth's surface, says *The Times*. The Dutch station at Huizen was nightly entertaining Dutchmen in the Dutch Indies. The broadcasting experimental department at the Academy of Music in Berlin was groping after an art peculiar to "broadcasting" in which exponents would be specially trained. On the technical side effort was everywhere concentrated on the construction of a receiving set with automatic, highly selective powers, which on the mere pressure of a button would instantly adjust itself to any desired wavelength.

CANADA.—The Canadian Royal Commission returned to Canada last month to confer with the provincial authorities. The Commission, which consists of Sir John Aird, as president, Mr. Charles Bowman, and Dr. August Frigon, spent a month in London in consultation with the B.B.C., and has visited the main Continental centres. The Commissioners are hopeful that, by the time a chain of powerful stations is built across Canada, it will be possible to arrange for a regular weekly programme of British broadcasting for Canadian listeners.

Canada's first automatic wireless beacon was inaugurated on April 6 on Seal Island, off Nova Scotia. It is the first of a chain of seventeen beacons stretching from the Gulf of St. Lawrence to the Great Lakes.

The new list of radio stations shows two new stations. One is CJRX, 25.6 metres, 2 kw., which broadcasts simultaneously with another station owned by the same company at Fleming, Sask. (CJRW—296.9 metres). In connexion with the change of CKY, at Winnipeg, from 0.5 kw. to 5 kw., CKX has been opened at Brandon, Man., with the old station that used to be CKY. There are now 78 broadcasting licences in the Dominion, not all of which are in use.

CZECHO-SLOVAKIA.—An International Wireless Conference opened at Prague on April 4. Delegates of 27 European and three non-European telegraph administrations attended, of eight telegraph companies, the International Union of Wireless Telegraphy and the International Committee of Aeronautics. A discussion took place on the Wireless Telephony Committee on the Czecho-Slovak proposals recommending the so-called "Brussels plan" as the basis for the distribution of "radiophonic waves" and co-operation between the World Telegraph Union of Berne and the Wireless Telephone Union of Geneva. A modification of the Brussels Plan known as the Prague Plan was unanimously adopted.

DUTCH EAST INDIES.—The British Commercial Agent at Batavia (Mr. H. A. N. Bluett) has prepared a very interesting report on the economic conditions in the Dutch East Indies. From a mine of useful information the following is selected as indicative of the possibilities of a market for radio apparatus in the not too distant future :—

"Considerable development," says the Agent, "has taken place in radio-telegraphy, and there is now direct communication with Holland, Germany, France, the United States, French Indo-China and Manila. Greater efficiency has been attained by a more extensive application of the short-wave system and automatic reception. Experiments with radio-telephony have been made, and although considerable difficulties have still to be overcome, it may be expected that the Post and Telegraph Service will shortly inaugurate a public service. So far no progress has been made in the formation of a local broadcasting company, though it may be anticipated that a concession for radio broadcasting will be granted soon."

FRANCE.—*News by Wireless but three hours late!*—Reuter's Paris correspondent reports that the Bill which is shortly to come before the French Parliament, defining the rights and conditions of broadcasting, will raise the question of the censorship of programmes. Two suggestions will be put forward, one emanating from Mr. Francois-Poncet before he was appointed Under Secretary of State for Fine Arts, and the other from the Government. Objection is being taken to the Government's proposal, which would delay most news by three hours.

The Eiffel Tower wireless station, which for six years has been worked on a wavelength of 2,650 metres, is apparently still undergoing readjustment for 1,465 metres, says *The Electrical Review*. This wavelength has been chosen to obviate the difficulty of the Eiffel Tower swamping Daventry and Radio-Paris, but very delicate adjustment will be required to prevent interference with the Paris airport of Le Bourget, where specially selective apparatus is to be installed.

For some time past, says the same authority, an autographic telegraph service has been in operation between Paris, Lyons, Strasburg, Marseilles, Nice and Bordeaux, by means of which telegraph messages are transmitted in the handwriting of the senders. Hitherto such messages have had to be written with a special syrupy ink, but as the result of improvements recently effected by Mr. Belin, they can now be written with ordinary ink, or even typewritten.

GERMANY.—The Funk-Stunde, Berlin, has sold the Voxhaus in the Potsdamer Strasse, where the company has had its studios and offices since its foundation in 1923, and has acquired land on which it is intended to construct a new Funkhaus for the Berlin stations. It is hoped to begin work on the new building this summer, and to complete it by the end of 1930. The new headquarters will contain the offices and studios of the Funk-Stunde and Deutsche Welle, G.m.b.H. (the company controlling the Deutschlandsender at Königswusterhausen), and the offices of the Reichs-Rundfunk-Gesellschaft and Reichs Broadcasting Commissioner. There will be several large studios, and room has also been provided in the plan for a broadcasting museum. The site is quite near the Radio Exhibition Halls at Witzleben.

The German Atlantic Telegraph Co. recommends the payment of a dividend of 7%, as for 1927. The traffic is reported to have further increased, especially on the line between Emden, the Azores and New York. The question of the laying of another cable between Emden and the Azores is under consideration.

GREAT BRITAIN.—The B.B.C. announces that the address of the north regional studios and offices are Broadcasting House, Piccadilly, Manchester. The old accommodation at Orme Buildings has been vacated, and the first programme from the new premises was broadcast on April 8. The new premises are situated on the north side of Piccadilly, overlooking the municipal gardens.

Fultograph Progress.—In view of improved processes in transmission, the B.B.C. has adjusted the times and stations allotted for picture transmissions outside programme hours as follows: *Afternoon transmissions*—station 5XX from 2 to 2.25 p.m. on Tuesdays and Thursdays. *Night transmissions*: stations 2LO and 5XX from midnight to 12.15 a.m. on Mondays and Fridays; and station 5GB from 11.15 to 11.45 p.m. on Wednesdays and Saturdays.

The daily weather charts are also to be transmitted by wireless, according to Mr. R. A. Watson Watt, Superintendent of the radio research station at Slough, in the course of a lecture delivered by him before the Royal Meteorological Society on "Weather and Wireless."

According to the *Financial News*, Mr. Watt said that experimental transmissions would be made from Daventry by the Fultograph system. Wireless as a means of communication, the lecturer went on to say, was essential in modern meteorology, because it alone was capable of giving sufficiently rapid interchanges of data over wide areas.

HOLLAND.—Reuter's Hague agency reports that the first conference of the International Consultative Technical Committee of Wireless Communications will take place at The Hague at the end of September, and will probably last ten days.

HUNGARY.—Reuter announces from Prague that Hungary will participate in future in the fortnightly exchange of programmes between the countries of Central Europe. International broadcasts have been given regularly by Germany, Austria, Czecho-Slovakia, and Poland, since June 11, 1928, when the first relay was made by Berlin to Vienna, Prague and Warsaw.

INDIA.—The Indian correspondent of *The Electrical Review* informs us that the trading branch of the Indian Radio Telegraph was not satisfactory during its first complete year's operations. Side by side with this comes, through the medium of the London *Times*, the report of the Indian Broadcasting Co. for the past year, which shows a loss of two lakhs 15,000 rupees (£16,125), the total loss sustained by the company to date being three lakhs 82,000 rupees (£28,650). The directors consider that the loss would have been much less but for two important disabilities from which the company suffers. In spite of the prosecutions undertaken by the Government of persons found possessing receiving sets without licences, there is still much piracy which deprives the company of legitimate revenue. The company is also unable to collect all the amounts due as a 10% tax on wireless imports, and, according to *The Times*, it is negotiating with the Government over means to cover up loopholes through which such losses occur.

On the other hand, the same correspondent of our company also reports that the first complete year's operation of the beam telegraph service introduced by the Indian Radio Telegraph Co. has resulted in a gross profit of Rs. 10,18,000. After making provision for depreciation and reserve, total dividends of 10% on ordinary shares and 4% on deferred shares have been declared. From the date the service was inaugurated, the company handled a much greater volume of traffic than was anticipated. The staff was therefore augmented and put into a much better position for dealing with the requirements of the service in all its branches. A significant feature of the increased traffic is the large proportion of "full rate" messages, almost all of which are sent in code. This particular feature is the best evidence that the accuracy

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and speed of the service are meeting the requirements of the public. There has also been a marked increase during the year in the cheaper classes of traffic, and in this direction the company looks for great expansion of the existing Anglo-Indian circuit. During the past year, in co-operation with the Government of India and the British Post Office, the company extended the facilities for "daily letter telegrams" and "week-end letter telegrams" to many countries.

The company's service still suffers from the handicap of the absence of its own land lines between Bombay, Calcutta and the other large commercial centres in India. Negotiations are in progress with the Government of India, and if certain proposals which have been made are adopted, this state of affairs may soon be remedied.

The extension of the present wireless service to other countries is engaging the attention of the company's board, and the Government of India has assured the company of its support and has promised sympathetic consideration of any developments of this nature. It is also known that the establishment of a system of wireless telephony between India and Great Britain, utilising the beam for that purpose, would meet with the approval of the Government of India.

ITALY.—Plans for the erection of a receiving and transmitting wireless station at the Vatican City in Rome have been agreed upon.

JUGO-SLAVIA.—The new broadcasting transmitter at Belgrade, a Marconi 9-kw. installation, having satisfactorily completed its tests, was officially opened on Mar. 24. The transmitting station is in the centre of Belgrade, in the Academy of Sciences, and three studios will be used in the production of the programmes. The aerial is suspended between masts approximately 80 feet high which have been erected on the top of the building, and the transmitter works on a wavelength of 452 metres with an aerial energy of about 2 kw.

SWEDEN.—Reuter's Trade Service informs us from Stockholm that the Swedish Telegraph Board has given the Marconi Company, of London, an order for equipment for a new 60-kw. broadcasting station near Stockholm. The cost of the equipment will be about Kr. 400,000, and delivery is to be made next November.

SWITZERLAND.—From Geneva we learn that the Committee of the League of Nations on Communications and Transit has adopted the reports of the Special Committee of Press Experts regarding telegraph and telephone facilities for the Press which are to be considered by the Telegraph Conference in 1930. The Committee further endorsed the recommendation of the Press Experts' Conference regarding greater facilities for communication by wire and wireless between Europe and Eastern countries and North and South America.

U.S.A.—*More Radio Problems!*—The Court of Appeals of the District of Columbia has delivered a judgment which is likely to cause the Federal Radio Commission serious embarrassment in future. Station WGY (Schenectady), operated by the General Electric Co., took legal action against the Commission when it refused to renew the station's broadcasting licence on a full-time basis. The Commission was obliged, by the equalising requirement of the Davis amendment to the Radio Act, to curtail the time allotted to one or other of the powerful stations operating in Columbia, and the appellate court which heard the appeal ruled that curtailment of the Schenectady station's time was not justified.

This is the first decision of the kind made by an appellate court designated in the Radio Act to settle disputes. Its importance is the fact that henceforth the ruling of the Radio Commission on any station's comparative utility is legally open to serious challenge, and unless it appeals successfully to the Supreme Court of the United States against the judgment it is likely that other stations will begin legal action against its rulings.

Labour's Own Broadcasting Station!—Station WCFL in Chicago has been added to the National Broadcasting Company's system. It is the only important broadcasting station in America that is controlled by labour organisations, being owned and operated by the Chicago Federation of Labour and supported by the American Federation of Labour, and subscriptions from the thousands of members of organised labour. It has a power of 15 kw., and operates at a frequency of 970 kh (309.1 metres). It recently received a permit from the Federal Radio Commission for a 50 kw. transmitter.

Coincident with the announcement that it is now on a self-supporting basis, the National Broadcasting Company added four southern stations to its coast-to-coast network, which forms the largest group of associated radio stations in the world. The four stations are: WSMB, in New Orleans; WAPI, in Birmingham (Ala.); KTHS, in Hot Springs; and WIOD, in Miami Beach.

It is estimated that there are now over 1,200 factories in the United States devoted exclusively to the production of radio sets and accessories and that 320,000 people are engaged in the industry.

GENERAL AND PERSONAL.—*Parliamentary notes and queries.*—On Mar. 19, Mr. Scrymgeour asked the Postmaster-General if his attention had been called to the fact that during the recent fire at Llandudno post office a Post Office engineer prevented a fireman from spraying the switchboard with water, "thus averting serious explosions," and if he would state what steps were taken to avoid such a possibility occurring in offices having a large amount of electrical gear.

Sir W. Mitchell-Thomson said that the Post Office engineer prevented the fire brigade from spraying the power plant with water in order to minimise damage, but there was no risk of an explosion. At all telephone exchanges of comparable size, engineers were continuously in attendance.

The Bill promoted by the Pacific Cable Board to protect the pension rights of the staff was passed for second reading in the House of Commons on Mar. 25. Mr. A. M. Samuel, Financial Secretary to the Treasury, said the terms had been settled by the Communications Company. The partner Governments were parties to them, and until the Government received their reply it was not in his power to state those terms.

Contracts and Companies.—South African Railways and Harbours, May 16.—Supply and installation of electric signalling apparatus at Johannesburg. (Reference B.X. 5,165.) Postmaster-General's Department, Melbourne. May 28—Supply of telephone jacks and number plates (Schedule C. 417). (Reference B.X. 5,202.) Department of Posts and Telegraphs, Pretoria. May 30—Supply of telegraph materials, tubular arms, crossheads, bases, &c. (A.X. 7,767.)

N.B.—The references between brackets are those to be used when applying to the D.O.T., for particulars, &c.

The directors of the Postal Telegraph and Cable Corporation have declared a quarterly dividend of 1¾% on the 7% non-cumulative preferred stock, payable April 1.

The Eastern Telegraph Co. Ltd. have paid a dividend of 2½% to end of quarter Dec. 31, 1928, and the Eastern Extension a final dividend for 1928 of five shillings. In the case of each company this is free of tax.

The Direct Spanish Telegraph Co., Ltd., again paid 10% free of tax for 1928.

Local Items.—The following list of promotions in the Cable Room is the longest it has been my pleasure ever to have recorded in these columns, that is to say, over a period of nearly 15 years. To one and all then the sincerest felicitations to a group of men each one of whom has well-earned the confidence of the Department: Messrs. E. E. Street, R. F. Dollin, A. B. H. Brown, J. P. Fox, and A. O. Batten promoted to Assistant Superintendents, and Messrs. W. C. Hughes, F. Land, H. Moore, A. W. Pepper, F. T. Skinner, H. Savage, W. H. King, F. A. Randall, W. H. Evans, S. Doran, W. T. Craven, A. Bath, J. F. Smith, Sr., W. E. Tutt, D. D. Deadman, E. R. Widgery, H. Champ, T. H. Motton, G. W. Foley, G. Collins, W. T. Moon, W. H. Bird, R. Rennie, A. E. H. Skinner, W. J. Henn, and P. W. P. Hemmens, all to Overseer rank. To these must be added one provisional appointment to each of the above classes to Messrs. H. A. Hodgson and A. E. Millett, to whom also one's optimism permits itself to offer similar congratulations.

Obituaries.—With deep regret the following are recorded, and the sincerest sympathy proferred to the bereaved relatives: Mr. W. M. Mason who entered T.S. in 1871 and for many years onwards was attached to the old "Stock" office, passed away at St. Leonards-on-Sea on Mar. 21. He retired in 1918 then holding the rank of Asst. Supt. II.

Mr. T. F. Bennett, who died from heart failure on April 3 in his sixty-ninth year, entered the Telegraph Service in 1876 was promoted Overseer and Senior Telegraphist 1898, and Asst. Supt. 1907, leaving the Service upon reaching the age-limit in 1920. He was of a retiring disposition but earned the affection of all those who knew him intimately inside or outside his office duties. Writes one of these, "he was always of a very unobtrusive character during the whole of his long official life and service, while it is pleasant to record that he appears never to have made a single enemy."

Retirements.—Mr. J. G. Smith, Overseer of the Cable Room—yet another of the diminishing band of employees who were transferred to the Post Office with the merging of the Submarine Telegraph Company's business in 1889, retired upon reaching the age-limit during the last week of March last.

Temperaments and circumstances differ, and thus not to all is it possible to leave behind so real and so many genuine regrets at saying goodbye to a supervising officer and a real colleague, as was the case with Mr. Smith. Uncompromising in his integrity and his convictions, "Jakob" Smith had never been known to "let anyone down." He is not likely to forget his send-off of Mar. 29 1929.

The Optimism of youth and age.—For your young men shall see visions and your old men dream dreams.—*Joel.* J. J. T.

ST. ALBANS DISTRICT NOTES.

ON Friday, Mar. 8, a Whist Drive and Dance was held at the Faulkener Memorial Hall by the District Office staff. A very enjoyable evening was spent by all present, which included Mr. J. H. Wilson, District Manager, Mr. A. J. Sharpley, Sectional Engineer, Capt. H. E. Parry, Traffic Superintendent, and Mr. H. C. Sampson, Head Postmaster of St. Albans. Representatives from several exchanges in the district were also amongst the company. A vote of thanks to Mrs. Sharpley, who kindly presented the prizes, was voiced by Mr. Wilson, and the touches of humour in his brief speech, and that of Mr. Sharpley, who replied, caused much amusement.

The duties of M.C. for the evening were ably carried out by Mr. S. H. Croft, Assistant Traffic Superintendent, whilst the arrangements for refreshments—an important feature of such functions—were in the capable hands of Miss H. E. Murfitt, Travelling Supervisor.

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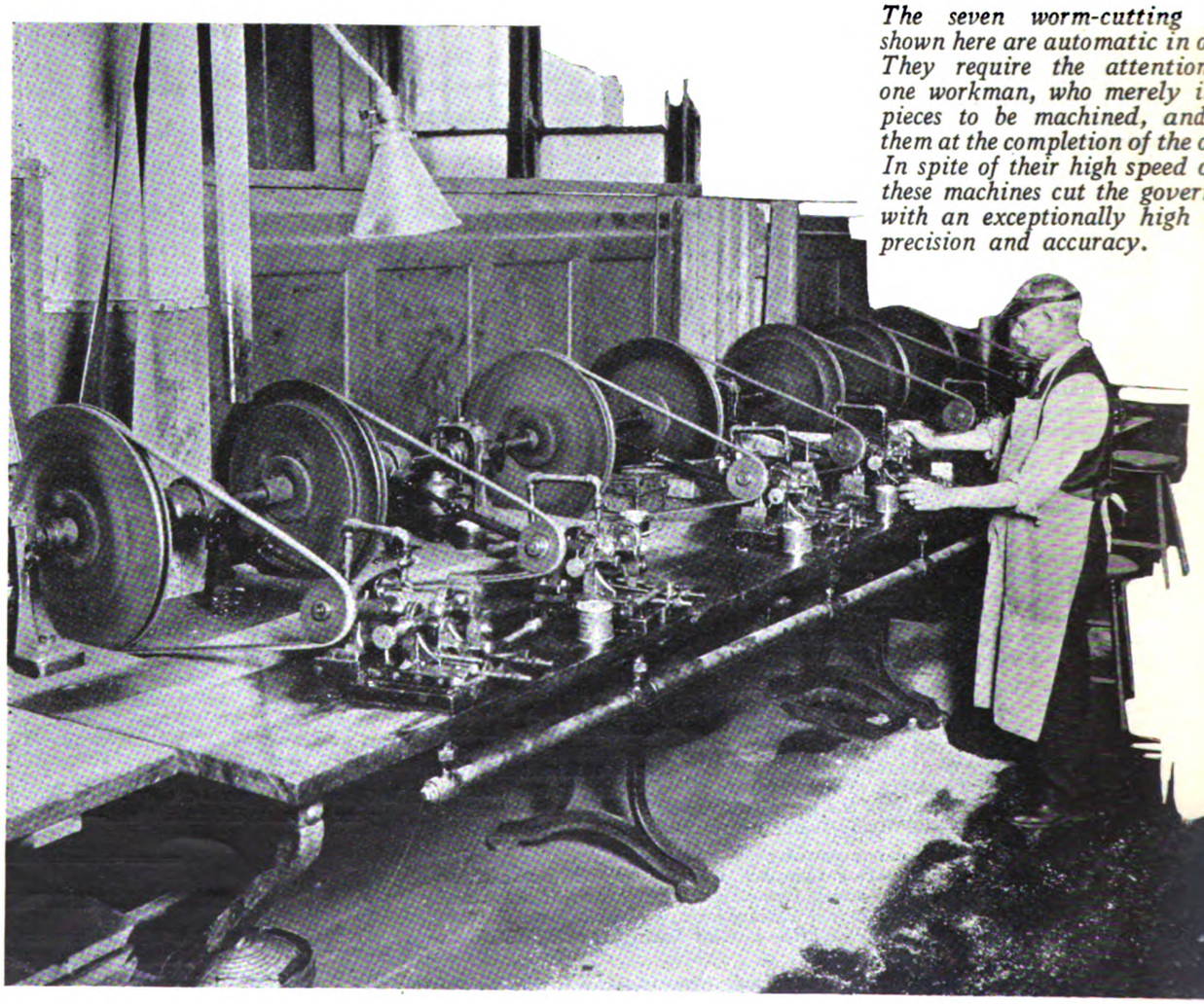
Maintaining Strowge

Specially Designed M



The seven worm-cutting m shown here are automatic in op They require the attention one workman, who merely ins pieces to be machined, and them at the completion of the op In spite of their high speed op these machines cut the governo with an exceptionally high de precision and accuracy.

STROWGER

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utomatic Supremacy—

for Special Purposes

THE Type 24 dial developed by Automatic Electric Inc. has established new records of endurance and reliability, far surpassing anything heretofore produced. Among the several reasons for this dial's remarkable durability, one of the most important is the high grade of fine machine work which is done on its various component parts. The governor worm particularly requires workmanship of the highest order in its manufacture.

To cut this governor worm with the required precision and accuracy, it was necessary to design special machines some of which are shown in the accompanying illustration. They are but a small portion of the large number of machines throughout the factories of Automatic Electric Inc., which have been specially designed and constructed to fill some specific function in the manufacturing process, which cannot be satisfactorily accomplished with standard tools and machinery. The correct design and satisfactory operation of these machines have been made possible by the years of experience which Automatic Electric Inc. has had in manufacturing Strowger Automatic equipment.

[*This is one of a series of advertisements illustrating the exacting care exercised in the production of Strowger Automatic telephone equipment, which is thus kept constantly in advance of the telephone art.*]

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The
Telegraph and Telephone Journal.

PUBLISHED MONTHLY IN THE INTERESTS OF THE TELEGRAPH AND TELEPHONE SERVICE, UNDER THE PATRONAGE OF THE POSTMASTER-GENERAL.

Editing and Organising Committee - - - J. STUART JONES. W. D. SHARP. J. F. STIRLING. W. A. VALENTINE. J. W. WISSENDEN.

Managing Editor - - - W. H. GUNSTON.

NOTICES.

As the object of the JOURNAL *is the interchange of information on all subjects affecting the Telegraph and Telephone Service, the Managing Editor will be glad to consider contributions, and all communications together with photographs, diagrams, or other illustrations, should be addressed to him at the G.P.O. North, London, E.C.*1. *The Managing Editor will not be responsible for any manuscripts which he finds himself unable to use, but he will take the utmost care to return such manuscripts as promptly as possible. Photographs illustrating accepted articles will be returned if desired.*

VOL. XV. MAY, 1929. No. 170.

CALL OFFICE DEVELOPMENT.

A BRANCH of telephone development to which attention may be drawn is the growth of the call office system. There are at present 25,767 call office stations in this country, a number actually equal to the total number of subscribers' stations in the British Isles in the year of Queen Victoria's jubilee. There is no doubt that the multiplication of call offices and especially kiosks in conspicuous and convenient places adds greatly to the general usefulness of the telephone service, and affords useful propaganda work by inculcating the telephone habit in the public. The number of kiosks increased in 1928 from 4,196 to 6,201, of which latter number 1,214 were in London.

The extension of the rural call office system which has of late received a good deal of public attention, is an interesting but more complex feature of telephone development. To extend this convenience to remote and sparsely populated villages which are unlikely to make even 4 calls a day, however urgent their need of rapid communication without the outside world may be, is an economic problem which only a national system not conditioned entirely by questions of profit-earning can adequately handle. The lay mind seldom realises the large outlay of capital and annual maintenance charges required to carry a telephone line to a distant village, and to provide daily service, and how difficult it is to cover these costs by the returns from a few calls per day. It is gratifying to know that the number of rural call offices has increased from 5,804 in 1924 to 7,989 in 1928, and the telephones in rural railway stations has risen from 480 to 1,036 in the same period. The new Budget proposals, as most of our readers are aware, foreshadows a scheme for equipping five-sixths of existing village post offices and rural railway stations not so equipped, with public telephone service in the near future. This will go far towards fulfilling a long-standing requirement in rural districts. The call office question is one which makes its strongest appeal to the steadily diminishing body of citizens who are not telephone subscribers; and to those to whom the call-box is the only means of participating in the most rapid and personal form of modern communication it is a matter of great moment.

HIC ET UBIQUE.

THE Anglo-Continental telephone service continues to spread eastward. On April 17 public service was opened between this country and the south-western parts of Finland, including Helsingfors and Abo. The charge for a day call of 3 minutes' duration is 21*s*.

During last month the transatlantic service was extended to Gibraltar and Ceuta on the Northern coast of Africa. It is thus now possible to speak from America to Africa via London.

It is reported that service was opened on April 2 between Hungary and Rumania. This is a step towards placing the Balkan countries in telephonic communication with central and western Europe.

Telephone operators may take on a new pride in their profession. Not only do they carry on an indispensable public service, but it is also claimed for them by Mr. Bernard Shaw that they are serving to keep alight the torch of articulate English. He is reported to have said:

"People drop their vowels and syllables and everything else, and at the present time they just make a noise. How on earth they make themselves understood to each other is difficult to know.

"It is pure laziness, but the language, fortunately, is being preserved by telephone operators and wireless announcers, who have to be distinct and articulate. When the language is dead to all intents and purposes it will survive in this way.

"The country districts are learning a good deal in this way, and even, in time, actors will begin to speak intelligibly through this means."

According to the *Nottingham Evening Post* an important firm of merchants in the City, doing a large continental business, has just sent a letter to all its foreign connexions suggesting that in future all polite comments on the goodness of the morning, and on the weather, should be eliminated from trunk telephone conversations. They had calculated that with a trunk telephone bill of £10,000 a quarter, "Good mornings" and inquiries after the health of other members of the firm cost them over £2,000 a year.

It frequently happened that the Hamburg or Rotterdam line would be used in succession by three members of the firm, and that each in turn would start his conversation by nearly a minute's comment on weather conditions. In these circumstances a little rain in Rotterdam was much too expensive.

The Copenhagen Telephone Company, says Reuter, has contracted with the Guaranty Trust Company of New York for a 25-years 5% loan of $7,000,000 (about £1,400,000).

The loan will be issued in New York in a few days' time at a price of 94¾%.

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The Odyssey of a Joke! In our issue of June last year we retailed a joke from a Glasgow paper, which had it from New York, about a Chicago telephone subscriber in New York complaining to a New Yorker of the telephone service and averring that in Chicago he could be put through quicker to H—l. "Yes," retorted the New Yorker, "but that's within the city limits!" The paragraph was copied in October by a Berlin paper, which evidently thought that H—l stood for an actual suburb of Chicago, and the joke was entirely lost in the translation. The translator represented the Chicago subscriber as saying that the call would have been completed much more quickly at home. "Yes," came the smart retort, "but that is only local service!" By February this year the German version of the joke had reached a telephone journal in Buenos Aires, which after making due acknowledgment to the *Glasgow Herald*, to the Journal, and to its German source, translated it into Spanish, still, of course, without any reference to the nether regions. Thus the joke which left New York early in 1928, travelling via Glasgow, London, and Berlin, finally returned to the New World in February 1929 in Spanish dress and minus its point!

A writer in the *Sheffield Weekly Telegraph* pretends that he overheard two telephonists chatting. Both were going to a party on the following Saturday, and they were discussing what they would wear. I listened to them for about ten minutes while they discussed their dresses, and, getting impatient, I tapped the receiver. "Are you there?" I cried. "Are you there? Hallo, hallo! Who is that speaking?" Then one of the girls addressed me. "What line do you think you're on?" she demanded indignantly. "I'm not exactly sure," I answered, "but, from all I've just heard, I think I must have got on the clothes line." This is really an embroidered version of an older story of a subscriber who gets a cross-connexion on a line over which two ladies are discussing dress. "What line do you think you are on?" asks one, angrily, as he bursts in. The rest is as above.

We have recently seen a copy of the *Post and Telegraph Review* of Manila. Amongst postal and telegraph matter are interspersed social and personal articles of an infinite variety, such as hints on what foods may be eaten with a spoon, on personal cleanliness, and on thrift. The Thrift campaign went so far as to embrace stamping on domestic letters: "Do not imitate the rich; live within your income." This ambiguous "slogan" seems to have caused some irritation to the rich of Manila, two of whom protested. After offering an apology the director of Posts states that "the thrift precepts in question were primarily intended for the poorer or laboring class and the younger generation," and that it was impossible to differentiate when stamping domestic mail matter. So we assume the rich are still being told by implication that they don't live within their income.

The principle of charging for each minute after the first 3 minutes at one-third of the 3-minute charge, instead of making the caller pay for a second 3-minute period, is being extended to the Inland Trunk Service on May 1. The new system, which will apply to all calls for distances of over 35 miles, is already familiar to users of the Anglo-Continental and Transatlantic Telephone Services in which it has been in force for over two years.

The caller will not, as heretofore, be specifically asked at the end of each 3-minute period if he wishes to extend the call. The operator will merely enter the circuit as nearly as possible at the end of the 3-minute periods and announce "3 minutes," "6 minutes," &c. The call will not be otherwise interrupted.

We have an enquiry from America for a bound set of volumes of the old *National Telephone Journal*. As we believe some of our readers possess such sets we shall be glad to hear if anyone wishes to dispose of them, and if so, at what price?

RHAPSODY

INSPIRED BY HEARING IN A VILLAGE INN A DISCUSSION AS TO THE PRONUNCIATION OF AN ENTRY IN THE LOCAL TELEPHONE DIRECTORY.

I. In the telephone book there are exquisite titles
That ring like the song of the heavenly Muses:
They enrapture the spirit, and nourish the vitals
With the influence rare that their melody oozes.
Now soft as the lute, and now loud as the organ,
Now majestic* and pure as the harp of the Jews is,
They would charm the Chimera, and soften the Gorgon,
And wean the poor Yank from wood-alcohol boozes.
But though they be lusciously rapture-compelling,
The phrase that Apollo for primacy chooses
Is the entry delicious, all others excelling,
Of Morgan and Mooney, the Misses, Massoozes.

II. Sweet balm for the spirit by trouble encumbered
The Ode to a Nightingale softly induces:
And happy the heart that has mused or has slumbered
To the sound of a rivulet lapping its sluices.
To the nose of the gourmet, how nobly enthralling
The stuffing enshrined in a Michaelmas goose is;
To maidens of Hellas, how magic the falling
Of dusk in the asphodel fields of Eleusis!
Hearts throb at the lilt of sea-chanties resounding
From China-bound clippers' romantic cabooses;
But nothing compares with the entry astounding
Of Morgan and Mooney, the Misses, Massooces.

III. But primordial slime, after all, is our Mother;
'Neath all our refinement we're children of hers.
The gibbering ape we must own as our brother;
We are kin to the maggot that loathlily stirs.
And thus among some a return atavistic
To the level of worm or of maggot occurs;
Their sense of the good and the rare and the mystic
Aboriginal mental opacity blurs.
So that e'en in the ranks of the true British gentry
You may find some abandoned and horrible curs
Who debase this ecstatic, this exquisite entry
To Morgan and Mooney, the Misses, Masseuses.

G.E.G.F.

* Poetic licence. The bard has neither heard nor seen this fabled instrument.

TEN YEARS AFTER.

THROUGHOUT the many years of silent vigil over London, "Old St. Paul's" has witnessed hundreds of human beings congregated on its steps below, sometimes in large crowds, sometimes in small meetings; but of all these gatherings none could be more exciting to those concerned than the one which took place on April 8, 1929.

It may interest readers to know the origin of this meeting: we therefore return in thought to the days of war. During that time a staff of ten telephonists and one Supervisor was loaned from Holborn Exchange to a P.B.X. attached to a temporary Government Office known as the International Commission, where, in spite of the dark days prevailing, three or four of the happiest years in the "Service" were spent together.

Then came Armistice, and with it the realisation that separation was inevitable; a suggestion was, however, put forward which resulted in the following agreement being drawn up and signed by all: "We the undersigned agree to meet on the steps of St. Paul's at 5.30 p.m. on April 8, 1929.

Signed April 8, 1919."

Is it to be wondered at, therefore, that the meeting referred to was exciting and happy! Not one "link in the chain" was missing, and it was with heartfelt thanks that one realised how marvellously all had been preserved during the ten years. After having a photograph taken as a memento the party proceeded to a restaurant for dinner, and at the end of a very happy evening of reminiscences a further agreement was signed, to meet, this time, in five years.

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THE AMERICAN TELEGRAPH SYSTEMS.

BY G. T. ARCHIBALD.

(*Continued from p.* 137.)

TRAINING in touch-typing and keyboard operating procedure occupies about three months. During the first three weeks a student is required to learn the five-unit code and to acquire familiarity with the keyboard layout. During this time a learner receives a greater amount of personal supervision than is given in this country. Various exercises have been compiled for practice purposes and for the encouragement of a good style of operating. All keyboard practice is gained on the type of machine which a learner will eventually be called upon to operate. The system of training is much more thorough than that in use in this country, and I may say that steps are being taken to see how far we can profit by our experience in America.

The qualifying standards are rigorously applied and no learner is employed on live traffic until he or she has been certified as fully competent.

A learner is also required to undergo, at least once a week during the period of training, a written examination consisting of ten questions on operating procedure. The Inspector discusses with the learner the points upon which incorrect answers have been furnished. At the end of the training period a final examination of 25 questions is set and a learner must earn 95% of the 100 marks obtainable.

After passing the qualifying tests a learner is assigned whenever possible to a busy circuit, preferably beside an experienced operator who is expected to render moral support and to see that the circuit is kept reasonably clear of traffic. A young operator is required to perforate for at least three hours a day until certified as a finished operator. For a time after a young operator has been assigned to a working point his or her work is inspected at intervals by an Instructor.

Operators attached to non-functional offices are trained in the maintenance and adjustment of teleprinters, and the maintenance by telegraphists, both male and female, is so satisfactory that a mechanic is not located at such offices.

I should perhaps make it clear that what I have to say on the American telegraph organisation from this point onward will refer more particularly to the Western Union Telegraph Co., except where otherwise stated.

Conditions of service in America differ radically from those in operation in Great Britain.

The usual hours of attendance are 48 hours per week. Meal reliefs are not provided in the company's time, but each employee (operating and non-operating) in the operating room is allowed two rest periods, each of 15 minutes, during the day; the total time worked is, therefore, 45 hours per week, as in Great Britain. Meal relief periods are scheduled on all duties and are recorded as "time off." All time taken over and above these reliefs is deducted from the operator's pay bill.

One week's annual leave with full pay is allowed to each employee with less than two years' service; two weeks' leave are granted after two years' service, and three weeks' after 30 years' service. Employees who can be spared are granted leave with full pay on what are known as legal holidays, corresponding to Bank Holidays in this country. Annual leave must be taken at the convenience of the company. Practically no leave is granted in the operating department during July and August. About 15% extra staff is provided at the larger offices for sick and annual leave and for other emergencies, including assistance to branch and other offices.

Hitherto annual leave has not been granted officially to employees of the Postal Telegraph-Cable Company. Many officers of the Company were permitted unofficially to take a holiday, and arrangements have now been made to come into line with the Western Union Company.

Double pay is given for work on Christmas Day and on legal holidays. As a rule Sunday work is paid for at the rate of time and a half but at a few small places, where telegraph business is conducted only during certain hours of the day, Sunday attendance is reckoned as part of the 48-hour week.

No telegraphist is guaranteed a full week's work, but those employed on a full duty receive full pay until due notice of reduced attendance has been given. The more senior members of the staff work full time all the year round, but in the slack season juniors may be required to work for only six or four hours a day, with a corresponding reduction of pay. When traffic is very light junior members of the staff may be placed on "furlough" without pay. It is usual, in such cases, for the persons concerned to be given two weeks' notice. Officers placed on leave without pay retain their seniority and any privileges during the period of enforced leave. No operator is placed on leave without pay, except at his own request, unless excess force cannot be reduced by short time attendances, and every effort is made to maintain full time working by temporary transfer before short time is introduced.

No monetary allowances are paid for the encouragement of technical study. The company will, however, advance as a loan the cost of technical correspondence courses—about $30—the money being refunded in monthly instalments.

Women are not obliged to resign on marriage and there is no marriage gratuity. Between 60 and 70% of the female staff are married women.

There is no free medical attendance.

As regards sick pay and pensions the Western Union Company created a fund with an initial appropriation of one million dollars which is maintained at that level provided that in no year the sum required exceeds 4% of the Company's pay roll. The fund is credited with interest at the rate of 4% per annum on the average monthly balance. It is administered by a Committee, appointed by the Board of Directors, which has very wide powers. All administration expenses are paid by the company and are not a charge on the fund.

Pensions may be granted to men and women after 20 years' service upon reaching 60 and 55 years of age respectively, at 55 and 50 respectively after 25 years' service, irrespective of age after 30 years' service, and irrespective of age on total disablement as a result of sickness or injury arising out of and in the course of employment by the company after 15 or more years' service. In the last case the pension is paid only during the period of disability.

Pensions are calculated at the rate of 1% of the average pay during the 10 years preceding retirement, or, at the discretion of the managing committee, upon the average pay of the 10 consecutive years during which the employee was paid the highest rate of wages. The minimum and maximum pensions granted for long service are $360 and $5,000 a year respectively. Pensions cease at death, but the committee is empowered to continue payment for a full month up to a maximum of 25 dollars to the relative or other person responsible for the pensioner's funeral expenses.

A number of men between 65 and 70 years of age are still working as morse operators, and it seemed to me that very few people could afford to retire on pension unless possessed of private means or alternative employment.

Sick pay is not so liberal as in this country. Supervising officers, who are expected to work additional hours without pay at any time, receive pay for sick leave from the first day.

Sick pay is allowed to telegraphists under the following regulations:—

(*a*) Under 2 years, no pay.
(*b*) 2-5 years' service, full pay 4 weeks, half pay 9 weeks.
(*c*) 5-10 „ „ „ „ 13 „ „ „ „ 13 „
(*d*) 10 „ „ or more, full pay 13 weeks, half pay 39 weeks.

No pay is given during the first seven days of sick leave.

The Postal Telegraph-Cable Company has a similar scheme.

I was told that sick leave in the Western Union Service averages about 12 days per annum, but no definite statistics are available.

Death benefits are paid in the case of accident on duty up to the equivalent of three years' wages with a maximum of $5,000. Similar benefits are paid in cases of death through sickness up to a maximum of one year's wages if of 10 years' service or more, six months' wages if of service of from 5 to 10 years. The maximum in this case is $2,000.

If in any year the fund is insufficient to meet all demands, and the company is not in a position to make an additional grant, the available funds are applied in the following order:—

1. To the payment of Pensions already granted.
2. „ „ „ granted during the year.
3. „ „ accident death benefits.
4. „ „ sickness death benefits.
5. „ „ other death benefits.
6. „ „ sickness disability benefits.

One of the most striking things about American telegraph organisation is the extent to which specialisation has been developed. Practically everybody is specialised, from the top to the messenger boy who delivers telegrams and he specialises on particular walks.

Classification of Staff.—The staff may be divided into six main groups: (1) Supervising, (2) Testing and Regulating, (3) Operating, (4) Circulating, (5) Collection and Distribution, (6) Clerical.

There are no standards of supervision. The requirements of each office are carefully studied and the amount of supervision depends largely upon the class and volume of the traffic to be handled and upon the topography of the building.

Supervising.—Control of a functional office is usually vested in a chief operator, who is responsible directly to the appropriate Division Traffic Superintendent.

At the larger offices an Assistant Chief Operator is placed in control of each type of apparatus, multiplex, teleprinter, morse and telephone; at smaller offices the duties are combined according to local circumstances. Each Assistant Chief Operator is responsible for the work of his division. He allocates to the Senior Supervisors, who correspond to Assistant Superintendents in the British Service, the force necessary to dispose of the traffic.

Senior Supervisors arrange the duties of the operating staff in the sections controlled by Supervisors, who correspond to Overseers in the British Service. The Supervisors are responsible for the movement of traffic, and are required to report immediately in any emergency, and hourly as to delay at each circuit, and the number of telegrams on hand. They must keep in close

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and constant contact with the traffic in order to see that no undue delay is allowed to accrue on fully paid class messages.

About 35% of the Supervisors are women.

The number of operators supervised by one sectional officer varies from 8 to 30. By reason of the heavy loads, the urgency of the traffic, and the quality of service, not more than three automatic circuits are contained in one section. Supervising officers are not responsible for the apparatus.

Under the control of the Chief Operator are the testing and regulating staff, the Automatic Chiefs and their assistants, and the maintenance staff.

Practically the whole of the testing and regulating staff is drawn from the operating force. Men who show adaptability and are known to take an interest in technical telegraphy are selected for this work. They are trained at the company's expense under qualified staff at working positions. No exceptional theoretical technical qualification is held to be necessary, but only telegraphists possessing a fair technical knowledge are considered eligible for promotion to this force.

Promotion.—Promotion to supervisory and technical duties is strictly by merit. Seniority is the deciding factor only where other qualifications are equal.

As a rule a supervising officer is drawn from the testing and regulating staff employed in the division in which he will be required to supervise.

During periods of seasonal pressure telegraphists may be required to act as Supervisors, but their pay is not necessarily increased during such periods. Similarly, during slack periods, Supervisors may be required to act as operators, and their pay during such periods is not necessarily reduced. In cases where there is a permanent reduction in traffic, a supervising officer may be reduced permanently to the grade of telegraphist.

An operator assigned to one type of circuit is rarely required to operate another. In a few cases, however, where complete specialisation would not be economical, a small number of operators may be required to work at multiplex and teleprinter circuits, but morse operators, unless specially trained, are not required to work at printing telegraph circuits.

About 67% of the operators are women. This proportion is increasing with the extension of the use of teleprinters.

The clerks employed on circulation work, or "routing," as it is called in America, attain a high degree of proficiency. They seldom qualify for positions as operators. Those who desire to do so may attend the telegraph school in their own time.

Rates of Pay.—It was somewhat difficult to obtain what may be regarded as a comprehensive view of salaries in America, and it may suffice if I give you brief details of the salaries paid at functional offices of the Western Union Company, where the grades compare more or less closely with those employed in the British telegraph service.

There are no definite scales of pay, and salaries vary according to the volume of traffic and the cost of living in particular localities. Operators are paid according to the type of circuit at which they are employed, the highest rate being paid in all cases to those operators employed at circuits carrying the heaviest loads.

Staffs employed between 6 p.m. and 6 a.m. receive "differential" pay amounting to 15% on salaries up to $130 a month and 10% on salaries between $130 and $200 a month.

In the Western Union Company salaries are reviewed twice a year by an advisory board, consisting of the Assistant Chief Operators and one, or at most two, members of the local Staff Association. The Board's recommendations are not necessarily accepted by the Chief Operator. In the event of disagreement the person concerned may appeal to the Chief Operator through the local association officials, and the appeal may be carried through successive stages, i.e., the Division Association officials to Division Traffic Superintendent, President of the Association to Vice-President of the department concerned, and finally to the President of the company, whose decision is final.

Every employee of the company is eligible to share in an Income Participation Scheme. This profit-sharing scheme, adopted as a means for encouraging the staff to co-operate in the reduction of costs, is an interesting development. After deducting a certain amount to meet dividends, &c., the remaining profits of the company are divided into two parts, one is distributed to the shareholders, the other to the staff. All regular employees, including messengers, participate in the distribution, which last year was equal to about 4% of their pay. It is expected that a much greater sum will be available for distribution this year.

Duties are divided into three "tours":—

Day	... ...	8 a.m. to 4 p.m.
Early night	...	4 p.m. to 12 midnight.
Late night	...	12 midnight to 8 a.m.

Only about 10% of the staff, and these the more junior, rotate. The period of rotation depends upon local conditions: in New York it is usually two consecutive months on each tour.

The non-rotating members of the staff perform the same hours of duty continuously whilst employed on any particular tour; the more convenient duties being allotted to the officers best qualified for the particular work.

A standard chart for each tour, based on traffic load abstracts obtained for the circuit numbering sheets, is prepared twice annually. The chart is amended from time to time as circumstances demand. The staffing arrangements are so simple that no force is employed on work in connexion with duties. One cannot help feeling a certain amount of sympathy with those who are compelled to work the less favourable duties, but of course they receive the additional pay already referred to for working after 6 p.m. The officials of the company think that regular hours of attendance are better both for the operators and the company. Exchanges of duty are allowed without limit between officers of similar ability working the same type of apparatus.

Each operator is provided daily with a time card bearing his name and hours of attendance: these particulars are recorded by means of an addressograph machine at the larger offices and by typewriter at the smaller offices.

The cards are kept in a rack at a convenient point in each division. On taking up duty the operator selects his card, records the section code and time of arrival by means of a Stromberg Timing stamp and returns his card to the rack. After recording "off" duty at the close of the day attendance cards are dropped into a locked box from which they are collected next day by a clerical officer and checked for pay purposes. Rest reliefs and the meal relief are recorded on the reverse side of the card.

An operator working in more than one division during his period of duty is required to clock on and "off" in each division in order that his time may be charged to the proper type of apparatus, &c.

Records of overtime must be certified by the officer in charge of the section in which it is performed.

Great care is taken to see that correct records are available and any person guilty of wilful tampering with an attendance card is liable to instant dismissal.

Discipline.—Frequent late attendance is penalised in one of several ways. Unpunctuality is, of course, taken into account when the salary of an officer is under review, and may jeopardise an increase of pay.

Persistent unpunctuality is sometimes met by loss of a favourable duty, sometimes by suspension for from one to three days without pay, and, in the last resort, by dismissal.

An operator responsible for an error warranting more severe punishment than a reprimand and a note on his or her record (which is considered when the salary is under review) may be suspended—usually for three days—or dismissed. The companies are liable for damages due to errors up to a maximum of $500.

Operating Procedure.—Supervising officers are responsible for the distribution of telegrams to the various channels on a multi-channel route.

A serial numbering form is used at each channel on all types of apparatus. The operator enters his personal signal—not necessarily his initials—and the time opposite the first and last number dealt with during his period at the circuit. It is not necessary, therefore, for the operator to write his name or sign on the telegram form at either the sending or receiving stage. This saves time.

Operators at duplex morse circuits receive and send for periods of from one to four hours alternately, according to the load at the circuit. Operators at multiplex and teleprinter duplex circuits work alternately two hours as perforator operators and two hours as printer operators. Operators are required to make these changes with as little delay as possible and it was obvious that no time is lost during the change over.

No telegrams are handwritten. At Morse circuits the receiving operator is required to feed a typewriter machine with double forms and a carbonic for each telegram.

Not more than one message may be placed on the sending lectern at a time at a multiplex or teleprinter circuit and each telegram must be timed and placed in the "sent" receptacle before the succeeding message is serially numbered. Tape must not be prepared at a speed which will enable the operator to be more than one message ahead of the transmitter, and in order that the attention of the Supervisor may readily be drawn to the non-observance of this rule, the "slack tape" holes in the tables have been filled in. This regulation has the effect of facilitating the disposal of corrections, &c.

Telegrams exceeding 60 words in length are prefixed by the word "LONG" in order that receiving operators may gum up the slip in a proper manner.

Corrections and reperforations take precedence over all new traffic except "X" traffic, and are dealt with as soon as the tape in process of preparation is completed.

Omitted serial numbers must be reported immediately to the Supervising Officer, but this does not relieve the operator of the necessity for seeing that the number is properly accounted for within a reasonable length of time.

All received telegrams must be prepared in a neat, orderly, legible manner, and in no circumstances is a bad copy allowed to reach the public. Receiving operators are required to use the official moistening apparatus and slip cutter.

An operator may not leave his working position without the permission of his immediate supervising officer. Before leaving a working position, an operator is required to explain to his relief the work in hand so that he may readily assume charge of the position without danger of failure, delay, error or interruption.

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External Plant.—I do not propose to say very much about external plant, but the following details may be of interest. In 1927 the Western Union Company owned 214,799 miles of pole route, carrying 1,747,453 miles of wire and 3,419 miles of underground cable. The Postal Telegraph Company then owned 32,355 miles of pole route, carrying 315,176 miles of wire and 7,551 miles of aerial cable and 31,011 miles of underground cable. The reason for this company's larger cable wire mileage is that it has been compelled to take to the roads. Western Union lines, on the other hand, are carried mainly along railway routes in the company's own maintenance. Various right of way contracts between the company and the railways are in operation, in some cases free wires are provided for train despatching and in others railway telegrams are sent free of charge, &c. In certain areas lines belonging to both companies are erected on poles in Western Union maintenance, the Postal Telegraph Company bearing its share of maintenance costs.

Chestnut poles treated for only a few feet of their length are used to a considerable extent. A new preservative agent capable of greatly increasing the life of poles has recently been invented by an American telegraph engineer. Glass insulators costing about half as much as porcelain are also in general use.

Specially equipped trains are provided for Western Union construction gangs who work over long distances. The men are provided with sleeping accommodation, recreation room and dining room, and there is a small office, complete with typewriter, for the foreman. Each train carries a cook and attendants and all meals are taken on board. The men receive their food in part payment of wages. We were invited to take lunch on this train; the food was plain but of good quality. I rather envied the man with an appetite equal to the enormous helping of food placed before me. Cards and other games are provided at the company's expense.

So far not much use has been made of phantom circuits but both companies have recently concluded important agreements with the American Telephone and Telegraph Company for the use of composited and other phantom circuits. Mr. Carlton, the President of the Western Union Company, is looking forward to the time, thought by many people in America to be not very far distant, when all telegraph circuits will be operated over phantom circuits. This, Mr. Carlton thinks, and rightly, will expedite the cheapening of transmission costs.

Circulation.—The system of circulation or routing resembles that in operation in Great Britain. All the Western Union Company's lines run along the main railway routes and the traffic is circulated by the most direct geographical route consistent with wire conditions.

In a few cases large branch offices serving particular industries are provided with direct communication with the centre of the industry concerned, *e.g.*, Cable Office, New York, works direct with the cities dealing with heavy cable traffic, the Fish Market Office at New York works direct to the Fish Market Office at Boston, &c.

Similar arrangements are in operation in the Postal Telegraph system.

Instrument Layout.—The offices of the Western Union Company at New York, Philadelphia, Washington and Chicago are very well equipped and arranged. Everything is done to reduce handlings to a minimum and to facilitate the transfer of traffic from one point to another, and generous use is made of labour-saving devices.

Whenever possible the whole of the apparatus is located on a single floor, but at the largest offices in New York, Chicago, Philadelphia, &c., this arrangement is not practicable owing to the extensive equipment required to deal with the traffic. In New York, for instance, the present office occupies eight floors of a building belonging to the American Telephone and Telegraph Company.

It is the practice to arrange all apparatus of the same type in one division.

Double tables with belt conveyors feeding into a common conveyor connected with the main circulation table are standard at all large offices, and outgoing traffic is also carried by conveyors to convenient drop points on the various floors and sectional areas from whence it is circulated by hand to the appropriate circuits.

The keyboard operator's chair consists of seamless steel tubing cut and bent to suitable prescribed dimensions and details. The lower extremities of the frame are fitted into four metal steel sockets to which the castors are fixed. The back frame consists of a tempered steel rod capable of withstanding pressure applied to the back rest which is bolted to a strip fixed to the upper extremity of the rod. Both the back rest and chair seat are padded. The seat is fixed, but the chair is capable of being fitted with castors to enable operators at simplex circuits to move easily from the sending to the receiving position, and *vice versa*.

Table belts convey the telegrams to inclined belts, these in turn transfer them to an overhead belt running at right angles to the tables leading either by means of chutes or other conveyors to a general distribution table. The belts travel in open troughs of sheet-iron which prevent the messages from slipping off. The telegrams pass along the circulation table on a slow-moving belt but before reaching the circulating positions the forms are faced by girls (routing aides) in order to facilitate their treatment by the circulators. Each circulator takes traffic from the belt for sortation and any telegram which passes the last position is collected by a supervisor and distributed to the circulators by hand.

Any telegram which cannot be circulated without reference is passed to a routing aide, who traces the destination by means of a leaf index like the "Bizada" and indicates on the form the proper circulation.

The telegrams are sorted direct to travelling belts, arranged immediately in front of the circulators, which serve drop points in the various sections. Distribution from drop points to the circuits is performed by routing aides who dash about in tireless fashion. At Chicago a number of young people are provided with roller skates to facilitate circulation of "class" traffic. The gangways in the present New York office are not suitable for this form of locomotion, but I believe it will be adopted when the new office is available in 1930.

Internal Apparatus.—As I pointed out earlier on, the Western Union Telegraph Company were pioneers in the use of machine telegraphy and they have ever been on the look-out for a good and reliable system. Until quite recently, however, the Postal Telegraph Company depended entirely on morse, but it is now making rapid strides in the development of machine apparatus and at the present time it is little behind its rival so far as methods are concerned.

In the Western Union system morse sounders and in some cases telephones are being replaced rapidly by teleprinters. The use of teleprinter circuits on branch office circuits carrying a moderate load is enabling the company to combine clerical and operating work.

Triple and double automatic multiplex circuits working at speeds of from 48 to 60 words per minute, with tape printing receivers, are installed on all the principal and heavily-loaded routes of both companies. The view is held that it is better and more economical to work a small number of channels at a speed consistent with a high degree of stability and approximating to the capacity of the expert operator than to work a larger number of channels at a relatively low speed. The Baudot method of phase correction is used, but the correction impulses are generated by the actual working signals.

On the more important circuits in the Western Union System separate distributors, independently driven, are used for sending and receiving. The breakdown of one distributor does not disturb the working in the opposite direction and this in itself is an important consideration.

On circuits fitted with single distributor sets each office acts as "correcting" station in alternate weeks.

In the Postal Telegraph system practically all multiplex circuits are double duplex working at speeds of from 50 to 60 words per minute and the distributors are of the cam contact type, driven by D.C. motors, the speed of which is controlled by a vibrating fork. Electrical correction is employed, the speed of the vibrating forks being corrected by the correction impulses generated by the working signals. In this system too, synchronising apparatus is segregated but the question of reverting to the old arrangement is under consideration.

Three station or divided multiplex circuits are extensively used by both companies.

As many as 12 repeaters are required on the long east-to-west circuits. In cases where the cumulative distortion of signals due to long-line sections and ordinary repeaters would render it difficult to maintain a satisfactory speed of working, regenerative repeaters are installed at distances about 500 miles apart. These repeaters not only strengthen the signalling current in the next line section but correct distortion and maintain perfect signals.

Western Electric transmitters and automatic control units are used and the Morkrum keyboard perforator, which is simple in mechanical construction and easily and cheaply maintained, is preferred to all others.

Experience has proved to the Western Union Company that the maintenance of page printers costs nearly three times that of tape printers, and the type bar printer made by the Morkrum-Kleinschmidt Company is in general use on the company's multiplex circuits. The experience of the Postal Telegraph Company is similar and they intend sooner or later to abandon page printing.

Extensive use is made of start-stop apparatus, especially in the Western Union Company's system. What we know as the Morkrum 2A is standard.

When duplex conditions are warranted a teletype 2A is used for sending and for printing a home record and a separate printer unit is used for reception. The company is now considering the possibility of dispensing with the home record.

All multiplex and teleprinter sets are mounted on specially wired tables equipped with automatic time stamps, numbering machines and gumming desks of standard pattern.

Teleprinter concentrators accommodating four to six circuits are widely used, but so far neither company is satisfied, and both contemplate the use of units accommodating a larger number of circuits.

Morse.—Morse is a back number in America. The vibroplex key and typewriter reception are used universally. The operators provide their own keys, which are maintained by the companies. At one time the operators provided their own machines: they are now provided by the companies.

Reference should perhaps be made to the use of a device known as the Gill selector used at concentrators for the purpose of enabling one office to call another office on the same line without producing a signal at the concentrator. The attention of the concentrator office is gained by the use of a definite calling signal which operates the Gill selector at that office and lights the signal lamp.

(To be continued.)

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SERVICE INSPECTION AND THE CALLING RATE.

BY R. S. GROSVENOR, GLOUCESTER.

THE duties of an officer engaged on Service Inspection are varied and call for considerable tact, patience, strict accuracy, a true perspective and a cheerful manner. He is required to interview all classes of subscribers, in all kinds of places and all kinds of moods, from those who will discuss and eulogise or disparage the service at length to the subscriber in a small way of business who is very suspicious of the procedure and flatly declines to make any calls for the purpose of a test, at the same time stating: "The service is quite satisfactory. Thank you!"

An article on the experiences of a Service Inspector would be interesting. It is hoped that one may be forthcoming. The Service Inspector is a liaison officer between the service and its subscribers. While testing the quality of the service generally is the primary function of the duty, opportunity is taken whenever possible to draw attention to the lesser-known facilities of the service, e.g., fixed time trunk calls, despatching and receiving telegrams, express and ordinary letters, night telegraph letters, &c.

Much more than this, however, can be done. An officer engaged on this duty has an exceptional opportunity to do his bit—in fact, an appreciable piece—in stimulating the calling rate. Oh, yes! it is easy enough to say this, and quite another matter to carry it out. The object in view, however, is vital to the interests of the service and calls for energetic action.

Now to consider the ways of achieving this object. There are many. The great majority of subscribers visited express satisfaction with the service. An atmosphere can be frequently created to allow the question of use to be introduced. If subscribers can be induced to make on an average one more call each per day, what a difference the operating statistical records will show. New subscribers should *always* be carefully approached as to use and the many advantages and facilities of the service pointed out according to the position or business of the person or firm visited.

When visiting subscribers connected to small or rural exchanges, the relative trunk and junction facilities should be well known, in order that any question arising can be fully dealt with. Any extension or authorised extension of such facilities should be carefully explained and increased use thus encouraged. Subscribers should be reminded of the variation in the rates during the day 7 a.m. to 2 p.m., 2 p.m. to 7 p.m. and 7 p.m. to 7 a.m.—and further, that delay is generally very much less during the periods from 2 p.m. onwards. Where opportunity occurs attention should be directed to the reduced fees for prolonged use of Trunk circuits. A Service Inspector should be a *missionary* as well as an *emissary*, ever spreading the great value of the word spoken by telephone, emphasising the fact that a reply is obtained frequently resulting in the successful completion of an important business or social matter. The International Services should not be overlooked.

Again, subscribers should be tactfully invited to read the preface of the Telephone Directory, which it is safe to say a very large number do not. This leads to an important point in an inverse direction.

A Service Inspector is *in a unique position to ascertain why individual subscribers do not make more use of the Telephone.*

Frequently this is obvious after a few minutes' conversation, when the subscriber becomes red in the face and commences to use certain words that are not in the Telephone Directory. The importance of recording and following up complaints, even those whose face value seem trivial, cannot be over-estimated. Firm assurance should be given that any complaint will be fully investigated and the matter not allowed to be closed until satisfaction is expressed. *Subscribers with a grievance are discouraged users*, and very careful attention is called for in order to give renewed confidence. No doubt many potential calls are lost in this manner, and it is essential that such loss should be minimised as far as possible.

It is the small matters that count and often cause a subscriber to say "Oh! never mind, I will run over and see so-and-so, instead of using the telephone."

An opportunity of obtaining particulars with any helpful details regarding prospective subscribers should be sought and the information speedily passed on to the appropriate quarter.

A Service Inspector is also frequently approached regarding additional facilities, e.g., residential connexions, auxiliary lines, extension circuits, &c. Enquiries of this nature should, of course, be encouraged, and under fitting circumstances such facilities suggested.

Additions to existing installations are not only good business but leads to increased use.

A further important aspect of this duty is the assistance and advice that can be given. Experience shows that subscribers always welcome useful information and advice on telephone matters. It has to be kept well in mind that a subscriber is generally quite unaware of what is entailed to establish a connexion. Operating procedure is more or less unknown to the individual subscriber. The result of a simple explanation generally means a more satisfied user, with consequent increased confidence in the service.

It is somewhat remarkable that a large proportion of subscribers—many of long standing—are still unaware of the correct method of carrying out their part in the promotion of a quick and efficient service.

Subscribers often refrain from making calls to a specific number or numbers because difficulty has arisen in the past with such particular calls. The necessity of drawing the attention of the operator to difficulty during the progress of a call or of asking for the Supervisor and reporting any trouble experienced immediately it occurs, cannot be too firmly impressed.

The telephone habit can be greatly encouraged by educating users in the value and economy the service affords to both the business and private life of the country. To use the telephone in preference to a slower means of communication is sound advice. A really efficient and consistently developing telephone service is available to the public. Efficiency is the Department's motto. Telephone plant, both internal and external, of the very best calibre is being used. Automatic systems in which the most up-to-date plant and devices known to the telephone world are being gradually introduced to improve the service generally and provide for development. While an excellent telephone service is available in this country, the slogan, "The country at your elbow," is rapidly becoming inadequate. It will very shortly be "The world at your elbow."

Tremendous progress has been made in the comparatively short life of the Telephone Service—what a difference between a mere 40 years ago and to-day.

All these facts should be kept well in the mind of a Service Inspector when calling upon subscribers—*the Department's customers*. As an accredited representative of a truly worthy service, the Service Inspector in his official capacity has a splendid opportunity of advertising our wares, and in so doing help and educate our subscribers to understand, realise and appreciate the value of the Telephone Call. We are proud of our service. Certainly! Very well, talk about it "good and plenty." Subscribers generally are not taking anything like the advantage of the service that should be the case, and our main object, by every means in our power, is to induce them to do so.

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PROGRESS OF THE TELEPHONE SYSTEM.

THE total number of telephone stations working at Feb. 28, 1929, was 1,742,095, representing an increase of 11,313 on the total at the end of the previous month.

The growth for the month is summarised below :—

	London.	*Provinces.*
Telephone Stations—		
Total at Feb. 28	621,970	1,120,125
Net increase for month	4,400	6,913
Residence Rate Subscribers—		
Total	148,274	234,107
Net increase	1,631	2,299
Call Office Stations (including Kiosks)—		
Total	5,569	20,198
Net increase	33	90
Kiosks—		
Total	1,260	4,960
Net increase	15	63
Rural Party Line Stations—		
Total	—	10,412
Net increase	—	35
Rural Railway Stations connected with Exchange System—		
Total	17	1,074
Net increase	—	39

The total number of inland trunk calls dealt with during January, 1929 (the latest statistics available) was 9,318,168, representing an increase of 962,300, or 11.5% on the figure for the corresponding month of the previous year. Outgoing international calls in January numbered 42,940, and incoming international calls 45,233, representing increases of 12,270 (40.0%) and 13,416 (42.2%) respectively over January, 1928.

Further progress was made during the month of March with the development of the local exchange system. New exchanges opened included the following :—

LONDON—Archway (automatic), Temple Bar (automatic), Emberbrook, Flaxman, Hillside, Metropolitan, National.

PROVINCES—Elsham (rural automatic), Linthorpe (automatic), Middlesbrough (automatic), North Stainley (rural automatic) South Bank (automatic), Stockton (automatic).

And among the more important exchanges extended were :—

LONDON—Hounslow.

PROVINCES—Cambridge, Egham, Godalming, Greenock, Hamilton, Malone, Reading, Stoke Bishop, Wellingborough, Westbury-on-Trym.

During the month the following addition to the main underground system was completed and brought into use :—

Birmingham—Nuneaton,

while 72 new overhead trunk circuits were completed, and 82 additional circuits were provided by means of spare wires in underground cables.

C.T.O. NOTES.

(1) *Bowls.*—The C.T.O. Bowling Club, which was founded in 1922, has arranged to play eleven matches on the green of the Civil Service Bowling Association at Chiswick during the 1929 Season, six with Post Office Bowling Clubs, A.G.D., L.P.S., L.T.S., S.B.D., Paddington District and Engineering Department, and five with Clubs connected with other Government Offices, Admiralty, Inland Revenue, Ministry of Transport, Customs and Excise and Civil Service Headquarters.

(2) *Chess Club.*—The Centels Chess Club have just completed another successful season—the sixth of its career. The first team was No. 2 in the third division of the Civil Service League with 8½ points out of a possible 11, and No. 3 in the London League "C." The second team, which has received welcome recruits from the youth of the Office, won 7, drew 2, and lost 4 games. The local championship together with the "Laxton" Cup was won by Mr. D. J. Charlton. The President's prize for the best score in the first team was won by Mr. J. Fennell with 12½ points out of 18. Mr. J. P. Morgan who has played top board won 5, drew 7, and lost 3. Mr. F. Lobb headed the second team with 9 points out of 10.

(3) *Football.*—The C.T.O. Messengers have this winter won both the Shield of the Junior Post Office Football League and the Cup.

(4) *Retirements.*—Clerical Officer—Mr. E. J. WEBBER. Superintendents—Messrs. E. M. DIAPER and H. E. CULLUM. Assistant Superintendents—Messrs. E. R. JAMES and A. J. R. ROWLANDS. Overseers—Messrs. E. J. BURCKHARDT, J. G. SMITH, and E. A. ROBINSON. Telegraphists—Messrs. C. G. SIMMONS, J. WRIGHT, and D. SUTHERLAND. Supervisor—Miss A. E. Hickson. Assistant Supervisors—Miss F. M. COOKE and Miss M. E. DAVIES. Telegraphists (Female)—Miss R. SAMUEL and Mrs. E. D. LYLE.

(5) *Promotions.*—Mr. J. H. G. CLIFTON, Assistant Superintendent to Superintendent. Messrs. C. B. FRANKLIN, H. A. SONGHURST, and D. D. EVANS, Overseers to Assistant Superintendents.

(6) *Obituary.*—We regret to record the death of Mr. W. J. Walton and Mr. H. Davis. The former was on the Night Staff and the latter attached to the "D" Division.

LONDON ENGINEERING NOTES.

Exchange Construction.

The following automatic exchanges were opened during March :—

Temple Bar (Russell Street, W.C.2).
Archway (Pine Grove, Tollington Park).

The following particulars of automatic exchanges already opened in the London area may be of interest :—

Name.	*No. of Equipped Lines.*	*Date Opened.*	*Manufacturer.*
Tandem	—	Aug. 8, 1927	A.T.M.
Holborn	9,400	Nov. 12, 1927	,,
Bishopsgate ...	8,000	Mar. 4, 1928	,,
Sloane	8,400	July 28, 1928	Standards.
Bermondsey ...	2,600	Sept. 1, 1928	,,
Monument	9,450	Nov. 3, 1928	A.T.M.
Welbeck	8,700	Dec. 1, 1928	Standards.
Western	7,100	Jan. 5, 1928	Siemens.
Temple Bar ...	7,700	Mar. 2, 1929	Standards.
Archway	3,100	Mar. 9, 1929	General Electric Co.

The following Automatic Exchanges will be opened during the next few months :—

	No. of Equipped Lines.	*Manufacturer.*
Beckenham	3,000	Siemens.
Reliance	2,700	General Electric Co.
Maida Vale	7,500	Siemens.
Edgware	1,300	General Electric Co.
Metropolitan	9,500	A.T.M.
National	9,500	,,
Fulham	7,500	Standards.
Flaxman (Kensington) ...	9,900	General Electric Co.
Mitcham	1,480	Siemens.
Hendon	4,200	A.T.M.

Promotions.

Mr. E. GOMERSALL to be Superintending Engineer of the London Engineering District *vice* Mr. McIlroy.

An account of Mr. Gomersall's career has already appeared in this *Journal*. It may be stated here that Mr. Gomersall brings to his task a wide and unique experience which will still further enhance the prestige of the London Engineering District.

Mr. CORNISH to be Deputy Superintending Engineer *vice* Mr. E. Gomersall.

Mr. Cornish commenced his career as a pupil with the City of Bath Electric Light Company and later entered the service of the Swansea Harbour Trust as a Power Engineer with the late Mr. Augustus Schenck. Subsequently Sir William Preece obtained his services for the Engineering Department of the Post Office which he entered in 1893 and was stationed at Birmingham as Power Engineer.

In 1906 Mr. Cornish was promoted to be First Class Engineer at Birmingham, and in that capacity performed the varied duties connected with Power Telegraph and Telephone Engineering, which then, as now, fall to the lot of a Provincial Sectional Engineer.

Shortly afterwards he was transferred to London with Headquarters at Mount Pleasant. Whilst there he was in charge of the Generating Station, Miscellaneous Power Plant, and the Power Test Room. Later he was engaged in the Test Section on Cable and Miscellaneous testing work under the late Mr. Hartnell.

In 1908 he was transferred to the Power Section and was engaged on work connected with the provision of the new Power Stations and Sub-stations, and also the equipment of the new King Edward Building. In 1909 he was promoted to be Assistant Superintending Engineer in the London Power District, and in 1912 was again transferred to the Power Section in the Engineer-in-Chief's Office and was engaged on work in connexion with Post Office Tube Railway, Imperial Wireless Scheme, and developments in connexion with a Central Power Scheme.

Mr. Cornish now becomes Deputy Superintending Engineer, and in that capacity has received the congratulations and retains the good wishes of all those who know him. He combines a wide practical experience based upon sound technical training with a cultured outlook.

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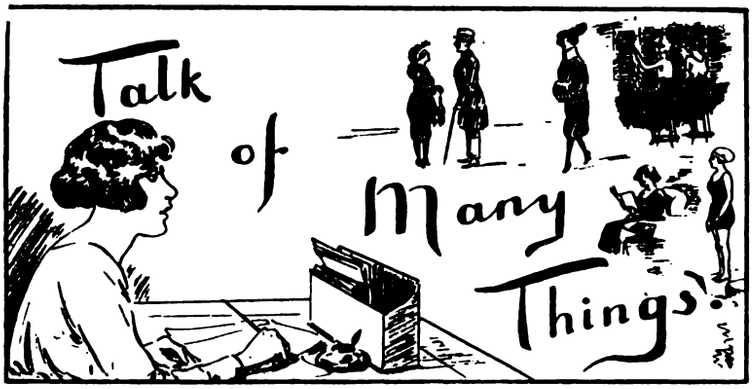
WE TELEPHONISTS



Talkies.

KNOWING how keen you are on statistics—for do you not meet together early in the morning to ponder upon them—I thought you might like to know that, during the year ended Mar. 31, 1929, over six hundred million calls were originated in London. Far be it from us, who live by word of mouth and who know that speech is golden and that silence does not give content—far be it from us, I say, to do anything to discourage people from talking. But between ourselves, don't you really think that something ought to be done about it? Isn't it awful that people should talk so much—chattering away from roseate morn till dewy eve and oft in the chilly night, every day including Sundays, Good Fridays, Christmas Days and Bank Holidays, with scarce a break? Fancy 12-and-eight-noughts people, all talking—what a row! Of course, I know that some of the calls are ineffective, but since they give rise to far more language than effective calls, the net result is the same. Words, words—countless in number, infinitely varied in combination, expression and meaning—Heavens, what a flood!

Undoubtedly, we talk more than our forefathers. The day is no longer now than then, and I suppose we don't talk any faster, so that we must have a much smaller amount of time available for thinking. We even wag our tongues in these days to save our legs—I do not mean to suggest, of course, that our eminently respectable forbears waved their legs to express their thoughts. But the talking habit is increasing, not merely in relation to telephones. We have put up wires and installed boxes of tricks to collect speech from the ether, and loud-speakers blare at us from the four corners of the earth. Now, however, the last straw has dawned above the horizon. It flickered feebly at first, then, winging its path with stealthy tread, it began eating into the optical silence and finally, its hot breath beating upon our startled senses, it is tightening its icy grip upon us with a nasal twang. The movies are turning into talkies. No longer shall we be able to slip into speechless vision, lulled by sweet music and soft lights. The oriental appeal is to be marred by the occidental squeal and the tender kiss of the strong silent hero of the film will lose its thrill in audibility.

Where now shall we turn in those moments when all speech is boredom and when we crave only for quietude? Well, there are always the mountains—the Ararats above the flood. Their grandeur compels silence. You can't talk much when you're climbing, and, if you do, the wind hurls the words into space. Listen, and you will hear sounds far sweeter than speech. The trees give you "Good-day and God-speed" as you pass, and when you look down upon them they seem to be waving you upward. When you fling yourself down to rest the grass whispers and the refreshing spring sends back a gurgle of pure laughter. As you press forward the rocks ring to your tread and the loose stones leap downwards with a joyous abandon. And then you reach the summit. Far below men are creeping slowly like beetles along the winding ribbon of road, and they are still chattering—chattering of Heaven knows what. But on the summit there is such a sense of remoteness—such a vista of beauty that speech is sacrilege. The only drawback is that you might meet

PERCY FLAGE.

Sydenham Exchange.

A Tea and Entertainment was given to 200 poor children of the Penge and Sydenham Districts by the staff of the Sydenham Exchange on Saturday, Mar. 9.

After tea, which was consumed with great zest, the children settled down to the entertainment. They were invited to join in the songs and choruses, and judging by the lusty yells which emanated from small throats, thoroughly enjoyed this part of the programme.

The activities of a theatrical horse, which was manipulated by two engineers, caused great excitement. It danced, sang, performed numerous tricks, and gave the kiddies rides round the hall, giving great delight.

On leaving, each child was the recipient of a bag containing fruit, sweets and a toy.

It is gratifying to know that it was a success as everyone (including engineers) worked hard to achieve this end.

H. R.

Tommy Beck.

You have gone—and we are left,
Tommy Beck.
Of your smiling face bereft,
Tommy Beck.
Never more as Sun God gay,
Or Commissionaire O.K.,
Shall we see you in our Play,
Tommy Beck.

Never more—ah, sad and strange—
Tommy Beck,
Will you brighten the exchange,
Tommy Beck.
And with greeting debonair
Clear the thunder from the air
Which is *sometimes* gathered there,
Tommy Beck.

But we think you really ought,
Tommy Beck,
Now and then to spare a thought,
Tommy Beck,
For your colleagues left behind
To the turmoil and the grind—
Oh, we'll think it more than kind,
Tommy Beck.

And when you fresh heights have scaled,
Tommy Beck,
And your newer joys have paled,
Tommy Beck,
Bright as sunshine after rain,
Bringing solace for our pain,
Will ye no' come back again,
Tommy Beck!

A Lament.

Oh, May-day! Oh, May-day!
You follow after Pay-day.
But what a tragedy it is,
When you turn out a grey day!

Herald of the merry month,
When ev'ry day's a play-day!
We expect that May the "Wun "th
Will be a bright and gay day!

Especially since we are, 'tis plain,
No longer in our hey-day—
Ah! this would make us young again
A real old-fashioned May-day.

C. A. S.

Contributions to this column should be addressed: THE EDITRESS, "Talk of Many Things," *Telegraph and Telephone Journal*, Secretary's Office, G.P.O. (North), London, E.C.1.

GLOUCESTER NOTES.

AT a well-attended meeting of the Cheltenham Chamber of Commerce, held on Mar. 12, a paper on "The Cheltenham Automatic Telephone System from a Traffic Point of View," was read by Mr. R. S. Grosvenor, Traffic Superintendent, Gloucester. Some 50 or more members of the Chamber were present and each was supplied with a simple diagram showing the system of switching. A demonstration set was utilised to illustrate the outstanding features of the system.

The object of the paper was to increase the interest of the members in the telephone service and thus to stimulate the use of that service. To this end, special attention was called to the comparatively low calling rate at Cheltenham. The paper was given a good reception and in the course of a somewhat prolonged discussion which followed, it was apparent that interest had been aroused to the many advantages to be derived from greater and more consistent use of the service.

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LONDON TELEPHONE SERVICE NOTES.

Contract Branch Notes.

THE business done by the Contract Branch during the month of March resulted in a net gain of 3,190 stations, as compared with 4,356 stations last year.

Business during March was very unsatisfactory, and in spite of strenuous efforts and repeated doses of "ginger" the figures failed to reach the 1928 figure. Search for the cause of the slump has revealed an accumulation of adverse circumstances each of which must bear its part of the blame for the poor results obtained. Among the adverse items may be mentioned the early Easter reducing the number of working days, the absence of the Court from London, Budget doubts and fears, the General Election, the high Bank Rate, &c., &c.

The enquiry has revealed, too, what a grip the "payment by instalment" system has got upon the present generation. Houses, furniture, motor cars and even clothes are purchased on this basis, and so many possible subscribers say they cannot at the moment afford telephone service but as soon as the house or the motor car or what not is paid off, they will have the service. A monthly rate would help here!

There were 365 exhibitors at the Ideal Home Exhibition, and orders were obtained for exchange lines from 151 of them. Last year there were 424 exhibitors who produced orders for 152 lines.

This year a "Printing" Exhibition was held at Olympia—quite a new one—and orders for 133 lines were obtained from 230 subscribers.

A new type of concrete kiosk (known as No. 3), specially designed for the Department by Sir Gilbert Scott, R.A., has been adopted for general use in urban districts. The window frames and the beading which surrounds them are painted red; the tint of the concrete walls and door resembles Portland stone but is rather warmer. There are glass signs embodied in the opening at the top on each side with the word "Telephone" in maroon letters on a cream ground.

An emergency device has been introduced for use in connexion with fire, ambulance, or police calls from multi-coin boxes connected to manual exchanges. By pressing a button and without having to insert coins in the coin-box, the caller gives a flashing signal to the exchange which will receive priority over other calls. The device is not required in multi-coin box call offices connected to automatic exchanges because the caller can dial "O" and obtain the attention of an operator without the insertion of coins.

* * * *

Obituary.

We regret to announce the death of Mr. A. W. Eames, Contract Officer, Class II, of the South-East District Contract Office. Mr. Eames always suffered from poor health but carried on in a brave manner. He was a very kind and good-hearted man, and his passing is deeply deplored by all who knew him.

Mr. Eames, who belonged to what we may call a Post Office family, commenced his career with the National Telephone Co. and spent most of his service with the South-East District Contract Office.

The sympathy of all of the staff is extended to Mrs. Eames and her two sons in the time of their bereavement.

The funeral, which took place at Honor Oak Cemetery, was attended by representatives of the Office.

The London Telephone Service was deprived of the services of one of its senior Traffic Officers when Mr. C. I. Welch, Assistant Superintendent of Traffic Class II, passed away on Saturday, Mar. 16, following a brief absence on sick leave. He was an unestablished officer and was due to retire from the service on April 6 on age grounds.

Mr. Welch entered the Post Office Telephone Service in 1904 and held the position of Night Superintendent until just after the war, when he was transferred to the day staff as Service Superintendent of the East section. He held this position until his death.

As a young man he was a keen footballer and in later years was an enthusiastic supporter of the Blackheath Rugby Football Club. For nine years he was secretary to the Leigh Road Baptist Church at Leigh-on-Sea, where his loss is keenly felt.

The interment took place at Sutton Road Cemetery, Leigh-on-Sea, on Mar. 20, and was attended by several representatives of the Department, including Messrs. Beaumont, Gray, Tree, Ware, and West.

* * * *

Sports Notes L.T.S.

Football.—The final match of the season was played on April 13 at Chiswick against the Taxes and was won by 3 goals to two. The run of the game favoured the L.T.S. who led by 3 to 1 until the last minute when Taxes succeeded in registering their second goal.

The match against Dollis Hill on the previous Saturday ended in a draw of 1 goal each, and as the Dollis Hill team are well in the running for the championship it was quite a good performance. As we had previously beaten the same team at Chiswick, inflicting upon them their only league defeat of the season, the loss of 3 out of the 4 points at stake may ultimately affect their prospects of winning the league.

Bowls.—It is hoped to open the Chiswick Green on Saturday, April 27.

At a committee meeting of the London Area section representatives held on April 10 it was decided to request all players to wear brown shoes with rubber soles, as is the custom on most other greens. This request, which will probably be embodied in the rules, has been decided upon as the result of representations made by the Chiswick Sports Council.

The practice adopted last year of making a collection at the end of the season on behalf of the Green Keeper will be continued this year.

Hand books will be ready for members by the end of April or beginning of May. The closing date for entries for the Civil Service Championships, to be held at Chiswick in August this year, is May 13, and entry forms may be obtained from J. A. Dickinson, KD.2A, Cornwall House, City 2000, extension 279.

Tennis.—Each year a greater enthusiasm for tennis is manifested. This year the London Telephone Service Sports Association is arranging for two Tennis Competitions, a "Singles Competition" for which it is hoped a trophy will be forthcoming, and the "Teams Competition," for the Cup presented by Miss Cox, and at present held by last season's winners—A.R.7 of the Controller's Office.

Cricket.—Civil Service Women's Cricket Association.—It is hoped to commence play at the Civil Service Sports Ground on Wednesday, May 1.

Practice at the nets Mondays and Wednesdays. Matches arranged for Wednesdays.

Applications for membership should be made to: Miss D. Simmonds, Ministry of Health, Kew, Surrey.

THE LATE CAPTAIN W. L. C. RATHBONE.

THE many friends and colleagues of Captain W. L. C. Rathbone, M.C., A.M., were greatly shocked to learn of his death, on Feb. 18, at the early age of 47. A very popular executive officer on the Accounts Branch, he was apparently in perfect health less than a week earlier, when he played a strenuous game in a table tennis tournament, and his death from pneumonia, after a few days' illness, came with tragic suddenness.

Captain Rathbone was an old member of the Civil Service Rifles, with whom he served throughout the war. His war record was a brilliant one, and he was awarded the Military Cross and the Albert Medal, besides being several times mentioned in despatches. He also held the Territorial Force Efficiency Medal. Prior to the Great War he had already seen active service, as he joined the Volunteers at the age of 16, and at 18 was fighting in South Africa in the Boer War. For his service there he held the South African War Medal with 2 bars.

In Muswell Hill, where he had resided since his marriage in 1911, he was one of the most popular and active members of the Muswell Hill Golf Club and had secured many trophies.

The Controller was represented at the funeral at the Great Northern Cemetery, and a number of his colleagues from the London Telephone Service and old comrades from the Civil Service Rifles were present.

W. M. E.

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SCENE FROM THE TELEPHONE PLAY. ["*Daily Mail*" *Copyright.*

THE TELEPHONE PLAY.

IT is proverbial that history repeats itself, and members of the London Telephonists' Association are accustomed to look upon the triumphant success of the Telephone Play—which has become an annual institution—as a matter of course. Miss McMillan's Play, "Telephone Tangles," given in St. George's Hall on April 4 and 5 last, more than justifies the faith that is in us. "The best ever" is the general verdict, worthily supported by a crowded and enthusiastic audience on each night of the play.

Briefly, the story is this: The President of The International Telephone, Telegraph, Television, Teletouch, Teletaste, and Telesniff Corporation (Mr. Beale) resolves to eliminate girls from the service of his Company—though there is an important exception in the person of a certain Supervisor (Miss Price) whom he means to retain at all costs and engages as his Shorthand-Typist. The scheme of elimination—clearly foredoomed to failure—runs counter to certain love affairs between two of his Managers (Capt. Hemsley and Mr. Whiffen), an engineer (Mr. Williams), and three of the telephonists, Phyllis, Joan, and Pamela (Miss Street, Miss Tilling, and Miss Latimer). But Love, of course, finds a way. At the suggestion of one of the lovers all the girls, on dismissal, dress up as boys and offer themselves for employment as Engineers' Assistants. The President accepts them at once, to the joy of the lovers; but the secret is soon revealed by the unduly tender solicitude of the lovers for their "Assistants'" welfare. The President, in a rage, tells his Managers that if they wish to justify their action in re-introducing the girls they must make a success of the Television apparatus, invented by one of the Managers, which up to this point had been a dismal failure. By the chance movement of one of the wires of the apparatus, one of the "Assistants" rectifies a fault in the design of the Television equipment, which now works perfectly. The President is summoned in triumph; but in using the apparatus both he and the Inventor see, to their horror, the beloved one apparently engaged in a convincing flirtation with someone else—a very timely reminder of the possible results of a really perfect Television scheme! In the language of the "Movies," both register despair. By way of a diversion, one of the "Assistants" tries the effect of the Television apparatus on the Sun. Instantly there is an explosion and the mechanism is wrecked—not altogether to the regret of those who have used it. Its success, however, has been demonstrated; and the President, in accordance with a promise he had made in such an event, invites the staff to his country house. Here, of course, all the tangles are unravelled. The secrets revealed by the Television apparatus are explained away to the mutual satisfaction of the lovers—the President included, and the inevitable happy ending justifies the whimsical conclusion of the Author:—

Though as a general rule, no doubt,
Falsehood's wrong—if you're found out,
Now and again you'll score, forsooth,
If you can sometimes dodge the truth!

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The amusing story was told with a humour and literary skill which always characterise Miss McMillan's work. Equally admirable was her selection of the music to which the lyrics were wedded, while both soloists and chorus excelled themselves. Miss Street (now Mrs. Blair-Jones), whom everyone was delighted to see in her accustomed part of the principal soprano, sang with all her old brilliancy and charm. Excellent, too, were Miss Latimer and Miss Tilling; while Miss Peggy Murray, as a farmer's boy, received special and well-deserved recognition for her most artistic rendering of the song "Leanin'." Miss Price took the part of the Supervisor with unfailing skill and humour; while Miss Jones again delighted the audience with her exceedingly graceful solo dancing. Of the men, Mr. Beale very ably sustained the part of the President, while Capt. Hemsley and Mr. Whiffen sang brilliantly throughout, the duet, "Vagabonds," being specially noteworthy. Excellent, also, was Mr. Williams as the Engineer; while Mr. Cherry covered himself with glory in his stage effects, the Television phenomena being admirably presented. All were glad to see Mr. Beck once more in the Telephone Play before his transfer to the District Managership of Exeter. He took the part of the Doorkeeper in an amusing "Lift" scene which preceded the first act, with his accustomed skill and humour. As in previous years, Miss Garvey at the piano proved herself to be an admirable accompanist, in which work she was ably assisted by the Misses Woodman and Beecroft; while the success of the play as a whole is another tribute to Mr. Pounds' abilities as a producer.

At the conclusion of each performance the pleasure of an enthusiastic audience was attested by calls for the Author and the presentation of the usual tokens of appreciation, in response to which eloquent tributes were paid by Author and Producer to the admirable work of the Cast, and to Mr. Cherry for his excellent treatment of the stage effects. Altogether the Play was an outstanding success, of which all concerned in the production have reason to be proud.

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WHERE TO STAY.

BOURNEMOUTH.—Marlborough, Richmond Gardens. First-Class Private Hotel, newly furnished and decorated throughout. Standing in own grounds, facing south. Sea views. Within few minutes of Pier, New Pavilion, Golf Links and all amusements.— Illustrated Tariff on request.

DEAN FOREST.—SEVERN-WYE VALLEYS.—BEAUTIFUL HOLIDAY HOME (600 ft. up). 80 rooms, extensive grounds, motors, golf, billiards, tennis, bowls, croquet, dancing. Electric light. Boarders 52*s*. 6*d*. to 70*s*.—Prospectus: Littledean House, Littledean, Glos.

THE "BOOT INN," BERWICK ST. JAMES, NR. Salisbury. W. C. Ellwood, Proprietor. Good Accommodation for Motorists. Parties catered for. Nearest First-Class R.A.C. Inn from Stonehenge. Garage and Filling Station. Cars for Hire. Noted House for Sparkling Ales, Wines and Spirits of the Finest Quality. Fully Licensed.

GLASGOW TELEPHONE NOTES.

How to Complain.

"IF I was well I don't think I would have sent in this complaint. Perhaps the girl who attended the phone is not well herself. If that is so I am very sorry I have sent in this complaint." (Extract from a subscriber's letter.)

An Appreciation.

"As your staff often get 'kicks' I think they should also get the 'ha-pence' when due, and I wish to congratulate you on a very smart operator.

On Sunday evening about 6.5 p.m. I was about to catch the 6.10 train, when I found I had left a special book at home. I rang up my *house* from the call-box at the Station, but wife, family, and maid were all out and there was no reply. The operator asked if she could give a message—such a thing several years ago would have been looked upon as 'inhuman'—I was rather amazed, but gave her the message, and received the book next morning at 8 a.m.

What the operator did may have been a little out of the usual, but I wish to congratulate you on training your staff to be of service where possible, instead of being mere 'plug punchers.' The girl on duty certainly deserves a word of praise, and no doubt you will see that she gets it, as if rebukes are given, praise is due when deserved."

And so say all of us!

Mr. C. S. Scantlebury commenced his training as an Assistant Traffic Superintendent on April 10.

We welcome him from distant Plymouth, and trust that his sojourn in Glasgow will be a happy one and hope that any regrets he may feel at leaving the sunny South for the colder North will be more than offset by his experience here, and that memories of Devonshire Cream and Cider will be dimmed by the delicacies of the Land o' Cakes.

Contract Branch Notes.

Development.—An entire re-study of the Glasgow Local Fee area for Automatic purposes has just been concluded. On completion of this work the following officers on development allowance duty were released for similar work in other districts: To Newcastle, Mr. J. F. Brodie. To Liverpool, Messrs Jas. Blackwell, R. H. Wilder, and A. E. Dickson. We shall miss these colleagues but as they are only "on loan" we hope to welcome them back *if* an armistice is declared on "development." Still, some folks have a bad habit of retaining borrowed articles, and England may not be in a hurry to return the Scots.

Increase of Staff and Promotion.—Authority has been obtained to increase the establishment of Contract Officers to 22 Class II, and 3 Class I posts. The third Class I vacancy has been filled by the appointment of Mr. S. W. Russell who has, as Acting Class I Contract Officer during the past nine months, supervised the automatic development squad with conspicuous success.

Our congratulations and good wishes to Mr. Russell on his well-earned move to substantive rank.

LIVERPOOL TELEPHONE NOTES.

IT is with the deepest regret that we announce the passing of Miss Rose O'Malley, Bank Exchange. Her activities covered many spheres. She was a great worker in the cause of charity, and those who suffered misfortune or illhealth found in her a devoted friend. One never appealed in vain to Rose for assistance in a good cause, and the loss of her presence will be keenly felt. A lover of flowers, she carried them into the Switchroom, and the care she bestowed on the plants year in year out, brought brightness into the exchange. She was for many years a member of the Central and Bank Dining Committee and of the Fines Fund.

The funeral took place at Anfield Cemetery, Requiem Mass being held at St. Charles Church. The wealth of floral tributes received from the Postmaster-Surveyor and Exchanges reflected the love and esteem in which Miss O'Malley was held by her colleagues. We offer our sincere sympathy to her mother and sisters in their great loss.

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A BRIEF CHRONOLOGY FOR STUDENTS OF TELEGRAPHS, TELEPHONES AND POSTS.

BY HARRY G. SELLARS.

(*Continued from page* 100.)

1879, Mar. 12 ... (Edwin Clark originated the "Britannia" joint for wire connections. M'Intire, U.S.A., introduced the sleeve joint. Chatterton introduced a mixture of resin, Stockholm tar and gutta-percha for insulation purposes.)

Moseley introduced a battery with zinc in sea-water and tinned copper in sulphate of lead paste.

(Sir William Thomson and Trouvé also constructed batteries.)

1879, Apr. 1 ... Charge of 2½*d.* for advice of delivery of a foreign or colonial registered letter introduced. Number of registered letters reached 9,000,000.

Sir William Siemens suggested that the electric arc might be used in the fusion of metals and constructed an electric arc furnace.

The Bell and the New England Telephone Companies combined as the National Bell Telephone Company.

1879, Apr. 29 ... Edison's loudspeaking telephone exhibited to the Royal Society. Experimental exchange opened at 6, Lombard Street, London.

1879, June 11 ... Sandford Fleming, of Canada, suggested that "British possessions to the west of the Pacific Ocean should be connected by submarine cable with the Canadian line."

1879, June 21 ... Alexander Marr, of Manchester, patented a granular carbon telephone transmitter with a pine diaphragm.

International Telegraph Conference held in London.

1879, Aug. ... First English telephone exchange opened at 36, Coleman Street, London, with a two-panel "Williams" switchboard.

Telephone exchanges opened in Glasgow, Manchester, Liverpool, Sheffield, Edinburgh, Birmingham and Bristol.

1879, Aug. ... Edison Telephone Company of London Limited, registered.

1879, Sept. ... Edison Telephone Company's exchange opened at 11, Queen Victoria Street, London. Subscribers used carbon transmitters and chalk receivers.

Baudot admitted to Legion d'Honneur.

Oliver Heaviside suggested introducing "leak" circuits and self-induction into cable lines.

Cavendish's hitherto unpublished papers on electricity edited by Professor Clark Maxwell.

1879, Nov. 5 ... James Clark Maxwell died.

Sir William Fothergill Cooke died.

1879, Nov. 7 ... E. R. Graves, Post Office Engineer-in-Chief, and W. H. Preece, inspected the Coleman Street Telephone Exchange.

Edison constructed an electric lamp with a carbonised brown-paper filament.

Electric motor tractor used for ploughing at Sermaize.

1879, Nov. 29 ... C. E. Scribner patented the Universal Telephone Switchboard (manufactured by the Western Electric Manufacturing Company.)

1879, Dec. 13 ... M. D. Connolly, T. A. Connolly and F. J. McTighe, of U.S.A., patented the first automatic telephone system.

(S. A. Varley devised the "Mill," a type of automatic switch.)

Eastern and South African Telegraph Company subsidised (£55,000 per annum for 20 years) by the British, Cape and Natal Governments for the cables from Aden to the Cape.

Eastern Extension Telegraph Company obtained subsidies (£32,000 per annum for 20 years) from the Australian Government for maintaining communication with Australia, including the duplication of the Penang-Australia cable.

Atlantic cable laid between Brest and St. Pierre for Compagnie Francaise du Telegraphe de Paris á New York.

1879, Dec. ... D. E. Hughes experimented in wireless telegraphy.

Post Office Savings Bank depositors 1,889,000, value of deposits, £29,000,000.

1880, Jan. 1 ... Rates for Colonial Money Orders reduced to the same as those for foreign money orders.

1880, Jan. 8 ... Lake's telephone transmitter patent assigned to Francis Blake.

1880, Jan. 14 ... Louis John Crossley patented a telephone receiver in which only one pole of the U-shaped magnet was fitted with a wire coil.

1880, Jan. 29 ... G. Westinghouse, of Pittsburg, Penn., patented an automatic telephone system.

W. Johnson constructed a telephone transmitter containing three carbon pencils. A shunt resistance coil was attached to prevent the circuit being broken if the pencils were displaced, and to obviate excessive sparking if the current were too strong.

Marr produced his "Inertia" telephone transmitter.

Dolbear invented a condenser telephone receiver.

John Trowbridge experimented, at Harvard, in wireless telephony and suggested communication between ships.

First Irish telephone exchange opened in Belfast.

First English trunk telephone line opened between Leeds and Bradford.

1880, Apr. 26 ... First printed list of telephone subscribers issued containing names of subscribers in London and upwards of 16 provincial towns.

1880, May 13 ... The two London Telephone Companies amalgamated under the title United Telephone Company of London.

W. Spottiswoode constructed a giant induction coil in which the secondary circuit contained 280 miles of wire, wound in 340,000 turns, with over 100,000 ohms resistance.

Ayrton and Perry measured the difference of potential for different pairs of metals.

Professors Ayrton and Perry designed an electrical energy meter. Dr. Aron, of Berlin, modified and improved it.

Professors Ayrton, Perry and Fleming Jenkin constructed an electric telepherage railway, in which the cars are suspended, at Glynde, Sussex.

Preece calculated the current necessary to fuse wire. He proposed calling the unit of electric power a "watt."

(H. R. Kempe, who was engaged for a period of nearly two years in the laboratory of Sir Charles Wheatstone, invented a means of measuring the internal resistance of a battery, and designed a special shunt compensation box.

Mance introduced another method of measuring internal resistance of batteries and Dr. Muirhead modified Kempe's system.)

(*To be continued.*)

PRESENTATION TO MR. BECK.

To part with a colleague is seldom pleasant; but the ceremonies attached to these partings are often the occasion of so much good-will that we can sometimes say (as Juliet nearly said):—

"Parting is such sweet sorrow,
I could say good-bye until to-morrow."

This thought was particularly with us when, on April 11, the colleagues of Mr. T. A. Beck gathered—in large numbers—to bid him farewell and to wish him good luck on his transfer to Exeter to take up the appointment of District Manager.

The Controller, presenting Mr. Beck with a sideboard subscribed for by his many friends in the service, said that our loss would be the Provinces' gain (reminding us of a somewhat debatable Scottish saying, "It's no' lost what a friend gets!"). He said that he had been connected with Mr. Beck for thirteen years, and had had plenty of opportunity of observing his high qualities and capabilities. He spoke, too, of Mr. Beck's genial personality, reminding us that only recently we had seen Mr. Beck as a very successful commissionaire in the Telephone Play.

Mr. Beck, who seemed quite unmoved when reference was made to his future proximity to Dartmoor, said that he was leaving London with mixed feelings. He would always remember the happy days he had spent in the London Telephone Service. He had tried to make his slogan "Look after the staff, and the staff will look after the service." This was received with loud applause—evidence, no doubt, of Mr. Beck's successful carrying out of the slogan.

For our part, we hope that Mr. Beck's rapid rise in the "Telephone Play" from the post of a humble doorkeeper to that of no less a being than the Sun God, may be symbolic of his future progress in the service, and that he will soar, from the role of an unassuming Superintendent of Traffic to that of—well, whatever the equivalent of a Sun God is in the service.

J. McM.

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THE

Telegraph and Telephone Journal.

VOL. XV. JUNE, 1929. No. 171.

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TELEGRAPH AND TELEPHONE MEN AND WOMEN.

LXV.

MR. E. J. GAYES.

MR. E. J. GAYES, the Surveyor of the North Midland District, after being appointed to the Accountant-General's Department, took up service in the Secretary's Office, became an Assistant Surveyor in 1899, and has now been a Surveyor for nearly ten years.

The Postal Service, by reason of its magnitude, must necessarily take the premier place in the cares of Surveyors, and, in days gone by, the majority of Surveyors were content to leave the oversight of the Telegraph and Telephone Services largely to their assistants. Their successors of the present day, however, take a very active interest in the technical services, and Mr. Gayes, in his sphere, has contributed much to the substantial progress of recent years.

Mr. Gayes has the priceless gift of a merry heart, and that may be one of the secrets of his abounding energy.

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HOW TO IMPROVE THE TELEGRAPH SERVICE.

V.—BY AN ENGINEER.

[NOTE.—*The Editorial Board takes no responsibility for the views expressed in this series of articles.*]

"How to Improve the Telegraph Service" is a subject that may be dealt with in several ways, all of which are of importance. The chief consideration will be the improvement of the telegraphs as a public utility service. The conditions of employment of those engaged in the industry are also an important factor. Finally, there are the improvements to be envisaged as a result of scientific and technical development, such, for example, as the substitution of printing to replace hand-worked systems of telegraphy, &c.

It is right that the subject should be examined from these three angles.

The public user of the telegraph system requires that the service should be speedy, accurate, and reasonable in cost. It is fair to say that, in general, there is no complaint made in regard to the speed of signalling. Telegrams can be dealt with, at any rate on our most important circuits, at a speed of working that meets all reasonable requirements. It must be admitted however, that delay in disposing of traffic at busy periods is a serious one and it cannot be claimed that a telegram is dealt with as it should be, when delays exceeding 30 minutes are recorded on main channels working to and from London. The writer was told a few days ago of a business man who handed in a telegram at Euston Station, ordering his motor to meet him on arrival at Birmingham. The sender reached his Birmingham office, over 100 miles away, before the telegram was delivered. This incident is not an isolated one.

The restriction in the number of telegraphic channels, by cutting down the staff to the lowest economical limits, is partly responsible for these delays and, as a result, the service is losing the confidence of the public as a speedy means of communication.

The system of delivering telegrams by "walks" has also given the public the impression that the ideal of speedy despatch of telegrams has been dispensed with. It is, of course, a different matter when the addressee is connected by telephone to the telegraph office and the written message is delivered as a confirming document, subsequent to dictation by telephone. But to regard a telegraph messenger as a miniature postman is foreign to the basic idea of the service and this arrangement detracts from the value of the telegraph. Rapid transmission by skilled operators is somewhat farcical when delivery is delayed until a messenger's load has been accumulated for a "walk." It is immaterial to the sender and recipient whether delay to a telegram occurs at the handing-in office, a transmitting office, the receiving office, or on the "walk." It is absurd to rush a message from Glasgow to London in 5 minutes and then inordinately delay its delivery, in order to save expense on the least costly portion of the service.

It is considered that the arrangement of dictating telegrams by phonogram should be given much wider publicity. The telegraph and the telephone should work hand in hand in this and in other respects, and the public should be made aware in every possible way of the value of the telegraph service. One visits post offices up and down the country and finds the walls of public offices displaying advertisements of insurance companies and business houses, but one looks in vain for any special reference to the telegraph service. It seems to be past praying for! Could not the Postmaster-General make it a rule that wherever advertisements are displayed in post offices there must be a prominent position reserved for a framed poster, calling attention to the advantages and conveniences to the public of the telegraph service? The Empire Marketing Board has indicated very successfully what can be done by a public department in demanding that we should "Eat more fruit" and "Drink more milk," and there is no reason why a determined effort should not be made to tell the public that they *must* "Use the wire!"

It is the rule to charge for telegrams on a flat-rate basis; to deal with the message in a similar way to that of letters or parcels sent by post, whereas in the case of the trunk and junction telephone systems calls are charged for in zones—the longer the distance, the greater the cost. It is worthy of consideration whether such a system of charging should not be introduced for the telegram and greater regard paid to running the service on business lines. There appears to be justification for a differentiation in the cost of a telegram from London to Stornoway and one from London to Croydon. The introduction of a zone system of charging might also be accompanied by a reduction in the charge for social and local telegrams; say at the rate of 8 words for 6*d*.

It must be confessed that there is a certain feeling of discontent pervading practically all the grades employed in the telegraph service. This discontent is due in large measure to lack of prospects. Whilst the telephone service is expanding in every direction, telegraphists see *their* department contracting each year and, as a result, the number of higher appointments reduced. The manipulative work tends to become a matter of routine and in the course of years the operator is so expert that he is able to perform his work with a minimum of effort. This is not to say that the work is unskilled or unimportant. It requires close attention and alertness, but in this, as in other matters, practice makes perfect, and an experienced operator is able to perform his duties with a certain subconscious control that tends to make the work mechanical.

It is essential that the outlook of the telegraphist be changed and feelings of co-operation and *esprit de corps* introduced, otherwise the present tendency to apathy will continue, to the detriment of the service and those connected with it. How can this be effected? In the writer's view, telegraphists should not be retained as operators throughout their whole term of service. They should be encouraged to study such subjects as Accounting, Economics, Electrical Engineering, Languages, &c., and places found for qualified men in other departments, either by nomination or examination. Ten to fifteen years should be the normal maximum period for employment as an operator and, during that time, the officer should be equipping himself in some form or other for progress in his own or in other departments.

Telegraphists quickly obtain knowledge of the general working of the Post Office; they are subject to discipline and control, and acquire what is known as "The traditions of the service." This good material, caught young, would be of value in other departments and, if opportunities of advancement were afforded, the writer believes that a new spirit would be created and the staff take a more personal pride in the business.

There are two matters allied to the operating arrangements that should be mentioned here and, although difficult to overcome, should be discussed frankly in an endeavour to find a solution. In the case of busy commercial circuits, continuity of manipulation by the same operators is of great advantage. The telegraphists become conversant with any variations of the electrical circuit, the nature of the traffic dealt with; also the operators at each end of the circuit become acquainted with each other. These factors make for smooth and efficient working.

There is also the thorny subject of payment by results. In the writer's view, something should be done to reward good work on busy and important circuits. If a bonus or allowance is objected to, then some other form of recognition such, for example, as more regular duties, or a Saturday half-holiday, might be con-

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EXTRACT from "THE TIMES."
8th May, 1929.

HAND-COMBINATION TELEPHONES.

AN IMPROVED TYPE.

The design of the modified type of telephone, to which the Postmaster-General recently referred in the House of Commons, has now been fully worked out by the Post Office engineers and an order for a substantial number has been placed with a London manufacturer. It is a reversion to the hand-combination type, superseded 20 or 30 years ago by the pedestal type of telephone now in general use, but greatly improved.

A considerable section of the public has constantly shown a preference for this type known by the Post Office as the microtelephone, and it has been retained in some European countries for that reason, though its efficiency has been found to be 15 per cent. or more below that of the pedestal instrument. The recent change in the situation has resulted from the development, in the research department of the Post Office Engineering Department, of a new type of transmitter, which, when mounted in a microtelephone, apparently secures and maintains the full talking efficiency of the standard pedestal instrument. This new transmitter receives the acoustic energy of the voice upon a light but rigidly constructed diaphragm having an elastic edge, instead of upon the uniformly flexible diaphragm hitherto employed to impress the varying pressures of the air waves of speech upon the small box of carbon granules, which, by consequent changes in resistance, impresses corresponding modulations upon the electric current conveying and reproducing the speech at the distant end of the line. The external form of the new set closely follows a design recently produced by the American Telephone and Telegraph Company and brought into service by the American Bell Companies. The base and cradle of the instrument and its electrical circuit, however, depart widely from the American design and are thought to embody practical points of superiority. The new instrument will be applicable both to the manual and the automatic exchange systems. All that is required to adapt it to the automatic system is the addition of a calling dial to a fitting provided in readiness for it on the base of the instrument.

The microtelephone set is necessarily of more expensive construction than the standard pedestal set, and its maintenance cost will also be greater. The Post Office is therefore faced with a position of some difficulty. It has very large stocks of the existing standard instruments, and more than 1,000,000 sets are now in use. It would be a very serious matter financially if the bulk of these instruments were thrown back upon the hands of the Post Office by a widespread demand for the new instruments, particularly as for desk work the pedestal type has long been regarded as the most efficient design obtainable. This difficulty has been met in America by the imposition of an additional rental charge of 50 cents a month, equal to about £1 5s. a year, for the use of a microtelephone set. It is probable that the American example will be followed and the Post Office will make an extra charge when it places the new instruments in service in this country.

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sidered and, in the case of able, energetic telegraphists, opportunities for more rapid advancement offered.

The telegraph system of this country has been built up in stages over a number of years, as a result of scientific and technical development, designed to meet the traffic requirements. The policy underlying all operations has been that it is first and foremost a public utility service, available for the convenience of all: from the city merchant to the inhabitant of the smallest village in the Kingdom. Bearing these facts in mind, it has also to be remembered that the type of telegraph instrument installed in a village post office is of a different kind altogether from that required to connect two busy offices. As a result of gradual development, there are many different types of apparatus in use nowadays, ranging from the Single Needle, the Wheatstone A.B.C., to the latest form of Teleprinter. This multiplicity is very marked in large instrument rooms and operators are called upon to manipulate Morse, Baudot, or Teleprinter apparatus. This duplication also leads to increased maintenance costs.

There are indications of a considerable expansion in the use of Teleprinter apparatus in the British Post Office. This machine has been developed into a highly efficient and reliable instrument and may be compared in its operation to a modern motor-car. Although both the motor-car and the Teleprinter may be regarded as highly developed engineering products, they cannot give the best service unless handled carefully and intelligently, with a whole-hearted desire to secure the best results from the use of the machines.

It would appear that the time is opportune for a thorough-going standardisation of apparatus. The use of the phonogram service should be extended so as to cover all the smaller telegraph offices and, where the traffic exceeds a certain daily maximum, and where electrical power is available at reasonable cost, Teleprinter apparatus should be used. The writer is of the opinion that the Teleprinter should be regarded as *the* standard instrument for ordinary telegraph purposes and that it should replace all Morse. Baudot and other printing systems for inland working.

The Teleprinter has a standard type of keyboard that can be operated by a typist without expert knowledge of other forms of signalling. Operating costs will be reduced by the employment of typists for the work. In addition, arrangements should be made to associate the apparatus working between busy centres with Voice Frequency, or Composited Systems, and by this means the cost of line provision reduced to a minimum. The substitution of Teleprinters will justify a more generous provision of unified spare apparatus, tuned up and ready for use at the point required, so that if any mechanical defect occurs on a working set, the instrument can be changed within a minute or so and traffic delays avoided. It is also an essential part of this proposal that one or more mechanics, with expert technical knowledge of the apparatus, are available in each engineering section and also that there should be a scheme of periodical overhaul and adjustment of instruments at a mechanics' workshop attached to the Engineering District Headquarters. Stability of operation would thus be ensured and contact maintained with telegraph offices throughout the Kingdom through the co-operation of official motor transport services.

It is essential also that greater regard be paid to the requirements of the telegraph service on the part of Inspectors and other controlling officers in the Engineering Department. Specialised knowledge of telegraph apparatus should be regarded as a requirement in the case of one Inspector at least in each engineering section, in order that he may efficiently supervise the mechanics and other workmen engaged on telegraph duties and be ready to give expert assistance in case of need.

[The next article in this series, which will appear in our July number, is by a provincial Chief Superintendent of Telegraphs.]

THE CONTRACT OFFICER AND THE CALLING RATE.

BY R. S. GROSVENOR, GLOUCESTER.

As commercial representative of the department, the Contract Officer is required to traverse the highways and by-ways in search of new business, interview existing subscribers regarding additional facilities, and visit subscribers who have given notice to cease their connexions, using every endeavour to retain them.

Smart appearance, good address, unlimited tact, careful discretion and a persuasive manner, combined with full confidence, are essential assets to a successful Contract Officer.

That the Contract Officer *is* successful, the consistent increase of new lines and stations amply proves.

A life full of variety, daily meeting many types and classes of the community, one visit calling for an interview with the head of a large firm, the next with someone in a small business, followed by a call on a lady of leisure.

A revenue-earning officer, a telephone pioneer, ever breaking new ground, sowing seeds of business and tending those seeds with great care, watching and waiting until the plants have grown so that in due time the harvest of orders is gathered. Such is the Contract Officer's duty—one day encouraged by success, the next day doomed to disappointment.

An officer engaged on this duty should know as much as possible about the goods he has to sell, i.e., the telephone service generally.

Facilities for obtaining this knowledge should always be readily available and every assistance given by other branches of the telephone service to attain such knowledge.

It has to be kept in mind that the Contract Officer, in obtaining new business, is in touch with the public at the very commencement of telephone education. First impressions go a long way and are lasting. It is therefore essential that the prospective subscriber should always be given the fullest information not only with regard to tariff, fees, &c., but as to the many facilities the service offers. It is an impressive fact that, at the moment, the mere fitting of a telephone provides the possibility of speaking to about 26 millions of persons. Again, prospective subscribers would perhaps frequently be more readily convinced if given an indication of the value of the plant (internal and external) which has to be provided for an individual exchange connexion. This initial cost varies somewhat between one area and another but a general figure is £40 to £50 per line. These costs include subscriber's apparatus, subscriber's line plant (with the commensurate spare plant) and exchange equipment individual to the subscribers.

The essence of good business is to obtain an order in such a manner that a repeat order is certain to follow. This axiom especially applies to the use a *new subscriber* will make of the service.

It is our business to see that subscribers make *maximum use* of the service. The way in which an interview is conducted and the various facilities presented has a very important bearing on the use that will be made of the connexion.

In many cases an order is obtained because a person has a specific use for the telephone, or is persuaded that such is the case, but if a definite knowledge and impression of the excellent facilities always available are left behind, then the order obtained will be considerably enhanced in value.

The Contract Officer is, of course, fully conversant with all the facilities of the telephone service, but it is well to mention the necessity for keeping the following lesser-known services in

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mind, viz.: originating and receiving telegrams, cablegrams and radio telegrams, express letter and telephone letter service, Post Office express messenger service.

There is no doubt these very useful services would be utilised considerably more if they were better known and thus be of much greater advantage to subscribers and the public generally, with consequent additional revenue to the department.

The importance of visiting existing subscribers, both business and residential, with a view to obtaining agreements for extension facilities of all kinds cannot be too strongly emphasised. The more telephone facilities there are installed at subscribers' premises, the greater the calling rate will be stimulated.

The country at the subscriber's elbow from a telephone in the private office at business, or in the study at the house, thereby giving opportunity for immediate use, undoubtedly means more calls being originated than would otherwise be the case.

Generally speaking, it should not be left for subscribers to enquire for particulars regarding extension facilities. Such business should be sought at every opportunity, and experience shows that good results will certainly accrue. It is not only the additional rental revenue obtained, but the important bearing such increased facilities have on the calling rate, that is an essential factor.

Again, the Contract Officer when interviewing subscribers sometimes receives complaints of various kinds. In such cases, the matter should be reported without delay to the proper quarter, all available details being stated, in order that full attention may be given and thus prove to the complainant that the Department is determined to maintain a thoroughly satisfactory service.

When visiting subscribers, the Contract Officer can do much to foster and stimulate the use of the service.

This leads to that part of a Contract Officer's work dealing with "Notices to cease," which requires no emphasis here as to its importance.

Notice to cease is given by subscribers for a large variety of reasons, and the returns show how well these are generally overcome by the Contract Officer and the fatal notice withdrawn.

In many instances, having obtained withdrawal of the notice, a further step can be taken and increased use encouraged by impressing upon the subscriber the value of the service *as applied to that particular case.* No opportunity of doing this should be missed. Full confidence in the utility of the service should be imparted wherever possible.

The point of view of the Contract Officer, not only to secure an order or retain a connexion, but to keep in mind that it is essential *increased use* should be encouraged, will considerably help to induce a higher calling rate.

THE RURAL AUTOMATIC EXCHANGE.

BY H. E. P.

THE first Rural Automatic Exchange of a new standardised type was opened at Haynes, near Bedford, on the 4th of February, 1929.

It may seem premature to pass comment upon the behaviour of so recent an innovation, but it can be safely recorded that climatic conditions, at least, have fully tested the Haynes equipment.

Since its opening, every variety of the English weather has been experienced from blizzards to mild steamy heat. Ice could be scraped off the walls inside the building during the installation of the apparatus when fourteen degrees of frost were recorded. From a climatic point of view, therefore, this new type of equipment leaves a mere traffic man wondering why the hygrometers and thermometers which are so prominent in automatic exchanges should not be presented to the operating staff, for the telephonist certainly cannot withstand the temperature variations of Rural Automatic Exchange equipment.

The first exchange of this type has been a noteworthy success; and there are no indications that there will ever be, from the service side, any other comment to make regarding it. The second rural automatic exchange in the St. Alban's Telephone District was opened on May the 1st, and beyond a slight difficulty through a caller failing to press button "A" on the Hall Multi-Coin Box and thereby unduly holding the junction to the parent exchange, no untoward incident has occurred.

It is quite a simple task to operate the calls at the parent exchange, once the habit of trying to answer without depressing the Coin-box Tone Key is overcome. The engineer who designed the circuit so that nothing can be heard until it is depressed was a psychologist.

The non-standard ringing tones in actual practice give rise to no confusion. As everyone knows, there are, as far as the average subscriber is concerned, only two tones. The first is a noise like a generator which causes him to conclude that the other subscriber is being rung; the second sounds like a regretful and apologetic tone, which leads him to conclude that the call is ineffective for reasons generally not understood, and he tries again later. The beautiful rhythmic differences between a "number unobtainable tone" and a "busy tone" are, as a rule, lost on the lay ear: As for the "dialling tone," half the subscribers never wait for it; "if at first they don't succeed" they try again. Therefore, when the non-standard Rural Automatic Exchange tones were first heard, they were sufficiently similar to the standard "ringing" and "busy or number unobtainable" tones to cause no confusion. Of course, some subscribers do remember the careful instructions of the visiting officer.

The routine of R.A.X. transfers has now reached a final stage but there are still one or two features which will appear when new conditions occur. The two-outlet R.A.X. will give rise to routing problems which are not so formidable as novel. Switchboard notices will probably dispose of all these cases. There will be a Hall Multi-Coin-box for which tickets may be prepared at two exchanges, and the Accounting Departments will have a merry time with "discrepancies" though not by any means is this a difficult problem to solve.

Another feature arises in connection with emergency calls for Fire, Police, and Ambulance. The "2222" standard number for automatic exchanges has been adopted in this District for R.A.X.s also, in so far as "22" has been reserved on all R.A.X. equipments even if there is no local Police or Fire number, so that at a future date, this number can be assigned to the Police when required. All calls for "Fire" are thus connected to the local Police who are best able to determine the boundaries of brigade areas, and it is a responsibility beyond the Department's function to select the particular brigade applicable. If no response is obtained from the "22" number, the subscribers instructions notify them that by dialling "0 1" they can always obtain assistance. A "no reply" from "22" numbers is not out of the question in rural areas when the local police officer is on patrol duty. In areas where there is no local police officer, the question arises whether the "22" numbers should not be jumpered on the outgoing side so that if "22" be dialled the call nevertheless reaches the parent exchange. This would allow of the standardisation of "22" for Fire, Police, and Ambulance calls.

It is not difficult to see that an extension of the Rural Automatic Exchange system would change the character of telephone working in country areas. Amongst other things, however, it would cause a loss to the local traffic staff of that peculiar charm of the rural exchange where the sub-postmaster is the friend and Adviser-in-Chief of the community.

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TELEGRAPHIC MEMORABILIA.

"*Certa Cito*," is the recently sanctioned motto for the Royal Corps of Signals. What could better express the telegraphic ideal than, "Swift and Sure"?

To those regular readers of the *Telegraph and Telephone Journal* who may happen to open their June copy at this page and at the same time may open their eyes with mingled surprise, regret, or perhaps even with relief, I would request such to kindly turn to a leading article of this issue for the explanation of the apparent—it is only apparent—curtailment of my monthly contributions to these pages. *Revenons a nos moutons*!

The growing need of the nations of the world for direct telegraphic and telephonic communication with their colonies and foreign agencies is almost daily evidenced. Belgium, for example has just placed an order for a short-wave telegraph-telephone transmitter, with the Marconi Company, for use between that country and the Belgian Congo, and also for communication with South America where she has growing business activities.

Again, the Portuguese Radio Marconi Company has sent a "proposal" to the Minister for the Colonies for the establishment of wireless stations in Portuguese India, Macao and Timor.

In apparent direct connexion with this "proposal" comes the news from China, per Reuter's Agency, that a party of engineers had actually left Lisbon but a few weeks ago to establish a short-wave telegraph station at Macao.

Never before in the history of telegraphy and telephony has there been more solid ground for satisfaction on the part of an administration, than should legitimately exist in the mind of the British Post Office when the above and similar instances are recalled to mind. Whatever may be the results of the future spread of short-wave working in the one case and of Trans-Atlantic Telephony on the other, it is undeniable that the world has followed Great Britain's lead.

The British Post Office is a modest organisation. Probably too modest for its own aggrandisement or even to do itself mere justice. Yet the very solid fact remains that the heavy spade-work in inter-colonial radio-telegraphy and also in Trans-Atlantic Radio Telephony has been very largely performed by the assiduous labours of its officers. I have of course not forgotten the pioneer efforts of the Marconi Company as regards the former service, and the whole-hearted co-operation of the American technicians as regards the latter service. As regards the former, though "others may have entered into their labours," it is true to affirm that the new services have been ably organised, efficiently worked and that to a standard which has earned the praises of not a few of the world's experts.

To those of us who visualise Iceland as a dreary, desolate sparsely populated island, who would have believed that it contained nearly two thousand miles of overhead and covered telegraph and telephone cables, all in full operation and that the last annual return showed an increase of 150 miles over its predecessor?

I have only been privileged to read a condensed report of a paper read before the Indian Section of the Society of Arts, by Mr. A. T. Cooper, M.Inst.C.E., etc., etc., on Telegraphy in India, but even condensing the "condensed," readers will realise how very seriously British officials have been studying telegraph problems in that country these last few years.

The principal improvements in land-line working have been in connexion with long-distance circuits employing high-speed printing systems. Here the use of regenerative repeaters has rendered quadruple Baudot "up and down" working possible over the very longest circuits in use in that country. The report continues:—

> "Specially designed Baudot typewriter keyboards and converted Murray keyboards with tape transmitters have been recently installed on some of the main circuits as a labour-saving experiment, and their operation is being closely watched. On short and less important circuits similar efforts towards saving labour and plant have been made by the introduction of modern types of concentrator switches and of the composite method of Morse working, while in the large telegraph offices, Lampson carriers have been installed for the conveyance of messages to and from the instrument tables."

Despite one's appreciation of the very considerable amount of artistic talent among the Telegraphist craft I cannot recall any picture of note either in a private or public collection which has made the telegraphist or telegraphy an outstanding feature—except for certain war-time sketches. This year's Royal Academy picture of Mr. Fred Roe, entitled "S.O.S." has however filled the gap although the Morse key in the wireless cabin appears to have been placed in a very unconventional position!

A real union of the Telegraphs and Telephones will be found in the projected Trans-Atlantic "Telephone" Cable, which it is stated, will provide Two-way telephone transmission and eight or ten telegraph circuits.

An inscription on a Chinese Vase. If we go forward, we die; if we go backward, we die; better go forward and die.

J. J. T.

GLASGOW TELEPHONE NOTES.

IF a good start is half the battle, then Miss J. B. McLeod, late of the Douglas Exchange, has gone a long way towards the winning post. Miss McLeod has recently joined the ranks of the blest—sorry—and given up her duties with the Department to the more or less onerous responsibilities of wedded life. On Friday, April 19, our colleague had a splendid send-off, and opportunity was taken to "make a night of it." Practically all the Douglas Staff foregathered in the Dining Room for high tea and a social evening. Success was assured from the outset, for the atmosphere was such that pessimism and dull care were rapidly blown to the four winds of heaven. A few brave representatives of the mere male were present at the Concert, and, so far as is known, they stood the experience fairly well; at all events, they are now sitting up and taking nourishment. The single and concerted items were excellently rendered. The presentation of a handsome writing bureau and silver match holder was made by Mr. A. E. Coombs, our District Manager, to which Miss McLeod responded in a suitable and very feeling way. Miss Mortimer and her staff are to be congratulated on the excellence of the arrangements.

We regret to record the death of Mrs. C. Doherty, Telephonist, Central Exchange, on May 6.

Mrs. Doherty had been in indifferent health for some months, but the news of her death came as a shock to her colleagues.

Mrs. Doherty was a war widow, and had been with us about 11 years.

To her two young daughters and other sorrowing relatives we extend our deepest sympathy.

The Department and staff were represented at the funeral by Mr. E. E. Wilkins, Central Exchange Superintendent.

On Organisation.

"An effective division of labour is of the very essence of sound organisation" (Whitley Report). "Organisation is indispensable to growth. And yet too much organisation is indirectly repressive, for it increases the obstacles to those readjustments for larger growth and more perfect structure" (Spencer). "It is possible to over-organise, leaving too little to the stimulus of individual spontaneity, and bringing men of varied abilities and temperaments too near to dead-levelдom." . . . "Scientific management has put discipline on a new footing in allotting it to a functionalised officer, whose mission it is to encourage improvement rather than to penalise shortcomings" (J. Lee). "There is an organisation that tyrannises over character" (Emerson). "Administration is at least as much a matter of heart as of brain" (Report of Reorganisation Committee). "Foster a spirit of encouragement of right methods rather than carry on a campaign against wrong methods which may be out of all proportion to their part in the sum of the day's work" (*Telegraph and Telephone Journal*). "The first duty of supervising officers is undoubtedly that of organisation. If they would expend a fraction of the energy, now consumed in irritating and fussy fault-finding, in serious deliberation of the distribution of staff and traffic, there would be a distinct gain to all concerned" (Lara). "One of the great arts of all persons placed in authority is to multiply themselves, as it were, by a judicious and trustful employment of other men's intelligence and abilities. I am all day long engaged in seeing what other people are doing and can do. To do their work thoroughly, it is especially requisite that organisers should not undertake too much. Success results more from the limitation of effort than from anything else" (Helps). "More thought and less bustle, greater attention to lucidity of mind and less to physical effort and the undertaking of many trivialities, are not undesirable in relation to organisation in business" (Bligh). For the counsel of Jethro on organisation, read Exodus xviii, 13-26.

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PICTURE TELEGRAPHY.

THE technical press is promising us that, provided we have the necessary receiving apparatus, we shall very soon be able to receive broadcast pictures not from one or two, but from many countries in Europe.

Captain Fulton, it appears, has returned from his European tour during which he made certain arrangements for the regular broadcasting of pictures. The German transmissions commenced last month and probably before these lines are published the necessary transmitting apparatus will have been installed at both Prague and Budapest. Hilversum and Radio-Paris are also coming in on the regular services of the Fultograph System.

From Rugby, at the latter end of April, Stock Quotations, type printed on extra thin paper were fed into a special wireless transmitter and broadcast, while three ships, the *Orvieto*, the *Avilla* and the *Minnewaska*, previously provided with necessary receivers designed by the Marconi International Marine Communication Co. Ltd., while en route between this country and Australia, received the results, ready to be fixed on the respective news-boards of the liners mentioned.

Two years ago a brief description of the "Karolus" System of Picture Telegraphy appeared in the *Telegraph and Telephone Journal*, and this system has been making excellent headway, but not in the same direction.

The Karolus, or to give it its full title the Siemens-Karolus-Telefunken System of Picture Telegraphy, despite its easy adaptability to radio conditions of transmission has rather been utilised over underground, overhead lines, voice-frequency circuits, loaded circuits, etc.

Co-existant with the experiments of M. Bélin in France, those in Germany have also covered a period of about twenty years, always with a view to producing an effective international type of apparatus which should be capable of transmitting messages in any language, irrespective of a knowledge of the language itself or whether the language concerned is capable of being dealt with expeditiously by means of the alphabet of the Western world.

FIG. I.

Fig. I. shows an example of Chinese script as actually received over a long distance circuit. The utility of the system to Japan has not been missed by that wide awake country, and installations are either in situ for working between Tokio, Kioto and Osaka, or are actually in process. The Berlin-Vienna circuit was opened on December 1927, and at the moment, it is actually possible for Press pictures to be exchanged between London, Manchester, Paris and Berlin, Vienna and Cologne.

My latest information is that a speed of about 40 pictures per hour has been reached.

Should this be correct and should this rate even be exceeded, perhaps doubled in the future, we may, as some predict, be well within sight of a telegraph system which will need but the simplest form of human labours to deal with both transmission and reception, but certainly one highly skilled engineer or technician in charge of each installation. This at least one estimates from one's own observations when viewing a working set in Germany.

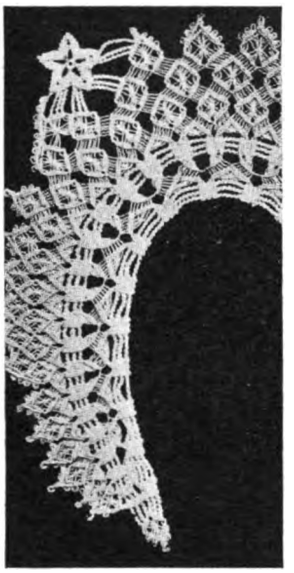

FIG. II.

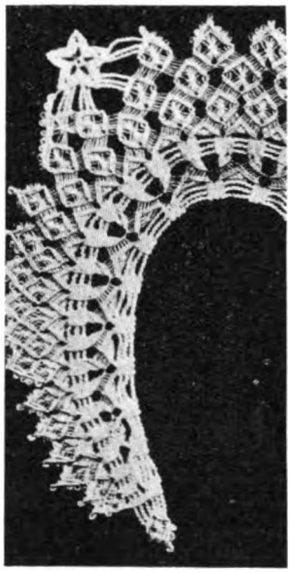

FIG. III.

This system has met every objection, one after another, until to-day there is "no previous treatment of the message or picture to be transmitted. All this is avoided, even a film or an emboss is unnecessary. A photograph, an autotype, a newspaper, handwriting, printing, or typeprinting can be placed direct on the transmitting drum of the sending apparatus," and telegraphed forthwith.

Figs. II. and III. are reproductions of an original lace design and the received copy respectively; the latter after transmission over an actual telegraph circuit.

J. J. T.

RETIREMENT OF MR. H MARSHALL.

AT a gathering of the Staff of the District Manager's Office, Scotland West, Glasgow, C.1, on May 8, a presentation of a pair of field glasses and cut glass vases was made to Mr H. Marshall, Chief Clerk, on his retirement from the Service.

Mr. Murray, District Manager, made the presentation, and spoke in very eulogistic terms of Mr. Marshall's worth as a Chief Clerk and one of Nature's true gentlemen. His career was a long and honourable one, having joined the National Telephone Company at Bradford as clerk in 1889, was transferred to Leeds in 1890, was promoted to Chief Clerk, Hanley, in 1893, and went to Coventry in 1896 and to Leicester in 1900. On the amalgamation of Leicester with Nottingham he was appointed to the Scotland Western District in 1925. As Mr. Marshall possesses a youthful appearance and his outlook on life in general is optimistic, he ought to take on a new lease of life, especially in view of the fact that he has selected Southport for his future home town. The District Manager also expressed keen regret that the time for his departure had arrived, as he felt the loss of a valuable friend and an able officer.

Heads of Departments also supported the District Manager, and on every hand the expressions of good feeling were very sincere.

Mr. Marshall thanked everybody for the kindnesses and good-will shown him, and said he would always cherish remembrances of Scotland.

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THE OUTLOOK.

PROBABLY there is no duty more fascinating in its elemental stages than that of preparing a picture of the future. To collect the material requisite for such a picture as affecting any one Town or District is somewhat laborious, and when it is done with one specific object the ultimate effect is apt to be lost sight of in the mass of detail.

We have tried to assure ourselves and all concerned that our estimates of telephone growths in the next 20 years are sound, but we have a distinct feeling of ignorance when we try to create the tones of colour that our picture should represent at the end of that time.

What will life be like when there are perhaps four or five telephones for every one that now exists? We are quite satisfied that there will be room for them but we must visualise to what extent they will be used. To this end every phase of activity must be examined to ascertain if possible what progress is probable in the same period. Of course, this review should come first, that is, before we estimate the telephone growth; and so it does but we have to present a convincing picture to those who are spending the money on the basis of the estimates.

What do we think is likely to happen that will make life different in 20 years time? We can but make comparison with the state of affairs 20 years ago or omitting the anti-progress period of destruction go back to say 1903—4. To some of us, it does not seem far back and we may be inclined to reflect that the same motives incite the human race and the changes are of little account. To those who are in their early years of understanding the antiquated forms of travel then in existence and the absence of world wide radio and film pictures must present a slow moving if not dreary universe with a population scarcely awake.

Even since the war we have seen the country intersected with great arterial roads rendered necessary by increasing motor traffic. Additional tubes have been constructed and are under consideration. Electrification of local railways is an acknowledged necessity and one great suburban system has only recently been completed. Escalators must be provided to reduce the physical exertion of climbing stairs. Air travel has established itself with unlimited possibilities. Vast portions of earth have been covered by additional dwellings. Distances have been reduced in relation to time. We are even threatened with the possibility of radio vision. The industrial side of life is promised untold facilities in the form of electric power, and land sites hitherto beyond reasonable access are soaring in value beyond the wildest visions of bygone economists. With all these present signs of progress during a period of unparalleled taxation it is truly more than one picture can depict, and the lay mind questions the successful attainment of so many projects in the time at our disposal.

The population is being more and more scattered to the outskirts of our towns and the strain of physical endurance must be counter balanced. None of the innovations referred to offers so great a compensation as the telephone and in our view this service alone will enable the coming generation to adapt itself to the changed conditions.

It must not be thought that development studies are mere guesses worked out by the imposition of these daubs of colour on the canvass of life as it exists to-day. Unless, however, we have the faculty of imagination it is impossible to draw any sensible picture of the future from the grim material presented by mere statistics.

The officers engaged on a study are encouraged to bear in mind the actual existence of those facilities and extended developments which enquiries indicate as reasonably probable. If the mental capacity lends itself to the appreciation of the increasing potentialities for telephone development it is not surprising that a comparison of the estimates with present day progress is suggestive of a field ready for harvesting.

It is generally agreed that more could be done in certain districts to popularise the service, but it has to be admitted that many important factors stand in the way of our prophesies being fulfilled which cannot be overcome at will by any one individual or agency. When the trade conditions of the country improve almost every industry will benefit. Existing empty premises will be occupied; life will become more strenuous; recreation more imperative; facilities for communication more urgent, and the provision of telephone service at every point should then be available. Such are the anticipations and there are substantial grounds for the optimism displayed.

Particularly in London the economic rise in site and land values has led to the reconstruction of numberless buildings in readiness apparently for an influx of business far in excess of anything yet realised. It is inconceivable that so great an expenditure can be undertaken by various individuals and corporations without a sanguine belief in the power of the country to produce a remunerative return.

There is justification for the spending of public money on a national service in proportion to the needs of the community as expressed in the provision for its accommodation. It is to the end of spending this money wisely that a careful survey of all properties is periodically undertaken and an endeavour made to ascertain the relation between them and the growing demand for the telephone service.

At the same time recognition has to be given to the fact that the density of telephones to population places this country only tenth in the list, and it is clear that the advantages of the service have not been realised as we believe they will be. One reads of the millions of journeys made each day by public conveyances and when it is appreciated that many of these journeys are undertaken for the purpose of a talk at the end it is evident that the telephone does not play the important part in our existence that it can be made to.

Our forefathers probably lived with as much stress as we do but in a different way. Life is doubtless quicker now. We certainly get more out of it. The world used to be regarded as at our feet to conquer by travel. It is now at our eyes and ears for interchange of thought and mutual understanding. We cannot avoid the changes. We must adapt ourselves to the new conditions and make use of the facilities available to minimise the friction which progress creates.

There are signs that the telephone is being valued more highly in so much as the increase in numbers is now about three times what it was before the War and we look forward to the growth being three times greater still before another twenty years have elapsed. This does not mean necessarily that we hope to have nine telephones where only one existed before the War but that there will be nine points of communication for each one which existed previously, that is, the facility will be brought within reach of every person in need of it. This is no idle phantasy as it has been accomplished in another part of the world in much less time and with continual pressure and propaganda it should be possible here. Our people as a whole are conservative in their outlook, and this has kept telephone development back in the past, but a change is taking place which will without doubt be reflected in telephone growth for which provision must be made if chaos and criticism is to be avoided.

G. E. N.

FOR OUR ADVERTISERS.

Contracts Open.—Melbourne, June 18– Supply of switchboard cable. Contract C. 427, Ref. B.X. 228. New Zealand Posts and Telegraphs, June 18—Supply of telephone cords (No. P. & T. 151.1425), Ref. B.X. 5251. P.M.G., Melbourne, June 25—Supply protected type telephone cable terminal boxes (Schedule C. 430), Ref. B.X. 5231. S. African Posts and Telegraphs, June 27—Automatic wall and table pattern 'phones (Tender No. 158), Ref. B.X. 5273. Applications to Department Overseas Trade, quoting references.

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THE AMERICAN TELEGRAPH SYSTEMS.

By G. T. ARCHIBALD.

(*Continued from p.* 160.)

Testing and Regulating.—In both systems very efficient maintenance is a feature of the organisation. In the Western Union system balancing apparatus and relays for duplex sounder sets are located in the test room, from which all local circuits are led to the instrument room. This arrangement permits the use of a narrow instrument table and at the same time provides more space for the operator, and ensures efficient and economical maintenance as all circuit and relay adjustments are attended to by trained repeater attendants. Operators gain the attention of the repeater attendant by depressing a signal button in the sending lead of the set which operates a lamp at the relay position.

All testing and regulating is performed by the Wire Chiefs, Assistant Wire Chiefs (test board), Repeater Chiefs and Assistant Repeater Chiefs (repeaters, Morse balancing apparatus, &c.), Automatic and Printer Chiefs and Assistant Automatic and Printer Chiefs (multiplex and teleprinter).

All internal maintenance is proper to the traffic staff and not to the engineering or plant department. Mechanics are not allowed to enter the instrument rooms.

Automatic Chiefs and Printer Chiefs and their assistants are required to pay close attention to the apparatus under their control, to remedy faults which will yield to immediate treatment without removing the apparatus, and to nurse routes which may be interrupted by intermittent line faults.

Apparatus which cannot readily be repaired is at once removed to the workshop for attention by equipment maintainers, or mechanics, who are also controlled by the traffic staff. Any piece of apparatus which cannot be repaired locally is sent to a central apparatus shop and a new unit is requisitioned.

All apparatus is withdrawn at fixed intervals for inspection and overhaul. Phonic wheels are examined at intervals of six months, driving forks and distributor plates every two months and so on. Each channel unit is completely overhauled every two months.

Every fault is recorded and a complete life history of all apparatus is available.

Morse speakers are provided between the instrument room and test room in the proportion of one to every seven multiplex circuits in order that the attention of the Wire Chief may be gained without delay in the event of a line fault.

Assistant Automatic Chiefs are provided with benches and tools to enable them to effect minor repairs on the spot, there is liberal provision of spare apparatus, with the result that faulty apparatus on working circuits is a rarity.

Stability.—It would be useless to close one's eyes to the fact that apparatus stability leaves much to be desired in this country. How then does the American service compare with our own? We have all heard rumours of cast-iron stability, rumours which did not quite fit in with British ideas of machinery of American manufacture. We are always told that Americans build on Monday, install on Tuesday, and scrap on Wednesday, and that they simply cannot afford to put the best workmanship into their machines. I have come to the conclusion that such statements must be taken with a large pinch of salt.

The first man I tackled on the question of stability looked rather puzzled when asked how much time was lost weekly through apparatus faults. "None," he said. "We don't allow circuit stoppages unless the lines are not available. We don't normally lose more than five minutes a week on any circuit." All the evidence I could find during my stay in America tended to confirm that statement. It is, of course, obvious that the very high output figures regularly obtained, and about which I shall have a few words to say in a moment, would be impossible without almost cast-iron stability.

Competition may have some bearing on the matter, but the fact is that a very high standard of maintenance is essential if satisfactory operating is to be made possible, and I may say that one did not need to visit America to learn that lesson. It is what we have been seeking for the past four or five years. We have been hampered by want of suitable reserve apparatus, by the use of too many different types of apparatus, by the frequent changes in personnel which have lowered the general standard of efficiency, and by the absence of specialisation. I am glad to be able to say that steps are being taken in this country to allot spare apparatus more liberally, and to reduce the number of types of apparatus, whilst the question of stability is receiving consideration.

All Western Union multiplex circuits are worked continuously night and day except for a period of about twenty minutes in the early hours of the morning when relays are cleaned and set and brushes, &c., are attended to.

Branch offices with only one teleprinter circuit are provided with a reserve machine. This machine is tested each Monday but is not used unless the circuit machine is out of order.

Should a breakage occur or other serious trouble develop a mechanic is sent from the head office. Mechanics visit every small office once monthly to examine the apparatus, but the question of reducing the number of inspections from 12 to 6 per annum is now under consideration.

Operator Output.—In this country the staff and the administration have never been able to agree as to what constitutes a reasonable operator output. This unfortunate state of affairs started with the adoption of the old 24 average, when all our circuits were operated by Morse, and it has continued with the introduction of staffing standards following the development of machine telegraphs after the war.

Our American friends have been able to avoid the pitfalls of an average system by the simple expedient of placing the best qualified operators at the most heavily loaded routes, and by fixing the operator's pay according to the class of circuit he or she may be required to operate. The only change of occupation available for any operator is the change from sending to receiving, and *vice versa*.

With specialised operating and efficient apparatus and maintenance you have almost ideal working conditions. When, added to this, operators are carefully trained to observe the operating rules it would be surprising if excellent output figures were not a regular feature of the business.

I don't want to weary you with figures, and one typical case will suffice. At the Western Union Main Office in New York the average hourly output on multiplex circuits (for 24-hour day) during September last (including Sundays) was 49.9 unequated telegrams. The busy hour figures were, of course, considerably higher and as a matter of fact outputs of 80, 90 and 100 and upwards are registered during consecutive hours at the most heavily-loaded circuits.

There you see the benefit of specialisation and efficient apparatus, and I feel absolutely certain that given similar conditions we could obtain in this country equally good if not better results in the busy hours. We could not expect the same high averages throughout the day because we have no deferred traffic to fill up line time.

Monitorial Duties.—The work of each operator is checked from time to time in order to test the quality of his work, and the results of these observations are taken into account in determining operating positions and salaries.

The work of Morse operators is observed by an operator who listens in in parallel with an "Ediphone" connexion. The monitorial operator notes all operating irregularities and this record together with the ediphone record is then transferred to another position where the latter is checked for errors and speed.

The work of automatic operators is checked by re-running the operators' perforated slip in short circuit, that of teleprinter operators is checked from the home record and that of phonogram operators by listening-in.

All errors are brought to the notice of the Assistant Chief Operator in charge who deals with the operator concerned.

The original forms required for the purpose of the check are obtained on requisition from the finished check or filing section.

The records obtained from these observations indicate a very high standard of operating. At some offices the results of the best operators are displayed on a blackboard; a large number of cases were brought to my notice where operators had perforated from 60 to 80 telegrams with a single mistouch error, or irregular operating signal.

Quality of Service.—The quality of service has been much improved in recent years, and efforts are now made to dispose of all fully-paid traffic within 5 minutes. Deferred traffic is usually handled in from 15 to 20 minutes; the maximum delay allowed on such traffic is one hour.

Fully-paid "X" telegrams, i.e., telegrams relating to the buying and selling of stocks and shares, cotton, wheat, &c., dealt with at Stock and other Commercial Exchanges, are handled on a no-delay basis, special arrangements being made for the rapid circulation of this traffic from point to point by hand.

Similarly, "RX" telegrams, i.e., telegrams dealing with the sale and purchase of fruit, vegetables and all other perishable goods, banking business, death and sickness are given as nearly a no-delay service as conditions permit.

Government messages have precedence over all other traffic.

At the larger offices where collection is made by belt conveyors, the office drag averages about 2 minutes, notwithstanding the fact that much of the work circulates from one floor to another.

From time to time a spot check is made of the traffic in order to test the speed of service. In some cases the information is obtained from the forms examined at the monitorial positions, and in others from a bundle of traffic selected indiscriminately. The speed of service is now so good that a monthly check is deemed to be sufficient.

In order to reduce delay to a minimum an arrangement is in operation whereby all offices within a given zone report hourly the number of telegrams on hand and the delay to a "Despatcher" at certain of the larger offices. This officer, who is responsible to the Vice-President, Traffic, and not to the officer in charge at the office in which he is located, controls all lines and the movement of traffic at all points within his zone. If delay arises on one route he may order the diversion of traffic or the opening of another circuit between the offices concerned. Special speaker wires are provided in order that prompt action may be taken.

Press Traffic.—American newspapers receive large quantities of Press work mainly over private wires leased from the American Telephone and Telegraph Company and the two telegraph companies. The Western Union

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Company provides excellent facilities for special events such as important political speeches, base-ball and football matches and race meetings. Special circuits are provided between sports grounds and the newspaper offices, these lines are provided free of charge, the company charging only the usual Press tariff. The apparatus is generally fitted at the front of the Press box. A reporter sits alongside his particular circuit, either writes or types his matter, and in some cases dictates it to the operator, who, of course, uses a semi-automatic key and the Phillips code.

During the presidential campaign the companies' representatives travel with the candidates' retinue in order to ascertain the amount of work to be handed in day by day and each office is advised, in advance, of the probable number of words.

Delivery.—Delivery is a serious problem for both companies. Boys are difficult to obtain in the larger towns and do not as a rule remain in the service for more than a few months. The Western Union Company attract boys by stating that messenger employment brings them into contact with other employers and therefore widens the possibility of obtaining suitable permanent employment.

In the Western Union Service boys are required to pay about 40 cents a week for the hire of uniform, except at New York and Chicago. Boots and cycles are supplied to them at cost price, on hire purchase terms. Each boy changes into uniform before taking up duty and into mufti at the end of the day. A clean uniform is provided fortnightly, and all recovered clothing is stored, cleaned and pressed before re-issue. Shower baths and dressing cubicles are provided for the boys. Motor-cars and motor-cycles are used for delivery to outlying places, the special messengers employed providing their own machines.

At one time a flat-rate weekly wage was paid for all delivery work but recently both companies adopted a journey rate for delivery and collection at offices where two or more boys are employed. There are two systems (1) the per message system and (2) the route system. In the former case, which applies only at offices in skyscrapers and where three or more messengers are employed, there is a flat-rate payment. In the latter case the payment depends upon the time occupied per journey. This is a kind of walk delivery system.

Messengers are assigned to particular routes in order that they become thoroughly acquainted with the topography of the neighbourhood. Specialisation again.

Telegrams are batched and sent out within five minutes of receipt at the delivery system. There are more delivery offices within a given area in a large city in America than in England and although the average distance covered per journey by a messenger is lower in the former case the number of telegrams delivered per journey is greater.

At railway station offices the means and time of delivery depend upon local conditions.

Phonogram Rooms and Equipment.—Considering the heavy traffic dealt with it is surprising to find how small a part telephone working plays in the American telegraph organism so far as the public is concerned.

In New York only about 300,000 of the 9,500,000 telegrams handled monthly are disposed of by telephone to and from subscribers and 600,000 branch office and private wire telegrams are similarly dealt with. This is probably due to the facilities which I described earlier on whereby a telegraph user is enabled to signal for a messenger to collect his traffic. Public traffic over telephone circuits is, however, increasing, but on the other hand branch office circuits are gradually being converted to teleprinter working.

The phonogram equipment calls for no special mention.

Phonogram rooms at the largest cities are divided into three sections: (i) subscribers' telegrams, (ii) branch office telegrams and (iii) private wire telegrams. These rooms seemed to me to be much noisier than those in the large towns in Great Britain. In most cases attempts have been made to damp down the noise by the treatment of ceilings. I am very much afraid that similar conditions would be unacceptable to operators in this country. All reception is by typewriter, and foot switches are used for cutting out operators' transmitters.

The standard speed of answer of the Western Union Company is 6 seconds but the average at New York, Chicago, Philadelphia and Washington is said to be not more than 3 seconds; 18 seconds is regarded as the maximum delay allowable. An operator is employed at a key or controlling panel at the New York Office for the purpose of seeing that calls are taken up as nearly as possible in sequence; if a particular call appears to have been neglected she operates a flashing signal by pressing a button associated with the calling lamp in order to direct attention to the call.

About one-tenth of the total traffic is dealt with in the peak hour 10 to 11 a.m. Operator output at the four cities visited averages over the 24 hours from 12 to 13 in the case of telephone subscribers' traffic, 17 to 18 in the case of private wire traffic, and 26 to 27 in the case of branch office traffic.

A subscriber on an exchange outside the city limit may dictate a telegram to a city office if he is prepared to pay the cost of the telephone connexion. In New York and Chicago business telegrams are not delivered by telephone in the business area unless there are exceptional circumstances. Outside that area attempts are made to deliver all telegrams by telephone except those dealing with illness or death.

At the largest offices operators do not count the number of words or time the telegrams. Band conveyors take the telegrams to a central point where the messages are checked, the number of chargeable words inserted, and the time and date printed by means of a Stromberg timing stamp. A record is kept of the number of telegrams each half-hour during the day.

Every operator keeps a record of the number of transactions dealt with throughout her period of duty.

No accounting work is performed in the phonogram room. At the close of each day the forms are sent to the book-keeping branch where charges are computed and accounts prepared. Accounts for telephone subscribers are normally rendered to the telephone company, not to the subscriber, but in some cases, and by special request, accounts are rendered direct to subscribers. A list of subscribers who are shy in the matter of payment of accounts is kept at each recording position and an operator is expected to consult the list before releasing a telegram.

The Postal Telegraph-Cable Company furnish a confirmatory copy of every telegram other than those of a social character, but the Western Union Company's practice is to supply copies only at the request of the addressee. A few requests are made for the delivery of confirmatory copies by messenger and these are complied with. A copy of a telegram sent out as confirmatory is made, on a duplicator, and retained in case of enquiry.

There is a story about a Democratic candidate at a recent presidential election, probably put into circulation by wicked Republicans. The candidate was dictating a telegram, the text of which read something like this "Send gun at once." The operator could not get "gun" and finally asked the sender to spell it. "G U N," he said. "G for Jesus, U for Europe, N for pneumonia."

Dining Rooms and Welfare Work.—The Western Union Company provide restaurants on the cafeteria principle at all offices where the preparation of food on the premises can be justified. The company's officials manage these restaurants and serve meals at a price just sufficient to show a margin of 1%. Automatic weighing machines, and others for the sale of pea nuts, chewing gum, &c., are a feature of all dining rooms. The prices charged in these well-managed concerns are much lower than those in force outside. The manageress of a restaurant is usually responsible for the entire staff employed and for the purchase of foodstuff and plant.

The Western Union Company employ a trained Welfare Matron at an office where 25 or more women are employed. She is responsible for the supervision of rest rooms, lockers, lavatories, &c., to see that blankets and other similar articles are available for emergencies, to maintain decorum outside the operating rooms and to advise young women on hygiene, &c. The matron at New York is helped by four assistant matrons.

An interesting feature of this work is that the matron holds a supply of ladies' hose for the use of women who desired a change on reaching the office on wet mornings. Their own hose is washed and dried ready for wear on leaving duty. This simple precaution is said to reduce sick leave due to colds, chills, &c.

Nurses are also employed at the larger offices. At New York there is a head nurse and three assistants. Two of the latter visit the homes of sick members of the staff. In every case when an officer advises absence on account of illness a nurse is at once sent to see whether she can render any assistance.

At about 20 offices a qualified medical man employed by the company attends twice weekly to examine members of the staff returning from sick leave. At other offices the staff are required to visit a doctor employed by the company before resuming after a serious illness.

Publicity and Advertisement.—Both companies make considerable use of attractive window display bills, "folders" and "stickers." In addition, canvassers maintain close touch with good customers and endeavour to attract new ones.

Newspaper advertisement is not considered to be worth while, but considerable use is made of "puff" paragraphs and pictures.

Leased Lines.—Both telegraph companies provide private wires or leased circuits, but the great bulk of this business is in the hands of the land lines department of the American Telephone and Telegraph Company. I believe about 2,000 such circuits are rented from this company. Leased circuits are obtained largely by the compositing and by the use of carrier waves above the voice range superposed on telephone circuits. Voice-frequency channels are also in use. The rental for leased circuits of all kinds is based on the shortest railroad distance between the towns concerned. The day (6 a.m. to 6 p.m.) and night (6 p.m. to 6 a.m.) rates are $24 and $12 per mile per year respectively. For 24 hours' service the charge is $36 per mile per year. Additional drop channels are charged for and use may be extended in the case of limited service at *pro rata* rates.

Demands for private wire circuits are dealt with in an amazingly short time, and the American Telephone and Telegraph Company maintains telegraph circuits between New York and its principal offices in order to facilitate correspondence. All urgent arrangements are made by telegraph and a private wire circuit can usually be provided in working order in a day or two.

Private wires are provided on the understanding that they shall be used only for the business of the renters who agree to refrain from accepting traffic from other persons and to act as telegraph companies. There is reason to believe that many renters contravene this agreement by dealing with other traffic to fill up line time, and American Telephone and Telegraph Company and the telegraph companies seem powerless to prevent the abuse.

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Conclusion.—Although there are indications that telegraph traffic is reaching if it has not already reached saturation point in America, the fact remains that the traffic has increased enormously since 1914. Traffic officers with whom I discussed this expressed themselves as satisfied that the main reason for the prosperity of the business is the fine service given between the large centres of population and industry.

I don't know whether we in this country, with our excellent postal system, have anything to learn from that. The American postal system is pretty bad and it has to be borne in mind that it takes 22 hours on the fastest train to travel from New York to Chicago and three days from New York to San Francisco. A fine telegraph service has therefore every chance of success.

American telegraph officials are not in any case prepared to see the traffic fall away without any attempt to stop the rot. One important official considers that the social use of telegrams has probably reached full development in the United States. It is significant, however, that he considers that the business use of the telegraph system is at a stage when the surface has hardly been scratched. He argues, and rightly I think, that so far the business telegram has been developed on a condensation of words which he regards as an intellectual barrier to the free use of the telegraph, and his aim is to cheapen the service to a degree which will induce people to send letters by telegraph instead of brief messages. That is why compositing, voice frequency and carrier wave systems and the telephoto process are about to be developed in America.

Another prominent official is anxious to develop the teleprinter exchange; his company is about to erect call boxes at strategic points in large cities for the use of the public who want to send telegrams.

Both believe that there are large numbers of people who want to use the telegraph and don't know it, and that lots of people use the post and the telephone who ought to use the telegraph.

There are no pessimists in the telegraph business in America; they don't wait for the traffic to come to them, they go out and seek it; they keep the business in the public eye and they are constantly on the look out for new uses to which the system can be put. The Western Union Company proposes to install 4,800 additional teleprinters on public circuits during the current year.

In this country the telegraph system has been a political shuttlecock ever since 1868. The Post Office is not allowed to fix its own tariffs and is subject to Treasury control. It is bound by statute to deal with all telegrams in the order in which they are handed in and has to attempt to give the same quality of service between London and any remote village dealing with one or two telegrams a day as is given between London and Manchester and other important business centres. It has to waste effort in that direction instead of concentrating its energies upon the task of encouraging business people to make more and more use of the service. In America the telegraph system is free from political influence, the companies are permitted to levy charges sufficient to ensure a reasonable profit, and each community gets a service corresponding more or less closely to the value of the business it gives to the companies.

Apart from the possibility of developing the "Greetings" telegram I don't think we can hope to increase our social traffic, but I do believe that we could attract more business traffic if we could be relieved of the statutory obligation to treat all telegrams with approximately equal celerity.

In a country like Great Britain where there is not the same need for telegraph service as in America, we cannot hope perhaps to quadruple our traffic. Nothing is more certain, however, than that we can encourage the public to make greater use of the service. In order to do this there must be whole-hearted co-operation between the administration and the staff, both sides looking all the factors squarely in the face. I believe the time is ripe for a greater measure of co-operation than has so far been possible, and if ultimately it proves that the American Commission has done something to make that possible it will not have laboured in vain.

PRIMROSE EXCHANGE.

THIS Exchange (at Kilburn, London, N.W.) originally an old church, has an interesting history.

It now accommodates a staff of sixty to seventy people, and is fitted up with all the equipment for an up-to-date manual exchange.

Its history begins in 1855, when a few gentlemen, members of different churches "took very eligible premises" in the neighbourhood capable of holding 200—300 people.

In 1858, the present site was secured for a new chapel (presumably the premises had proved inadequate) and the foundation stone was laid by the Lord Mayor on the 13th of October, 1858.

In 1859, the new chapel was opened, having seating accommodation for 800 people. The cost including the site was £3,070.

The first ordained woman minister was the Rev. Constance Coltman, Joint Pastor with her husband, in this church. She married couples with marriage service (in which the word "obey" was omitted) compiled by herself. The congregation was a flourishing one during her years of service, but later dwindled, and in after years this fine edifice was taken over by the L.T.S. as an Exchange for the District.

While negotiations were going on, Peter the Caretaker, truly the keeper of the keys, usually had to be dug out of a local resort, before anyone could gain access. His reminiscences are now somewhat vague as to names and dates, but he explained that "he had kept the place clean and tidy for eleven year, and the parsons were good men. Oh, yes; they often give him a shillin' and let no one see."

PRIMROSE EXCHANGE.

In the early days there was a persistent rumour that the church was haunted. Birds flew in and built their nests in the splendid hand carved rafters, doors opened quietly and then closed quietly, no one to be seen. It is said that at 7 o'clock every night the air grew cold and still and a nocturnal visitor walked down the Robing room stairs and into the Exchange. Once, in the middle of the night, a sudden and loud rapping made the solitary night telephonist leap to his feet. When his trembling body reached the door, there stood a truculent policeman, who fiercely demanded "what he was doing there, at this time of night."

Until quite recently tickets for soup and bread, and requests to see the Minister have been made by down and outs. Two elderly ladies called to say how pleased they were to see the place of worship had been opened again. They were not convinced of the change until they had a "peep in" and went away loudly protesting against such wickedness.

The odour of sanctity still clings, and we who believe in the ghosts of the past, like to think that their prayers and good intentions breathe their fragrance in our time.

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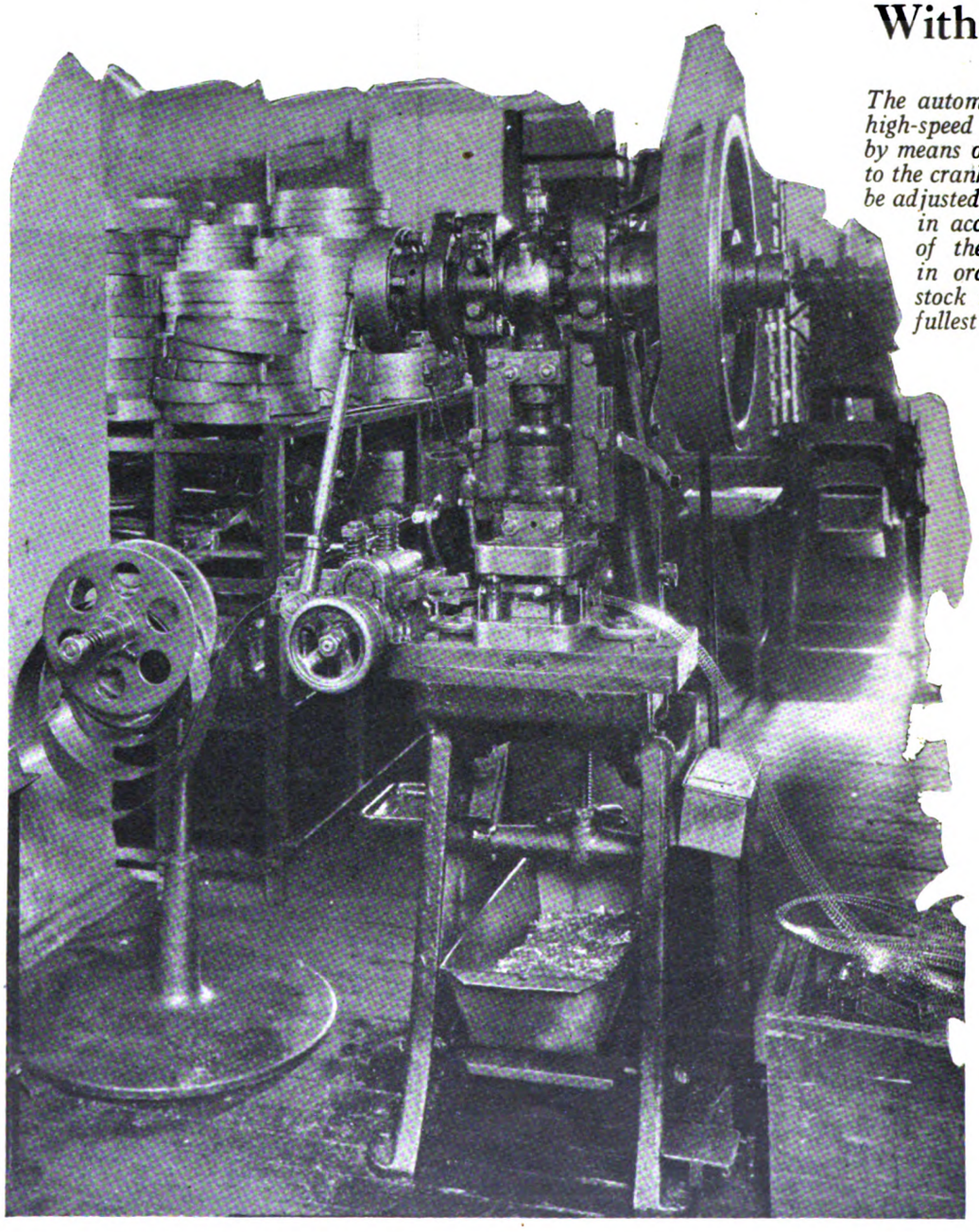
Maintaining Strowge

With Automat



The automatic push feed on t high-speed punch press is opera by means of an eccentric attac to the crank shaft. This feed be adjusted and the stroke chan in accordance with the s of the part being punch in order that every bit stock may be utilized to fullest extent.

STROWGER

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utomatic Supremacy—

gh-Speed Machinery

THE high-speed punch press shown in the illustration is not only one of the fastest of its kind, but is also entirely automatic in operation, except for the placing of new rolls of sheet brass in the feeding device. This particular machine punches out terminals used in banks, condensers, terminal blocks and cords at the rate of approximately 60,000 per hour, increasing the production of this article to almost seven times the former rate.

This is a typical example of the application of modern methods of high-speed production to the manufacturing processes throughout the factories of Automatic Electric Inc. It is significant in that it indicates a policy which, in the face of rising labour costs, is desirous of keeping Strowger Automatic telephone equipment available at reasonable cost, while still maintaining the high standard of quality in both material and construction that has been synonymous with the name Strowger for over thirty-five years.

[*This is one of a series of advertisements illustrating the exacting care exercised in the production of Strowger Automatic telephone equipment, which is thus kept constantly in advance of the telephone art.*]

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The
Telegraph and Telephone Journal.

PUBLISHED MONTHLY IN THE INTERESTS OF THE TELEGRAPH AND TELEPHONE SERVICE, UNDER THE PATRONAGE OF THE POSTMASTER-GENERAL.

Editing and Organising Committee - - - J. STUART JONES. W. D. SHARP. J. F. STIRLING. W. A. VALENTINE. J. W. WISSENDEN.

Managing Editor - - - W. H. GUNSTON.

NOTICES.

As the object of the JOURNAL *is the interchange of information on all subjects affecting the Telegraph and Telephone Service, the Managing Editor will be glad to consider contributions, and all communications together with photographs, diagrams, or other illustrations, should be addressed to him at the G.P.O. North, London, E.C.*1. *The Managing Editor will not be responsible for any manuscripts which he finds himself unable to use, but he will take the utmost care to return such manuscripts as promptly as possible. Photographs illustrating accepted articles will be returned if desired.*

VOL. XV. JUNE, 1929. No. 171.

WILLIAM ALEXANDER VALENTINE.

WITH Mr. Valentine's retirement the telephone service loses a conspicuous personality belonging to the now much diminished band of those who were in the telephone business almost from the outset and had, therefore, the opportunity and privilege which comes to pioneers alone of a personal share in shaping the main features of a service at the time when it is most plastic. Those whose energies and aspirations are necessarily limited to carrying on the torch, to extending the scope and improving the quality of a well-established system may perhaps be pardoned if, overlooking the failures and disappointments which invariably accompany first steps, they sometimes feel that pioneers have the more romantic and soul-satisfying task.

After earlier duties performed in the field and office, Mr. Valentine was made District Manager for Northern Scotland while still not 20 years old. He later held more than one responsible post in Manchester, and in 1898 was placed in charge of the Glasgow district, where strenuous competition between the Company and the Corporation long continued. Shortly after the transfer of the telephones to the Post Office, he left Glasgow to fill one of the Provincial Superintendentships at Headquarters. In 1916 he was appointed Deputy Controller of the London Telephone Service and, early in 1923, was made Controller on Mr Preston's retirement. His varied Provincial service and his duties at Headquarters equipped him with intimate and detailed knowledge of innumerable aspects of telephony and developed the sanity, balance, moderation and good sense which characterise him.

During his Deputy Controllership he had to handle difficult problems created by the war, and, when hostilities ceased, the conditions were, possibly, still more trying. The trade boom resulted in an enormous demand for telephone facilities, and the Post Office, having practised most conscientiously the policy of economy during the war, had not sufficient reserve plant to meet all demands, and its manufacturers, having plenty of orders from all quarters, could quote only long delivery dates. So completely have difficulties of this type been conquered that during the past two years Mr. Valentine has not had to refuse a single order. The number of subscribers in the London area is now over two and a half times as great as when he joined the London Telephone Service, and during his Controllership more than a quarter of a million telephones have been added. During the same time London's vast Toll service has been established and the Trunk service improved out of all recognition as regards transmission quality and reduction of delay, while its range has been extended to practically all Europe outside Russia and the Balkans, and, by means of the transatlantic service, to almost the whole of North America, so that subscribers in Great Britain can now speak to approximately 90% of the telephone subscribers of the globe. Mention must also be made of the successful start with the stupendous task of converting London to automatic working. This brief summary of the immense strides made during Mr. Valentine's tenure of office in the L.T.S. may seem somewhat superfluous to those in constant touch with telephone developments, but no adequate tribute can be paid to any captain of industry without concrete reference to the changes in complexity and scale of operations in the department under his charge, and in acknowledging Mr. Valentine's personal share in these great developments, we do not for one moment overlook the fact that many others, both inside and outside the London Telephone Service, have also had a big part in them.

Mr. Valentine's personal qualities include courtesy of a most attractive type, blade-straightness, high-mindedness, insight, sympathy, general kindliness and a desire to help others. He has always manifested marked fairness and extreme consideration for the ways and views of others, whether members of his staff or of the general public. His patience and serenity when confronted by uninformed or even unjust criticism have been the more remarkable because he has keen sensibilities. Possessed of a lofty sense of duty to the public, he has ever endeavoured not only to ensure service of a high grade to all subscribers but also, so far as was humanly possible, to remove every occasion for misunderstanding or suspicion. He has had notable opportunities to demonstrate this side of his character in connexion with the revision of rates in 1921 and the introduction of automatic working more recently.

Notwithstanding depreciation of the Civil Servant sometimes found in the Press, the Public in its more generous and, may we hope, more just moods, regards the typical public servant as equipped with wide knowledge of his work, self-restrained and imperturbable in the face of unfair criticism, impartial, devoted to duty treated strictly as a trust, subordinating self to the public need and free from ignoble concern for personal advantage. Mr. Valentine has come very near to the ideal in all these respects.

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His courtesy, good-will, sympathy and consideration have made him popular with his staff and established him in their regard and respect, and he, on his part, has left no stone unturned to further every claim which he could conscientiously put forward in their interest. He has ever endeavoured to find the good in his fellow creatures before commencing to look for anything else. Indeed, his kindness of heart might occasionally have been criticised by a sterner disciplinarian if the method followed were not justified in the result. He has keenly interested himself in welfare work and in staff social activities, often at great sacrifice of his own leisure. How successful he has been in commanding regard may perhaps be illustrated by the avowal of a candidate before a Selection Board that, having served under Mr. Valentine in his earlier days, he had ever since endeavoured to follow his example as the ideal. It is surely given to few Civil Servants to be hero-worshipped.

Mr. Valentine's whole outlook on life and the peculiarly high standard by which he has regulated and maintained his relations with humanity, have been based neither on social convention nor on philosophical expediency, but on a strong sense of the fundamental importance of things moral and the possession of deep spiritual convictions.

Mr. Valentine has rendered considerable service on Committees and Societies, and special mention should perhaps be made of the fact that he has served on the Editing and Organising Committee of this journal for ten years and has acted as Chairman for the past two years.

Mr. Valentine has had the wisdom and strength of mind to retire while he is still physically and mentally vigorous and can anticipate many years of health and happiness in the less exacting activities and interests open to one no longer in the daily grip of the onerous official responsibilities, and all who know him will join in wishing that he may long live to enjoy the occupations to which he may devote himself.

F. H. S. G.

TELEGRAPH TOPICS.

"TELEGRAPHIC Memorabilia" have been a monthly feature of this Journal ever since the Journal began, and we are fortunate in the fact that Mr. Tyrrell, who wrote them in 1914, still writes them to-day. Since that time the scope of telegraph science has expanded incredibly: wireless, then in its infancy, has established its place not only as a reliable means of telegraphic communication but in the homes of hundreds of thousands of people who have never heard of Hughes or Baudot. Simultaneously, the landlines and cables have made great strides: phantom circuits are superposed on physical circuits and the oceans are spanned by loaded cables. No less has been the development in methods of transmission: facsimile-transmission and television are already accomplished facts.

Naturally and properly, as knowledge grew, "Telegraphic Memorabilia," trying to keep pace with it, grew longer and longer: and for several years past pressure of space has compelled us most reluctantly to relegate it to small type. We hope in future to print it in ordinary type, and thus to restore to it the prominence that it deserves. At the same time the "Memorabilia" themselves will be condensed into a few short paragraphs of current interest to telegraph men and women, giving up all attempt to be comprehensive. In future, the products of our contributor's painstaking research will be expressed not only (nor even mainly) in the "Memorabilia," but in articles which we hope to receive from him monthly that will summarize recent scientific developments on telegraph subjects.

We make the change with some reluctance. We know that we are losing much; we hope that we are gaining more. The change is only provisional. Our aim and that of our contributors is to keep our readers informed of the progress of telegraphy throughout the world; and whether the change serves this purpose better or worse, only our readers can judge. We should be very grateful to receive their views, whether for publication or not.

TO OUR LOCAL CONTRIBUTORS.

WE should like to draw the attention of our contributors, and more especially of those contributors who send us in items of staff news and local notes, to one or two points. The first is that such notes should be received by the Editor not later than the 20th of the month, and the second is that the Telephonists' column ("Talk of Many Things") is not intended, and never was intended, to be confined to the doings of London Telephonists. The Editress of that column would welcome contributions from operators and notes of interest to operators all over the country. We should also welcome, both for that column and for the illustration of other local notes, photographs of staff groups, staff sports, and staff functions, which we are always pleased to reproduce so far as our space permits.

CIVIL SERVICE ARTS MAGAZINE.

THE contents of the second issue of this publication display an excellent variety. No less than seventeen plays or comic operas are reviewed at some length. No doubt the harvest from the dramatic seed sown during the winter months by a multitude of Service Dramatic Societies is reaped in March and April, but this record is nevertheless a striking testimony of the strong bent of large numbers of civil servants towards the drama. There is a good and discriminating review of the Civil Service Arts Council Exhibition of Arts by Captain Dalman, and a further article of great interest to art-lovers, by Dr. Anne Brougham on the Modern Outlook on Art. Mr. Ronald Oakeshott furnishes Some Notes on Novels and Novelists in which he seems to enunciate that "form"—in its narrow sense—is rare amongst "classic" novelists, says: "I think the 'form' of second rate books might show a higher average of excellence." Provided that "form" is used in quite its narrowest sense, we shall not quarrel with this dictum—provided, too, that "second rate" includes all those delightful authors of definitely high quality, whose rank as "classics" is not quite assured. This again is a point that the devotees of such authors will hotly contest.

We are asked to announce that copies of the magazine (7d. post free) may be obtained from Room 208, Treasury Chambers, Whitehall, S.W.1.

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HIC ET UBIQUE.

WITH the retirement of Mr. W. A. Valentine from the service the Editing Committee loses a valued colleague whose assistance it has enjoyed since 1919, and who has presided over its deliberations since Mr. Lee's retirement two years ago. We wish him the best of health to enjoy his well-earned leisure. His place on the Committee will be filled by Lieut.-Col. A. A. Jayne, D.S.O., O.B.E., M.C., who has been an occasional contributor to the *Journal* almost since its inception. Col. Jayne will be the first representative of the provincial staff to serve on the Committee, and he is a particularly welcome addition to our number.

Mr. Valentine will be succeeded as Controller of the London Telephone Service by Mr. W. H. U. Napier, to whom we offer our cordial congratulations. A portrait and biographical sketch of Mr. Napier appeared in our November (1924) issue.

An official report of the French Post Office shows that the ten largest towns in France had the following telephone development at the end of 1927: Paris, 1 station to 9 inhabitants; Marseilles, 1 to 31; Lyons, 1 to 26; Bordeaux, 1 to 18; Lille, 1 to 16; St. Etienne, 1 to 45; Nantes, 1 to 34; Nice, 1 to 18; Toulouse, 1 to 39; and Strasbourg, 1 to 14. In order of merit, the ten best-developed towns were: Biarritz, 1 to 8; Vichy, 1 to 8; Paris, 1 to 9; Cannes, 1 to 10; Dunkerque, 1 to 14; Strasbourg, 1 to 14; Lille, 1 to 16; Compiègne, 1 to 18; Nice, 1 to 18; Tourcoing, 1 to 18. These figures reveal a curious inequality in France's telephone development, for while that country has a total development of only 1 telephone to 46 inhabitants, as against Great Britain's 1 to 22.4, Paris has a slightly higher development than London, while Vichy and Biarritz are certainly ahead of any British pleasure resort.

French telephone engineers, it is announced (says a paragraph in the Press), are engaged on a survey of the Syrian telephone system with a view of adapting it to work in connexion with the system introduced into Palestine during the British occupation. This adaptation, which when complete will provide communication between Egypt and Syria via Palestine, will form an important link in the future London-Egypt line. The General Post Office has already reported successful test conversations between London and Bucharest. The completion of the Syria-Egypt line will practically leave only Turkey in Asia to be brought up-to-date to make the through connexion.

The prospect of a Europe-Asia-Africa circuit affording communication between London and Cairo might arouse the fairest hopes in the telephone enthusiast, if its achievement did not lie so far in the future. The London-Bucharest service is by no means a *fait accompli*; nor is the provision of the link between Bucharest and Constantinople a light matter; and as regards a trunk route across Asia Minor, we refer our readers to the article which appeared in our August, 1928, issue, in which this formidable task was discussed. We like to keep a prophetic eye on the future achievements of telephony, but we imagine that communication with Cairo is likely to be obtained by a wireless link before an overland (and submarine) route is built throughout.

Referring to a headline in an evening paper, "Night Telephone Delays Anger," *Punch* comments: "We doubt it." This is a good example of the entirely meaningless language used in headlines. They are often quite unintelligible until the paragraph to which they refer is read. An equally good specimen was one we noticed in an American telephone journal some years ago. It ran: "Telephone Kicks Prostrate Operator." One had visions of a fatigued operator lying prone on the floor and of a demonic telephone leaping from its shelf to kick its helpless victim. On reading the paragraph, however, one found that "kicks" (= complaints) turned out to be a noun and "prostrate" a verb.

Telephony, of Chicago, in its issue of April 27, pays a high tribute to British telephone development and to the excellence of our service. It remarks that the British rate of growth is 7.8%, as against the rate of growth in the United States of 4.4%. It is, of course, only to be expected that in a country with so dense a telephone development as the United States the rate of growth should be no higher than it is. Five office buildings alone in New York City have 19,200 telephones between them—a higher number than many a celebrated European city possesses, and the Equitable Building (New York) is said to possess more telephones than the whole of Greece. Still the Americans are not satisfied. They scout the idea of having reached saturation point yet, and clamour for an equally high development in other office blocks!

According to the *Electric Review*, a radio-telephone service between Germany and Siam was inaugurated on April 26. The service is conducted from the Nauen wireless station on a wavelength of 16.9 metres, the distance being some 5,300 miles.

W. A. VALENTINE—AN APPRECIATION.

"WHEN men are rightly occupied their amusements grow out of their work as the colour petals out of a fruitful flower." Thus Ruskin expressed picturesquely the truth stated in more prozaic terms by Hazlitt when he wrote "We must be doing something to be happy."

It is the keynote to interest in life for many business men, including the subject of these notes.

Time is remorseless in its progress. Unless one remembered it from actual experience it would be difficult to realise that when W. A. Valentine entered the telephone service earth circuit exchange lines were current practice, central battery exchanges were unknown, multiple switchboards were in their infancy and fitted at very few places, granular transmitters were a thing of the future, and paper-insulated dry-core cables were not yet invented.

Valentine was one of that now fast-dwindling band of devotees whom the National Telephone Company rallied to itself for the pioneer work in this country. Its managers were young men who were not encouraged to harass headquarters with their troubles. If there was work they were expected to do it; if there was difficulty they were expected to get over it. They did, and in return got small pay, a little credit, and no thanks. One general admonition was to spend as little money as possible, and therein we see the beginnings of that Scottish thrift long regarded as a sound principle in telephone management. They had to get their own wayleaves, fit their own instruments, clear their own faults (or at least a good many of each); they not only erected poles but bought them for erection, and when the unknown stared at them they improvised round it. They had perforce "to scorn delights and live laborious days" but had their reward in the fascination of their work, in experiences which fitted them for bigger things, and in that developed self-confidence which evolves naturally from such an apprenticeship.

It is no doubt true that environment is reflected in character but the converse is equally true in many cases. A man with the

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right qualities can create his own environment, and personality can rise superior to conditions. It is probably not putting it too high to say that from the time when he took charge of the opposition to the National Company's monopoly in Manchester, Valentine became better known than the post he filled and has since then been one of the outstanding figures in telephone circles in this country. On the conclusion of the Manchester episode he returned to an honoured place in the "National" fold, and by the National Company's former staff in particular he will be held in grateful remembrance for the part he played as Chairman of the Committee formed to guard staff interests in connexion with the transfer of the Company's business to the State.

Autocracy of any kind he had no liking for. In discussions with those who were his more immediate assistants he assiduously kept the mere official relationship in the background, and encouraged the free and frank expression of views. If anyone had ideas to contribute to the common stock these were welcomed. Even the appearance of being arbitrary was studiously avoided.

Naturally, therefore, he tried to make consultation with the staff a real thing, and earnestly wanted the Whitley machinery to work. While it was in operation it did accomplish something with not a little creaking of wheels, but the latter was inherent in the machine and did not arise because the lubricant of goodwill was lacking.

In his association with the staff, whether as individuals or deputations, at official meetings or social gatherings, there was never anything of the potentate or benevolent despot. Posturing was foreign to his nature. To be simple and unaffected involved no effort.

As there was nothing of the flamboyant or flashy in his own composition or outlook he disliked it in others. He retained his native Scottish caution as he did the northern accent and may have seemed difficult to move in consequence. His reasons, however, were not like the one given by the Scottish elder when asked why he disapproved of hymns being sung in church: "It is only hymns noo, but it'll be the Virgin Mary next." On the contrary, new ideas were never feared because they meant change of practice; they were received cordially provided they could be proved in.

He was one of the few Scotsmen who went back to the arid north after tasting the milk and honey in the rich pastures of the south, but it was a case of "*réculer pour mieux sauter*," for at the transfer he was brought to London from Glasgow to assist at headquarters with the reorganisation in the country.

Of his work in the London Telephone Service a better appraisal will be possible some little time hence. History has been made during his tenure, for it is no mean undertaking nor one which can escape the chronicler's pen, to commence the conversion of London's huge system from manual to mechanical switching. The trail is being blazed but the promised land is yet afar off.

The telephone service is still too young to have behind it great traditions but it does have a not unworthy record of public service efficiently done by men and women who have unselfishly put their duty to the public first. This may in time become a tradition and if so our colleague, to whom we tender this regretful *Vale* as he leaves the toils of office for the sweets of leisure, will by his example have made no mean contribution. He has filled a trying and responsible post with dignity and success.

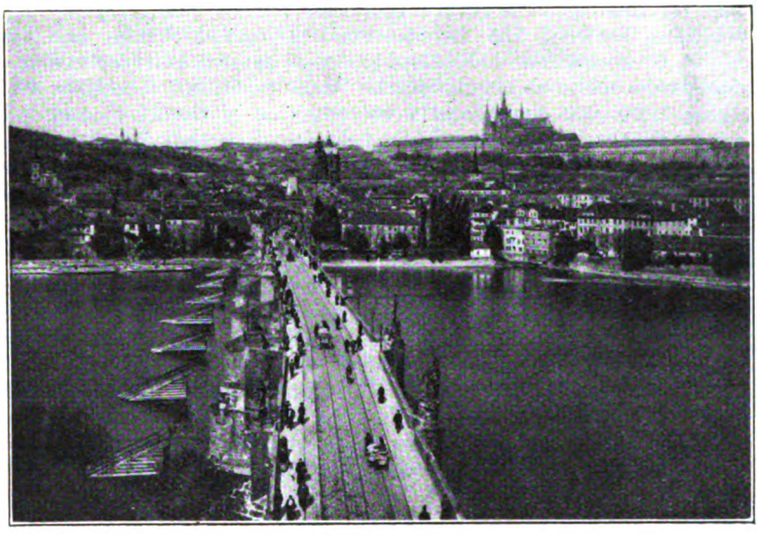
It may not be unfitting, nor a departure from that restraint which is seemly when writing of personal characteristics, to end on a note of praise for the invariable self-control which was a feature of all Valentine's dealings and intercourse with others. Never did it fail even under very great provocation. That is something to be proud of, for does not a wise old book tell us that "he who ruleth his own spirit is greater than he who taketh a city."

J. F. S.

THE PRAGUE CONFERENCE.

NEVER, surely, has an International Conference been held at so ancient and romantic a city to deal with so modern yet romantic a subject as the Conference recently held at Prague on the allocation of wave lengths to the broadcasting stations of Europe. For ten days—from the 4th to the 13th April—the Conference met in a room at Prague, as in a watch tower in the very centre of Europe, and, like an international "policeman of the ether," tried to mark out aerial channels and to regulate the ever-swelling tide of broadcasting traffic.

Reduced to its simplest terms, the problem which the Conference had to solve was "How to get a quart into a pint pot." This is indeed the age-long problem of all traffic experts and must have worried the committee which Noah presumably appointed to design the Ark.



Although wireless has existed only a few years it has developed so rapidly and for so many different types of service that the ether has already become as congested as the Strand. The Washington Conference of 1927 tackled this problem and tried to establish international order. It succeeded in dividing up the available wavelengths among the various classes of services—point-to-point, ship and shore, broadcasting, etc.—but it did not attempt to allocate wavelengths to countries or to individual stations.

During the last few years broadcasting stations have sprung up like mushrooms in every country in Europe, and as the wavebands available for them are limited it is not surprising that they have interfered seriously with one another. Largely owing to the initiative of the B.B.C., an international organisation of broadcasting concerns, known as the Union Internationale de Radiophonie, was established in 1925 and has done much useful work in connection with wavelengths, exchange of programmes, copyright and other broadcasting problems. The Union drew up a wave-length scheme known as the "Plan de Genève" and later a "Plan de Bruxelles"; but although each of these schemes effected some improvement, they lacked Governmental authority and were disregarded in many countries.

At Prague for the first time the European Governments took over the problem and shouldered the responsibility of allocating wavelengths to individual broadcasting stations in Europe. The British delegates were Mr. Phillips and Col. Lee. In addition, Capt. Eckersley and Mr. Hayes of the B.B.C. and Mr. Carr of the Air Ministry were attached to the British delegation as expert

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advisers. The Union Internationale de Radiophonie sent a delegation under Admiral Carpendale, the Controller of the B.B.C., who is President of the Union.

A number of other wireless questions were dealt with; but although they were interesting enough the main purpose of the Conference was the allocation of broadcasting wavelengths; and this question overshadowed all others. In accordance with the usual practice, the Conference set up several committees, which in turn set up sub-committees. It is difficult for a large meeting to settle details; and in one or two cases small sub-sub-committees were established. There is no limit to this process of reproduction, and had time permitted some tiny sub-sub-sub-committees would doubtless have emerged.

Bearing in mind the fact that there are not nearly enough wavelengths to go round, it speaks well for the spirit of the Conference that it eventually reached unanimous agreement on a revised allocation of wavelengths—which will be known as the "Plan de Prague"—and also on general measures for carrying out the Plan and for dealing with future proposals for its modification. The relations between the International Telegraph Union and the Union Internationale de Radiophonie were defined, and recommendations were made to regularise the whole position. The date 30th June, 1929, was fixed for the introduction of the Plan, and it is hoped that it will automatically take effect on that date in all the countries of Europe. The number of wavelengths allocated exclusively to Great Britain—namely one long and nine medium waves—remains unchanged, although there are slight changes in some of the wavelengths themselves.

At the closing banquet Capt. Eckersley and a little band of conspirators managed to smuggle into the room a large toy balloon with a strange looking attachment bearing in bold letters the title "Plan de Prague." This wonderful object was hidden beneath a table, and at an appropriate moment during the after dinner speeches it was allowed to emerge and to float gracefully into the air amid the cheers of the guests. Later in the evening it was released from a balcony and sent out on an unknown voyage over the city of Prague.

The organisation of the Conference was excellent. The Czecho-Slovakian Government took great interest in its work and did everything possible to make it a success. Their officials were exceedingly kind and took pleasure in showing their guests the wonderful buildings of Prague—steeped in historical associations—and the beauties of the surrounding country. The delegates had the honour of being presented to the distinguished President of the Republic, Mr. Masaryk, who lived in London for two years during the War and has many ties of friendship with this country.

It is perhaps hardly realised in Great Britain what a large and thriving city Prague is. Most people imagine it to be a charming old-world town, still living in the shadow of its romantic past. In reality it is a busy, up-to-date city with a romantic background—like a new jewel in an ancient setting.

Will the Plan de Prague prove worthy of its name? Will it be beneficent and durable, or will it prove faulty and short-lived? The answer to these questions will depend almost entirely on the manner in which the Plan is applied. The Protocol signed unanimously at Prague contains much good advice concerning the measures to be adopted to reduce the risk of interference. In particular, it emphasises the importance of every station keeping strictly to its proper wavelength. It is to be hoped that this advice will be followed and that the broadcasting organisations in every country will not only apply the new Plan but will apply it strictly, efficiently and loyally. If this is done, the difficulties hitherto experienced through interference between broadcasting stations will be much reduced, and the Prague Conference will have made a valuable contribution towards the settlement of European broadcasting problems.

F. W. P.

TELEPHOTOGRAPHY.

A FORECAST.

WITHIN the Service, one hears very little or nothing concerning the latest addition to telegraphic systems. Perhaps it is because we are jealous, but the day will come when an addressee will read his telegram and admire his correspondent's handwriting, or curse the latter's defective typewriter. We must, therefore, look for fresh laurels in a new direction.

Scientific history warns us that Telephotography for commercial purposes will be an accomplished fact in the not very distant future, so that with an eye to business and large traffic receipts, it is not too early to study its greatest attraction, which, to the public, is cheap, but efficient service.

It is understood that, under existing conditions, the efficiency of word transmission (or fac-simile) in the system under review, is greatly impaired by the least suspicion of interruption, and that the cost depends upon the area of space occupied.

Now, it is submitted that these conditions can be improved, or rather, such faults be reduced to a minimum, and at the same time, space occupied can be greatly condensed.

Where a sender desires to transmit a message, a code of signs, or symbols, would replace the present method of condensation, such as, for instance, a triangle △ would represent the same phrase as might a ten-letter code word to be found in Bentleys, the A B C, or Liebers, or the Western Union. Perhaps an official code could be compiled on these lines.

It will be seen that if the charges will depend on area of space these symbols will occupy much less space than that taken up by hand or typewriting, and the distinctive shapes would practically be unlimited. Circles, stars, crescents, oblongs, squares, ovals, etc.; manufactured of suitable material, gummed on the back, coloured to assist in successful transmission (if necessary), and of a size sufficient for the purpose could be utilized in various positions to represent the present form of message.

In compiling the code-book, the various symbols in different positions would replace the present code words. A box containing the signs would be supplied to purchasers, and refills, when required, at a small cost.

Maybe, the idea will prove impracticable, but on the other hand, it may provide a basis for profitable research, and the writer will then know that his ink has not been wasted; for many pieces of valuable machinery operating to-day have sprung from a very crude birth.

W. T. LOWE (*Inland Telegraphs*).

[*Note.*—We congratulate Mr. Lowe on the interesting possibilities that he opens up. At the beginning of history picture-symbols were gradually transformed into letters; telegraphists may live to see the reversal of this age-long process. As a modern letter-code purports to afford some 17,000,000,000 combination, the task of devising a symbol-code to take its place would not be altogether easy. Perhaps the solution may lie in some sort of combination of letters and symbols, either in the form of shorthand, or with symbols and letters combined together in the same telegram. We should like to hear our readers' views on the question.—*Editor*, TELEGRAPH AND TELEPHONE JOURNAL.]

CORRESPONDENCE.

TO THE EDITOR OF "THE TELEGRAPH AND TELEPHONE JOURNAL."

Dear Sir,—"Small Office," referring to the cost of delivering telegrams, submits a scheme which he asserts is bound to come sooner or later. If we are to increase our traffic receipts, I rather doubt this sweeping statement.

Your correspondent appears to forget—if he will excuse my saying so—that in the first place all members of the public, telephone subscribers or not, are our potential customers, and that improving the service would not be of much avail without at least regaining the traffic which we have lost. He says—*compel* all subscribers to receive telegrams by telephone! Whoever heard of a tradesman compelling his customers, or likely customers, to do his bidding? And, using the most discreet methods in the world,

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one cannot deny the fact that this is officialdom in its worst form. Isn't that what we are trying to get away from ? By all means let us give the system prominence in our publicity campaign, but any suggestion of coercion or force would surely be disastrous.

Our colleague can surely know very little of business when he advocates the following :—

> Appoint subscriber agents within well defined areas paying them a fee for delivery. These subscriber agents would pay the usual rentals for business or private installations, and be credited with the delivery fees in the accounts.
>
> In outlying districts when the cost of delivery is heaviest, make it a condition in the contract that the nearest subscriber to the address must undertake to deliver telegrams.
>
> Such subscribers to be charged a modified rental and paid delivery fees.

We will suppose that a small tradesman is a subscriber, and has been ordered (!) to take a telegram—the context of which refers to business—for his nearest trade rival, who deals in the same commodities, and who is not a subscriber . . . ! Or, are we to assume that the contract will also contain a repetition of the rules regarding secrecy as they affect the staff ?

Suppose a stockbroking, or any busy firm, are suddenly ordered (!) to take a message for the waitress at the tea-shop close by !

Imagine Lord FitzPomeroy dictating a telegram for the local blacksmith and being rewarded with a rebate of a few coppers off his account !

The Smiths, of Suburbia—who are on the telephone, have for years been trying to discover a family secret of their neighbours—the Browns—who are not on the 'phone—and are suddenly rewarded and convinced beyond all doubt. And so on, *ad infinitum*.

But I hope that my few words of friendly criticism will not deter " Small Office " from having another shot.—Yours faithfully,

W. T. L. (C.T.O.).

May 10.

BAUDOT MULTIPLEX PRINTING TELEGRAPH SYSTEM.

THE Automatic Telephone Manufacturing Co., Ltd., Strowger Works, Liverpool, have just issued an interesting pamphlet with excellent photographic illustrations and diagrams of the units of the Baudot multiplex system as manufactured by them. Brief and clear descriptions are given of the important modifications in the design of this apparatus which have been introduced by Messrs. L. Doignon.

The changes in design have been specially attractive to European traffic officers responsible for the disposal of large volumes of traffic, to whom the problem of working stability has always appeared so formidable. In so far as the problem resolves itself into the two large factors of the stability of lines and apparatus, the new equipment bids fair to offer a solution to many of the difficulties of the supervising and operating staff who have to rely in large measure upon Baudot installations. The improvements have led to very great simplification in the adjustments for setting and maintaining the apparatus in operation, and the progress in design is noteworthy.

In the distributor the Doignon-Mendonça speed governor, driven by a commercial motor, is utilised. In principle it departs entirely from those which have hitherto been employed for printing telegraphs. Experience has shown that the voltage of the driving motor can be varied by about 35% without affecting the speed, and the load of the driven machine can vary by as much as 100%, also without varying the speed. The speed of running of the governor is controlled by the turning of a single screw-head to right or to left, and by means of this simple governing device the speed may be varied to the extent of 30 revolutions a minute. In the British telegraph service, where a number of these machines have been tried at inland and Continental circuits, the simplicity, robustness and reliability of the governors have already established for them a good name.

The printer unit, which is of the Grunewald pattern, is controlled by impulses from the distributor, which are sent out by revolving commutators from a shaft projecting from the front of the plateau. This simple arrangement has rendered unnecessary the speed moderators of the receiving units, and in the new designs a five-tapper keyboard with a stout mechanical locking device has been fitted compactly in the base of the receiver.

An independent keyboard with electro-magnetic cadence and locking, and also the well-known retransmitter for regenerative circuits, are described and illustrated.

H. B.

LOCAL DIRECTORY INFORMATION.

THE importance of keeping exchange directory information up-to-date need not be stressed, and the procedure followed in order to achieve good results must receive careful consideration from all districts.

In the Liverpool districts the conditions aimed at may be stated as follows :—

1. The necessary changes should be entered in the interleaved directory as soon as possible.

2. Manuscript entries should be kept at a minimum ; brevity with clarity being the keynote, so that facilities exist which enable the monitorial staff to complete enquiries with despatch.

In an endeavour to fulfil these conditions, the system at Liverpool has recently been modified and a comparison of the new methods against the old may be of interest to readers of the JOURNAL.

Some time prior to the examination of the old conditions, the exchanges at which interleaved directories were in use had been reduced to four, *viz.* : Birkenhead, Central, St. Helen's and Warrington, these functioning as the directory centres for the Liverpool district. Each of the centres maintained an up-to-date directory covering the district as a whole, and with each centre was associated a selected group of exchanges, every exchange therefore having a ready means of enquiry over available junction circuits.

Typed lists of particulars extracted from completed advice notes were furnished to the directory centres by the District Office thrice weekly, supplemented by telephone advices of new lines.

The particulars contained in the typed lists included new lines, cessations, removals, changes of name, changes of telephone number. The compilation of this information occupied considerable time, and as the completed advice notes were received from the Sectional Engineer on alternate days only, the typed lists were not available at the directory centres for some days after the changes had been made.

It may be mentioned at this stage that an analysis of records taken at various times shows that from 60% to 80% of directory enquiries can be answered satisfactorily from the current printed list.

The modified system is as follows.

Immediately the engineering officer employed on work provided for by an advice note held at an exchange intimates that such work has been completed, the officer-in-charge advises her particular directory centre by telephone only ; keeping at the same time a special card record on the local enquiry position. The items telephoned exclude cessations.

The local card record, therefore, supplies the necessary information regarding changes in respect of any subscribers on the home exchange which, together with the cessations pegged on the multiple and noted in the ordinary exchange records enables relative enquiries to be readily answered without reference to the directory centre. This procedure, of course, materially reduces the number of telephone advices and shows a considerable saving of occupied time on the junction circuits.

At the directory centre, the particulars telephoned are recorded and entered in the interleaved directory, and are available to all other exchanges in the district if required, *e.g.*, if Anfield requires the number of Wallasey subscriber, telephone communication is established with Birkenhead, but if Wallasey requires an Anfield

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subscriber Liverpool Central is obtained, Wallasey being in the Birkenhead group and Anfield in the Liverpool Central group.

In dealing with an enquiry at an exchange, reference is first made to the printed list and the local card record. By this method all enquiries regarding a home subscriber are answered without recourse to the Directory centre, thus reducing to a minimum the use of junction circuits and monitor's time in respect of enquiries.

At the Directory centres the clerical work involved in the maintenance of the interleaved lists is restricted to information respecting their respective exchange groups and at these centres no local card record is required.

The modified scheme has worked smoothly and is considered to have accomplished the objects for which it was designed.

(1) New lines, etc., are entered immediately they are connected.

(2) No lists are prepared in the District Office.

(3) The majority of the enquiries can be satisfied even without recourse to the Directory centres.

(4) Clerical work at the Directory centres is limited to particulars relative to their respective groups.

The only additional work imposed is the maintenance local card record at each exchange other than a Directory centre, and even this is not all additional, as many of the Exchanges already kept an unofficial note of items which are now entered on the cards.

LONDON TELEPHONE SERVICE NOTES.

Contract Branch Notes.

THE business done by the Contract Branch during the month of April resulted in a net gain of 4,653 stations as compared with 4,143 stations in April last year. It is very gratifying to note the improvement in the April figures and we hope that the improvement has extended to the Provincial Districts, which seem to have suffered just as much, if not more than London, in the first three months of this year.

The development study of London indicated that there were scattered orders to be obtained in areas where there was a lot of small and relatively poor residential property where a Contract Officer would have to make a very large number of unproductive calls for each order obtained. Arrangements were made some months ago with the London Postal Service to deliver advertising literature to every house in a large number of roads in such areas, and the results have been so satisfactory that the area of operation is being extended very considerably.

The results obtained in this experiment and the fact that orders are still being obtained in goodly numbers from the enclosure of post-cards, advertising extensions with the quarterly accounts, has encouraged the preparation of a circular pointing out the value of service and extension points to be distributed broadcast to subscribers and non-subscribers in the City areas. We hope for good results from this experiment.

In discussing means of getting additional orders the other day I was handed the following extract from the *Pictorial Weekly* and told that it showed a sure way to increase the growth of the system ! ! !

"A Strange 'Phone Exchange."

"In north-western Nebraska there is a telephone exchange that is undoubtedly one of the strangest in the world. To a telephone company the sparsely populated area held out no promise of a service that would pay, and fifteen years ago one local resident decided to fix up one himself. Twelve ranchers agreed to have the telephone installed in their homes on the understanding that they were to have a month's service without charge, and the cost of a 'phone was fixed at £3 per year.

"The owner of the service reduces the bill when any of the subscribers have bad crops. And when a subscription is overdue, the defaulters are warned that unless they pay within two years their telephone will be cut off."

There has been, during the last two months, a phenomenal increase in the circulation of the JOURNAL in the Contract Branch. The sales for May amounted to 141 copies, which may be a record number amongst a staff of 266, and shows an increase of 99 over the sale sin March. The Western Contract Office which had the largest sale in March, still maintains that position and disposed of 45 copies in May amongst a staff of 57. The distributors in the various offices certainly deserve congratulations.

Our congratulations to the four District Contract Managers, Messrs. Rutter, Kellond, Brandreth and Livermore, on their promotion to the grade of staff officers and to Messrs. Elsey, Lewis and Pollard on their promotion to Contract Officers Class I.

* * * *

Cricket.—L.T.S.

The L.T.S. cricket season opened at Chiswick on Tuesday, May 7th, with a match against the Engineer in Chief's office. L.T.S. batted first on a good wicket and were rather cheaply disposed of for 95 runs. Widdup batted steadily for 20 runs and Oliver was undefeated with 19 runs. The Engineer in Chief's office obtained the runs for the loss of 5 wickets.

* * * *

Cricket.—Contract Branch.

It is recognised that the task of retaining the Shield which was wrested from the Accounts Branch last year is a formidable one but considerable optimism prevails amongst the team and although one or two players have been lost, several new men are expected to fill adequately the vacancies.

The results of the first three matches will be known by the time these notes are in print, the opening game being against the Accounts Branch on the 15th May, followed by a match against the Traffic Branch on the 21st May, and the Accounts Branch return match on the 27th May.

* * * *

Bowls.—L.T.S.

The season has opened auspiciously by two splendid victories gained against the Clearing House and Savings Bank.

The opening game against the Clearing House was played on the 2nd May and resulted in a win by 53 points to 50. It was a closely contested game with the Clearing House leading until the last quarter of the game.

The match against the Savings Bank was also won by the narrow margin of 9 points the final scores being 68—59.

Detailed results as follows :—

v. Clearing House 2nd May, 1929.

Rink 1.—Grove, King, Collins, Ragbourn.—Lost 16. 24.
Rink 2.—Hutchison, Evennett, Heard, Cleland.—Won 16. 14.
Rink 3.—Wilson, Dickinson, Gregory, Livermore.—Won 21. 12.

v. Savings Bank, 13th May, 1929.

Rink 1.—Wilson, Evennett, Heard, Cleland.—Won 22. 19.
Rink 2.—Hutchison, King, Collins, Livermore.—Won 21. 17.
Rink 3.—Mantle, Grove, Denment, Ragbourn.—Won 25. 23.

The programme of remaining matches in May and during the month of June is :—May 21st, *v.* Cavendish ; May 29th, *v.* Board of Education ; June 11th, *v.* Customs and Excise ; June 20th, *v.* L.P.S.

* * * *

Tennis.—L.T.S.

The Season commences with the first round for the "Agnes Cox" Cup which is to be played by the 1st June.

Entries have been received from 23 teams and the competition promises to be interesting.

In addition to this the Assistant Controller, Mr. M. C. Pink, has very kindly offered a Cup for a "Singles" competition. Each Exchange and Office Section were invited to nominate a representative player with the result that 24 entries have now been received. In this instance also the first round has to be played by the 1st June. The second round has to be finished by the 1st July, the third by the 1st August, and the semi-final by the 1st September. The date of the final will be announced later. These particulars refer to both competitions.

* * * *

Netball Competition.

The L.T.S. Netball Final for the Liddiard Shield was played at Chiswick on Saturday, May 4th, between the Controller's Office and Central Exchange. Miss Liddiard was present.

It proved to be a very interesting and exciting game for the onlookers, as can be seen by the result. The winning team was the Controller's Office who won by the narrow margin of one goal. Result 11—10.

A Knock-Out Tournament was also arranged, which was well supported. Eighteen L.T.S. clubs competed, the final being between Clerkenwell and Chiswick Exchanges, the first-named winning by seven goals to three.

The Liddiard Shield, medals and prizes were kindly presented by Miss Buchanan (Woman Establishment Officer of the Secretary's Office), whose presence was much appreciated.

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PROGRESS OF THE TELEPHONE SYSTEM.

THE following gives a brief review of the growth in the telephone system during the past financial year.

During the last month of the year, the total number of stations working in the Post Office system passed the one and three-quarter-million mark, the total number at Mar. 31 being 1,754,641. The net increase in stations for the year was 123,450.

The growth for the year in London, England and Wales (excluding London), Scotland and Northern Ireland was as follows :—

NUMBER OF STATIONS.

	At Mar. 31, 1928.	*At Mar.* 31, 1929.	*Increase.*	*Increase* %
London	578,322	626,714	48,392	8.4
England & Wales (excluding London) ...	883,435	948,934	65,499	7.4
Scotland	148,934	157,169	8,235	5.5
Northern Ireland ...	20,500	21,824	1,324	6.5
	1,631,191	1,754,641	123,450	7.6

Residence rate installations at Mar. 31, 1929 numbered 150,093 in London and 236,658 in the Provinces, the total of 386,751 representing an increase of 41,625, or 12.1% for the year. This compares with an increase of 26,637, or 4.4% in business exchange installations for the same period. The net increase in residence rate installations represented 61% of the total net increase in subscribers' exchange installations (i.e., business and residence combined) for the same period. Residence subscribers at Mar. 31 last represented 37.8% of the total exchange subscribers.

The number of Public Call Offices (including Kiosks) working at Mar. 31 last was 25,864, of which 5,599 were connected with London Exchanges and 20,265 with Provincial Exchanges. The net addition for the year was 1,810 (7.5%). Of the net increase of 1,810 Call Offices, 1,591 (88%) were Kiosk Call Offices, and at Mar. 31 last the Kiosks connected with London Exchanges numbered 1,273 and with Provincial Exchanges 5,005, giving a total of 6,278. Practically a quarter of the call offices now working are kiosks.

During the year ended Mar. 31, 1929, 126 new exchanges were opened under the Rural Development Scheme of 1922, bringing the total number of exchanges opened under the scheme up to 1,267. In addition to the 1,267 opened, there were at the end of March a further 79 in course of construction.

The total number of exchanges working at Mar. 31, 1929 was 4,476.

The number of rural-party line stations at the end of March last was 10,456, an increase of 241 or 2.4% on the total a year previously.

Further considerable progress was made during the year 1928-29 in connecting railway stations in rural areas with the public telephone system, largely as the result of the arrangements agreed upon with certain railway companies in regard to the provision of call office circuits. During the twelve months ended March last, 199 railway stations in rural areas were connected with the telephone system, bringing the total number connected up to 1,106. In 751 cases rented circuits have been provided, and in the remaining 355 call office circuits. The net addition in call office circuits during the past year was 135, as against a net increase of 64 in rented circuits.

At the time of going to press, the results for the last month of the year 1928-29 in respect of trunk calls were not available, and particulars of the year's traffic will be given in the next issue. Particulars of the February traffic, which have not yet been quoted, are as follows :—

The total number of inland calls dealt with was 8,476,900, representing an increase of 428,906, or 5.3% over the corresponding month of the previous year. (In Feb. 1928 there was, however, an extra day—leap year.) Outgoing international calls numbered 41,710 and incoming international calls 44,592, representing increases of 11,851 (39.7%) and 12,931 (40.8%) respectively, over Feb. 1928.

Further progress was made during the month of April with the development of the local exchange system. New exchanges opened included the following :—

LONDON—Upminster.

PROVINCES—Broadstairs ; Colchester, Southend-on-Sea Marine, Leigh-on-Sea, Hadleigh, Thorpe Bay, Rochford (all automatic) ; Collier Street, Rendham, Sinderby, Hampton (Cheshire) (all rural automatic),

and among the more important exchanges extended were :—

LONDON—Greenwich.

PROVINCES—Ascot, Bournemouth, Gateacre, Glasgow (Western), Lowestoft, Pendleton, Rickmansworth, Skipton, West Bromwich.

During the month the following additions to the main underground system were completed and brought into use :—

Box—Chippenham cable,

while 87 new overhead trunk circuits were completed, and 92 additional circuits were provided by means of spare wires in underground cables.

CIVIL SERVICE DRAMATIC SOCIETY.

ONE ACT PLAY COMPETITION.

OWING to the success which attended the One Act Play Competition in 1928, the Civil Service Dramatic Society has decided to hold a similar will be paid to detail and the competition organised on a more extensive scale.

Entry is open to the whole of the Civil Service, provided applicants become Acting Members of the Society. The entrance fee is 3/-, which will admit to the Final Competition and Dancing afterwards.

The date of the competition is dependent on the availability of a Hall, but it is hoped to hold it during the week commencing 23rd September.

Individual applications to take part in plays to be produced by the Civil Service Dramatic Society should be sent to Mr. P. W. Nash, 9, Palmers Road, East Sheen, S.W.14, by the 10th June.

Further details concerning the competition and the conditions of entry for Departmental Societies will be promulgated in due course.

OBITUARY : MR. W. DALTON, PRESTON.

IT is with the deepest regret that we have to record the passing of Mr. W. Dalton, Traffic Superintendent, Class 2, in the North-Western District, Preston. Mr. Dalton, who was only 42 years of age, was taken ill just before last Christmas, and although at one time hopes were entertained of his recovery, he grew gradually worse, and died on May 10. The interment took place at Penwortham on May 13, and practically the whole Traffic Staff, and various other members of the District Office Staff, were in attendance to pay a last tribute of respect to their late colleague.

There were also present representatives from the Surveyor's Office, Superintending Engineer's Office, Preston Post Office, and from the Chester and Liverpool District Manager's Offices.

In addition to the wreaths sent by the District Manager's Staff and by Mr. Dalton's intimate colleagues in that Department, there were also floral tributes from the Supervising and Telephone Staff of Westmorland and Cumberland, Head Postmaster and Telephone Staff Blackpool, Head Postmaster and Telephone Staff Barrow-in-Furness, Head Postmaster and Telephone Staff Blackburn, and from the Telephone Staff of Lancaster and Morecambe, and also from the Liverpool Traffic Staff.

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STAMFORD DRAMATIC SOCIETY.

THE first season of this Society, which is the Dramatic Society of the London Telephone Service, was brought to a successful close with two performances of "Tilly of Bloomsbury," by Ian Hay, at the Blackfriars Theatre on the 29th and 30th April last. It is just over twelve months since the Society was formed under the Presidency of our late Controller, W. A. Valentine, Esq., C.B.E., and their first play, "The Young Person in Pink" was, it will be remembered, very auspiciously staged last November. "Tilly of Bloomsbury" is a more ambitious undertaking, but the cast was equal to the occasion and the play was well received by most appreciative audiences which filled the house on both nights.

Richard Mainwaring, heir to the Mainwaring millions, becomes engaged to Tilly Welwyn, a girl in humble circumstances, shortly after a chance meeting on the top of a bus, and the course of their love through difficulties arising from their unequal station provides a story with a pleasing note of sentimentality and abounding with amusing situations. Miss F. Farey as "Tilly" completely won the hearts of the audience with her charming

TILLY OF BLOOMSBURY.

Dicky: "I WONDER—HAVE YOU EVER LOVED ANYONE BEFORE?"

naïveté, and had a handsome suitor in Mr. F. Crossley as "Dick." Mr. A. E. Messenger as "Stillbottle" gave an original and highly humorous characterisation of the cockney broker's man. The part of Mrs. Welwyn, Tilly's good-natured and devoted mother, was faithfully played by Miss I. Smith, while Mr. P. Smith as the father gave a dignified portrayal of the philosophical tippler once Fellow and Tutor of his college. Miss P. Lee was a sweet little "Amelia," and the part of Lady Mainwaring was taken by Miss E. Wilson with graceful austerity. Mr. H. G. Dean as "Abel," her ladyship's henpecked husband, added much to the enjoyment of the show. A light key was interduced by Mr. A. Strevens with his bright and breezy rendering of Perce, Tilly's self-assured brother. We must not omit mention of Miss V. Jeffrey as "Grandma Banks," and Mr. H. M. de Borde who took the part of "the Rev. Adrian Rylands." Both in their respective ways were extremely funny, and the loud applause accorded Mr. de Borde was a tribute to his version of the conventional comedy curate. Miss E. A. Hobdell (Sylvia), Miss V. Mc Kenzie (Connie), Mr. H. Clayton (Mehta Ram), and Mr. L. Craft, who doubled the roles of the Butler and of Mr. Pumpherston, all ably filled their respective parts. The play was produced by Mr. Andrews O. Buck, who merits the highest praise for the care and thought he gave to its production. An "all Service" orchestra under the able direction of Mr. J. Curr, A.C.V., provided tuneful incidental music.

Members of the Society may look back with satisfaction upon a most successful inaugural season, for which considerable credit must undoubtedly be given to their enthusiastic and capable Secretary, Miss Dorothy Coleman. We await with pleasure and confidence the production of further plays by this active Society during their next season.

A DEFENCE OF THE TELEGRAPHS.

AN analysis of the inland telegraphs position and prospects was given to the Manchester Rotary Club on Thursday by Mr. T. E. Herbert, assistant superintendent engineer (S. Lancs.).

"It is only fair to point out," he said, "that in the seventies and eighties, before the advent of the telephone, telegraphs were developed in such a way as to bring every village and hamlet within reach of their fellows. In times of urgent distress or necessity, who can possibly assign a money value to the lives saved or anguish mitigated? Then, too, the value in developing rural business interests must not be overlooked. But all this was philanthropic work recognised as such by Parliament, who time and time again extended the facilities. What the Press of the country owe to telegraphs can best be explained by telling you that 2d. is charged for extra copies of a 100-word message. This philanthropy of an earlier generation must have done much for the development of a cheap, reliable, and popular Press. To-day, the great newspapers have no need for any such privileges, but we may wonder whether a service at actual cost to the State might not embarrass some of the smaller papers."

What was the function of telegraphs with a highly developed telephone system? Mr. Herbert answered the question by a quotation from Mr. Donald Murray: "Telegraphs should be carrying much that goes in the mail bags. Speeding up business increases profits, and it ought to be profitable to the nation to expand the telegraph service by giving cheaper, better and quicker service." In America, many large concerns leased private telegraph wires, as did most of our newspapers here, connecting branches and factories. The discussion of business matters by telephone over long distances by this method was costly; and decisions taken or bargains made generally required written confirmation, for it must not be forgotten that mistakes were possible even when using the telephone. The value of the telegraph to the general community lay in the quick delivery of urgent messages from and to relatively remote places, the quick confirmation of urgent inquiries demanded by the ever-increasing stress of business operations, its value as an alternative in the event of telephone interruptions, and its strategic value in case of war.

The speaker dealt with the methods of operating telegraphs and showed that the newest infra-acoustic or sub-audio-telegraphy systems did away with the necessity for main telegraph cables altogether. The messages could be sent at high speed over the telephone cables without in any way affecting speech transmission. This system was superseding all others, but though it would vastly reduce the cost of telegraph plant, it would not solve the financial problem of the inland telegraphs. The very large amount of human labour necessary in transmission, reception and delivery of messages was the fundamental cause of this problem.

DEATH OF A FORMER JERSEY POSTMASTER.

WE regret to learn of the death of another of the old school in the person of Mr. Charles Fenton, a former well-known Assistant Superintendent at T.S. and T.N.S., which took place at his Shanklin residence on April 24, in his 75th year. Entering the old Electric and International Telegraph Company in 1868, the late Mr. Fenton was, in 1870, appointed to Southampton on the transfer of the telegraphs to the State, where he served nearly 4 years. Then, at the desire of the late Sir Henry Fischer, the then Controller of the C.T.O., he, with the late Messrs. R. D. Binsted, H. E. P. Gill, E. Parker, F. Preston, W. Waterman and others, was transferred to T.S. and placed in the Second Class of telegraph clerks. Mr. Fenton was subsequently appointed to the *Scotsman* (Edinburgh) special wire in Fleet Street, later becoming a First-Class Telegraphist, continuing there several years until his appointment as an Overseer and Senior Telegraphist in 1886, when he was recalled to T.S. He became a Second-Class Assistant-Superintendent in 1894 and was promoted to the First Class in 1902, then taking duty at the Stock Exchange and Threadneedle Street offices. In 1908 he became Postmaster of Jersey, and retired from that post on reaching the age limit in 1915, since which time he has resided in the Isle of Wight.

J. J. T.

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A BRIEF CHRONOLOGY FOR STUDENTS OF TELEGRAPHS, TELEPHONES AND POSTS.

By HARRY G. SELLARS.

(*Continued from page* 168.)

1880, June 26 ... F. A. Gower patented a telephone transmitter containing eight carbon pencils arranged in the form of a star.

1880, July 1 ... C. Moseley, W. F. Bottomley and W. E. Hayes patented a "twist" or "rotated" system for telephone wires.

Alexander Graham Bell made an Officer of the French Legion of Honour and awarded the "Volta Prix" of 50,000 francs. He also received the Albert Medal.

C. Williams, jun., of Boston, U.S.A., devised a sliding spring-peg telephone switchboard.

American Bell Telephone Company was formed and acquired the National Bell Telephone Company.

(Western Electric Company introduced a multiple system of wiring for telephone exchanges.

J. Poole published "The Practical Telephone Handbook."

McGregor devised a Call Register for telephone working.

Sandford Fleming, commenting on a suggested cable from Asia to America across the Pacific, urged that the American end should be on Canadian soil.

Edison introduced an electric lamp with a carbonised bamboo filament.

Swan exhibited to the Society of Telegraph Engineers an electric lamp with filaments of carbonised cotton. Edison and Swan formed a company to work their patents.

Creosoted telegraph poles erected between Fareham and Portsmouth in 1848-49 found to be in excellent condition.

1880, Nov. 22 ... Post Office Savings Bank commenced to purchase Government stock for depositors.

Paul la Cour, of Copenhagen, devised a plan for synchronised telegraph working, which included a "phonic wheel" for driving a distributor.

Faure constructed a form of electrical accumulator.

Postmaster General (Mr. Fawcett) introduced Post Office Savings Bank deposits by means of postage stamps affixed to forms, thereby enabling children to save penny by penny.

Postal Conference held in Paris with the object of establishing an international parcel post.

Charges for foreign telegrams ranged from 2½*d.* to 16*s.* 9*d.* a word.

1880, Dec. 13 ... Post Office proposed to proceed with negotiations for licensing telephone companies, who had contested the Postmaster-General's monopoly, and to establish Post Office exchanges in a "wide and comprehensive manner." The Treasury gave only restricted authority as regards the latter proposal.

1880, Dec. 20 ... Judgment given in favour of the Post Office claim that a telephone is a telegraph, and a telephone conversation is a telegram, within the meaning of section 4 of the Telegraph Act, 1869. Licences were thereupon taken out by companies for 31 years, the Department to have the right of purchase at the end of 10, 17 or 24 years. A five-mile radius limit for exchange areas was imposed.

1880, Dec. 22 ... W. Johnson patented a telephone transmitter containing two carbon pencils.

1881, Jan. 1 ... Postal Orders introduced in United Kingdom at values ranging from 1*s.* to 20*s.*, with poundage ½*d.*, 1*d.* or 2*d.*

Atlantic cable laid for Western Union Telegraph Company.

M. F. van Rysselberghe, of Brussels, installed his telemeteorograph between the Brussels Observatory and the meteorological station at Ostende.

At the Paris Universal Exhibition of Electricity, music was transmitted by means of microphones installed at the Opera House. Queen of the Belgians at Ostende was able to listen to the Opera at Brussels.

A. C. Brown, of the Eastern Telegraph Company, suggested an inductive method of communicating with moving trains.

1881, Jan. 7 ... Leroy B. Firman, of Chicago, patented a multiple telephone switching system.

London and Globe Telephone and Maintenance Company formed.

First dry-core cable laid at St. Louis.

National Bell Telephone Company, American Bell Telephone Company and Western Electric Manufacturing Company consolidated as the Western Electric Company. The American Bell Telephone Company retained control.

(F. Shaw, of the Law Telephone Company, New York, devised a "call wire" system by means of which all subscribers could communicate their requirements to the exchange operator, who listened continuously. J. D. Miller and J. J. Mann improved Shaw's "call wire" telephone system.)

1881, Mar. 10 ... National Telephone Company formed.

1881, Mar. 16 ... Joseph W. Swan addressed the Philosophical Society of Glasgow on his method of electric lighting by incandescent lamps.

Sir William Thomson's residence lighted electrically.

1881, May 14 ... W. R. Patterson, of U.S.A., patented a cable composed of jute- or cotton-covered wires with an insulation of gas-impregnated paraffin. Paper took the place of cotton subsequently.

Ader devised a telephone receiver with an almost circular magnet (which was employed by the Société Générale des Téléphones in France) and a telephone transmitter containing ten carbon pencils. The system was exhibited at the Paris Exposition.

International Congress of Electricians held in Paris. System of electrical units adopted universally.

Faure improved Planté's secondary cell by coating the lead plates with minium. Sellon and Volckmar also used minium.

Faure also coated the plates with lead oxide paste and Sir Joseph Swan introduced the pure lead lattice grid coated with paste.

(*To be continued.*)

C.T.O. NOTES.

Promotions.

Messrs. W. Hume and T. H. Brooks, Assistant Superintendents to Superintendents (L.G.); H. J. Jordan, F. R. White and E. R. Morton, Overseers to Assistant Superintendents; Mr. A. E. Millett, Overseer Provisional to Overseer; and Mr. P. S. Pamment, Telegraphist to Overseer Provisional.

Retirements.

Superintendent L.G.: Mr. C. W. Sparkes; Assistant Superintendents: Messrs. H. J. Archer, G. H. Clair; Overseers: Messrs. E. T. Lock, W. S. Read; Supervisor: Miss A. E. Gower; Assistant Supervisors: Misses M. E. Crowley, S. A. Purser, A. Bell; Telegraphists: Miss A. E. Powell, Messrs. W. F. G. Garland, H. Elliman.

Sports.

Preliminary Notice.—The "Centels" Annual Sports Meeting will be held at Chiswick on Friday, July 12.

"*Fortels*" *Sports Club Concert.*—A highly successful Smoking Concert of the Cable Room Sports Club, under the chairmanship of Commander E. L. C. Grattan, was held a short time back. An opportunity was taken during the evening to present the Club Trophies.

Music.

City of London Male Voice Choir.—The Choir held a successful Concert at the Sunday School Union. The concert was opened by an anthem sung in memory of the late Mr. John Lee, who was the Choir's President. Miss Tomchinsky, the young Russian violinist, delighted the audience with her playing. Mr. Leonard Salisbury and Mr. Kelmore Scott sang cleverly, and everyone appeared satisfied with "Our Choir."

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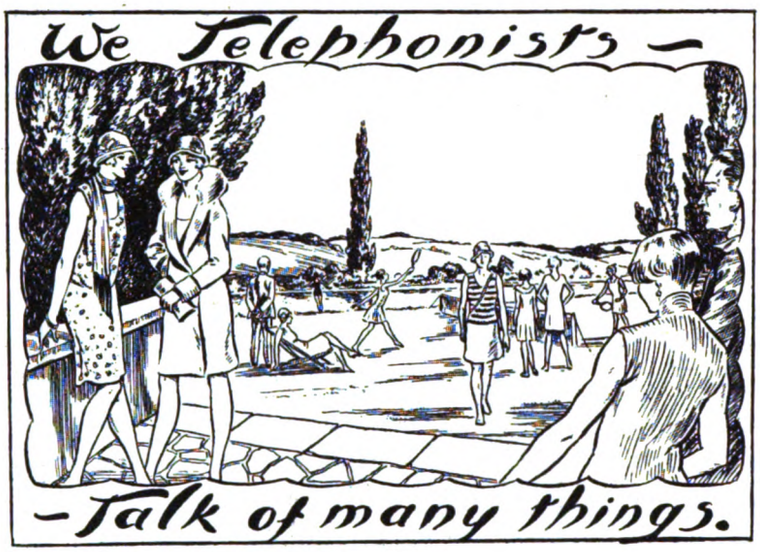

Windows.

SHE is really most remarkable. I should never have thought of writing on such a subject, but she—eh ? why, the Editress, of course. I thought I'd told you. As I was about to remark, I was poking round her waste-paper basket hoping to discover some sort of inspiration. Sometimes I find in it a choice morsel or two which gives just that necessary touch of the onion to the tripe I inflict upon you. Whilst poking I heard a step, and on looking up I was confronted with an editressial frown. I realised at that moment how thankful I was that nature had not fitted me with celluloid eyebrows, because my blush would have consumed them in a flash. "Well ? " said she, her brow darkening. "Yes, thanks," I said, "er—I mean that er—I was looking for my increment form, er—it seems a bit overdue." "Go away," she said, "and write about windows." Just that, no more—windows !

Windows ! Just fancy, I don't know anything about windows. There are, of course, those at home—those that I clean and those that I don't, and the latter outnumber the former by infinity. Camou says—but perhaps I'd better not go into that, it's too painful (I disclaim any intention of a pun—it just happened). Since then I have thought so much about windows that I have been glad to press my fevered brow against the cool plate glass windows of Robes et Modes.

Windows vary in shape, size and character, but in purpose they seem to be divided between those through which we look outwards and those through which we look inwards. Some appear to be neutral because they are dark, but the darker the window the more perfect the reflection. Look into them and they reveal the burning glory of a westering sun or the wonders of an eclipse. They give back as much beauty as they receive. If we have been prone to flatter our face they, on their part, have repeated nothing but truth. Their candour is a challenge to us to preserve beauty and to create it.

The window through which we look outward gives a vista of the world and through it we escape from ourselves. We see the birds hopping to and fro unmolested, the trees, the flowers. We watch the slashing rain, the stinging hail, the swirling snow. Or we see forests of chimneys wreathed in black smoke, range upon range of monotonous roofs with broken tiles and encrusted bricks. And we watch men and women going up and down the world living as we have never lived or cannot hope to live—some made and some broken, some who are friends and some who are friendless. Reach out through that window and a hand-clasp with either is the hand-clasp of friendship.

To look through the inward window is to perceive unusual aspects of the commonplace. The room seems more comfortable than we thought ; even the flicker of the firelight conveys a warmth of welcome, and the chairs invite us to their cosy depths. Through that window the golden sunlight streams to glorify the bride at the altar, or to bathe the face of a sleeping child in heavenly purity, or to bring peace and hope to the sufferer. Through it we gaze into the castle and into the garret, seeing people as they are, getting nearer to them and realising that, after all, they are men and women. Through the windows of the streets we inspect the merchandise of the world, and we are amused or bored, envious or filled with an unsatisfied yearning that makes the soul sick.

I stared owlishly through windows set in horn rims and wondered vacantly whether, indeed, the window-cleaner were not a messenger from the gods sent to keep the windows of the world clear that men might see and know all things and each other.

PERCY FLAGE.

[Not content with giving his wife our name—for are we not the original Camou Flage ?—Percy alleges that *we*, as a change from our W.P.B., inspired him to write the above article ! The allegation is as transparent as his "Windows."—ED.]

Something to Look Back Upon.

The London Telephonists' Society has given its members many pleasant evenings, but none more so than that of April 26 last, when, at the Institute of Electrical Engineers, Dr. Thomas Watson, of U.S.A., spoke to us about "The Birth and Babyhood of the Telephone." We had, too, the delight of seeing Mrs. Watson, who accompanied her husband, and whose bright face was a joy and an inspiration to the audience as well as to the Doctor. The large audience would have been still larger had not a number of people gone by mistake to the building in which our meetings are generally held, and found then that it was too late to rectify the error. They have our sincere and unqualified sympathy.

Mr. Dive, our President, was in the chair, and he introduced Dr. Watson to the meeting in his happiest way, and with that aptness of phrase which we always expect from him, and which adds in no small measure to the total sum of the success of an evening.

The Doctor's charm of manner was instantly felt, and for an hour we listened with the keenest appreciation to what was in every sense of the word the romantic story of the telephone. We wished that we had had the added privilege of hearing the Doctor's voice uplifted in song—one of those with which, when the telephone was invented, he used to hold American audiences spell-bound—"Hold the Fort," "Yankee-doodle," "Pull for the Shore," "Auld Lang Syne" ; appropriately, "Throw out the Life Line," and, inappropriately, "Do not trust him." We *did* trust him—on sight, and our hope is that before he leaves England, he will again "entrance our senses and delight our eyes," or, if that pleasure is denied us, that we shall one day meet the Doctor in his beloved America. Meanwhile, the sonnet that follows expresses, in a small way, the feelings with which he inspired us :—

Shall we compare you to a summer's day,
Now we have seen you, and have heard you speak ?
Ah, no ! Such praise is far too faint, too weak.
That genial warmth, that smile so blithe and gay ;
The charm of voice, the joyous, friendly way
In which you greeted us—no moments bleak.
As summer shows, you gave, but e'er did seek
To spread bright sunshine, and its beams display.
Dear Dr. Watson—we do not forget.
You gave us of your best from memory's store,
The dreams of youth, of high adventure set
Before your boyish eyes—young manhood's lore.
These things remain—and you are with us yet,
Enshrined within our hearts for evermore.

Opening of the Queen Mary's Wing of the Elizabeth Garrett Anderson Hospital.

The party of seven who represented the London Telephone Service when Her Majesty the Queen performed the opening ceremony on May 8 had a very happy experience ; their only regret being that all their colleagues who had helped so generously towards the "Purse" which was presented to the Queen on their behalf could not be present also. When the presentation was being made the Treasurer informed Her Majesty that it represented a gift of over £2,000. (The actual amount was £2,220, of which £2,000 was given to the Endowment and £220 to the Building Fund).

After the Queen had declared the New Wing open, she made an inspection of the Hospital, visiting every patient, and, like a true mother, asking specially to see a baby boy who had arrived during the early part of her visit.

We, too, made a tour of the Hospital subsequently, and we only wish that every one of you could see it. Advantage has been taken of the building of the "New Wing" to fit up the whole hospital with the most modern equipment possible. Amongst other things, we saw beautiful lamps in the operating theatre which can be so adjusted that the hands of the surgeon throw no shadows on her work. The out-patients' department, too, has been brought up to date, a canteen has been provided, and the consulting rooms are so arranged that patients are summoned from the waiting room by visual signals, and complete privacy is secured for each patient during the consultation.

There is, however, one thing about the Hospital which has remained unchanged from the date of its foundation 62 years ago, and which you feel directly you enter its doors—that is the spirit of loving service in which it was conceived and in which it has always been carried on "by women—for women." It is no institution, but a real hospital for the healing of the sick.

The Secretary has promised to arrange shortly for further parties to be shown round the Hospital. We are anxious that as many as possible should go, and we feel certain that they will come away, as we did, feeling that it will be a privilege to be allowed to have a further share in this work of healing.

A. C.

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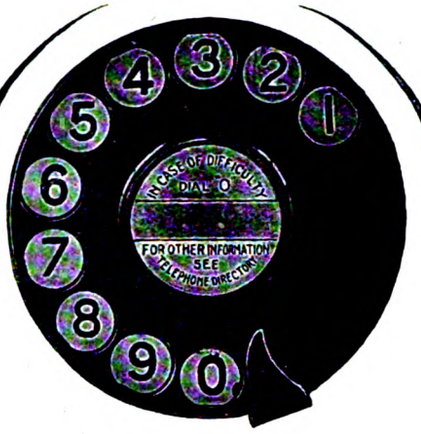

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[The London Supervisors and Telephonists excel, as we know, in every field of sport, on the concert platform, in amateur theatricals—whatever they find to do, they do it with all their might. But their greatest achievement must surely be that of giving. Practically the whole of the "Purse" presented to the Queen was raised by them; as was the sum of £2,422—another record—given last year to the Hospital Saturday Fund. The men at St. Dunstan's, the National Sanatorium, Benenden, and many kindred institutions also have reason to be grateful to the "Hello" girls, not only for regular subscriptions, but for their services so willingly, sympathetically, and regularly given.

Not in the unfair and uninformed criticism so prevalent in the Press to-day do we get a true presentment of the "Telephone girl"; but rather in these continual acts of generous loving-kindness; and it is good for us to turn sometimes to her real picture. We are very proud of and grateful to our colleagues.—ED.]

Contributions to this column should be addressed: THE EDITRESS, "Talk of Many Things," *Telegraph and Telephone Journal*, Secretary's Office, G.P.O. (North), London, E.C.1.

RETIREMENT OF MISS M. F. BUTLER.

MISS M. F. BUTLER, Chief Supervisor, Victoria Exchange, retired from official life on March 31st. She started life in the late National Telephone Company, in the year 1883, and was appointed Clerk in Charge of the Westminster Exchange in 1898. At the time of the transfer of the Ex-National Telephone Company to the Post Office, Miss Butler was chief Supervisor at the Kensington Exchange and since then she has been in charge at Holborn, London Wall and Victoria.

Miss Butler's vast experience of Exchanges made her well known in the service and she was esteemed and loved by all who knew her. She was strict but kindly, and very sympathetic to any who were in distress.

A reception was held at the Victoria Exchange on the evening of March 27th, when Miss Butler was presented with a number of beautiful gifts and two cheques. Miss Cox the Superintendent, F.E.S., presented the cheque from friends and colleagues in the Service, and Mr. Oldham, the Section Superintendent presented a cheque from the Staff at Victoria Exchange.

The reception was followed by a Supervisors Dinner, which was held on the evening of April 9th, at Stewarts Restaurant in Regent Street, a very enjoyable evening was spent. The Company assembled numbered 140, and included two senior chiefs who retired from the Service some years ago, Miss Ralph and Miss Newman. Miss Cox, the Superintendent, F.E.S., acted as chairman for the evening.

Miss Butler, who received the guests, was presented with a number of beautiful bouquets, sent by the staff from various Exchanges, and when she finally sat down to dinner she could scarcely be seen for flowers. After dinner a musical programme was provided by the guests. The Misses Amy and Garney presided at the piano, and the Misses Brereton, Foster, Gilbert Kemp and Longman gave musical items. Altogether a very happy evening was spent, and after Auld-Lang-Syne, we said good-bye to Miss Butler.

And so another senior woman has passed from official life.

A. E. R.

NATIONAL SANATORIUM—BENENDEN.

THE last Concert of the Season, organised by the Staff of the London Telephone Service under the direction of Miss Margaret Worth was held on Saturday, the 13th April.

The Artistes were:—Miss Nellie Beare, Soprano, Miss Margaret North, Mezzo Soprano, Miss Mollie Aldridge, Entertainer, Mr. Bob Douglas, Scotch Character Humorist, Mr. Arthur Hemsley, Baritone, Mr. Hugh Williams, Tenor, and Mr. John Harris, Entertainer and Accompanist.

The Concert was declared by all to have been the best ever given at the Sanatorium. Opening with "Sea Chanties," conducted with Mr. Williams, following on with duets by Miss Beare and Miss Worth, the programme went with a swing. Bob Douglas was in great form and although encores were prohibited in the first half, the patients clamoured for more. Mr. Harris and Miss Aldridge completed a feast of humour. The Quartettes "The Torpedo and the Whale (Audran), and Strange Adventure (Gilbert and Sullivan's Yeoman of the Guard)" proved that concerted numbers were exceedingly popular.

A report of the Concert would not be complete without reference to the charming singing of Miss Nellie Beare, and the warm reception given to Mr. Arthur Hemsley for his splendid rendering of several ballads. A most enjoyable evening both to artistes and audience was brought to a close by singing "Auld lang syne."

Before leaving the Hall, the Medical Officer in charge, proposed a cordial vote of thanks to the party and to the staff of the L.T.S. He referred to the immeasurable good such visits did to the patients. The entertainment, he stated, was a real bright and sparkling tonic. Particular mention was made of Miss Worth's work in securing the artistes, arranging the programmes and furthermore, of the part she fills in assisting with musical items from time to time.

In responding for the L.T.S. and artistes, Miss Worth assured the Staff and patients that it was a pleasure to herself and colleagues to pay these periodical visits to the "San" and particularly mentioned those professional friends outside the Service who so willingly offered to help. With their customary hospitality the Matron and Staff provided tea and supper for the party and after the latter meal, Mr. Williams claimed the privilege once more of expressing the appreciation of the artistes for all that had been done for their comfort. An outstanding feature of these Concerts is the welcome the Artistes receive from the patients when they distribute cigarettes, chocolates, sweets, etc., provided by the Staff of the L.T.S. after the programme has finished.

Doubtless some of them, particularly provincial patients, rarely see a visitor, and they have come to regard the Concert Party as personal friends, with the result that the after meeting developes into a sort of re-union. The patients, staff, and indeed the artistes are all looking forward to next Season's series of Concerts and feel sure that the Staff of the L.T.S. will once more make a very generous response when the appeal is launched for funds to provide these entertainments.

OBITUARY.

MR. J. J. O'CONNOR, READING.

READING has lost one of its better-known citizens by the death on Tuesday, the 7th inst., of Mr. J. Joseph O'Connor, late Contract Manager for the Post Office Telephone Service, Reading District, and recently Secretary of the Reading Chamber of Commerce.

Mr. O'Connor entered the service of the National Telephone Company at Brighton as a Contract Officer when that Company was in competition with the Brighton Municipal Telephone Service, and was later promoted to the rank of Senior Contract Officer.

On the opening of a Contract Department in the Reading Telephone District in 1906 Mr. O'Connor was promoted to the rank of Contract Manager and transferred to Reading. He continued in the same rank on the transfer of telephones to the Post Office in 1912 and retired in 1923.

His position in the Telephone Service was concerned with the development of that undertaking in Berks, Bucks, Oxon and parts of a number of neighbouring counties. He carried out this duty with considerable energy, and during his tenure in the Reading district saw the number of telephone stations grow from 3,604 to 16,785, to serve which there was also a considerable increase in telephone exchanges and call offices.

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THE

Telegraph and Telephone Journal.

VOL. XV. JULY, 1929. No. 172.

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All correspondence relating to advertisements should be addressed to MESSRS. SELLS, LTD., 168, *Fleet Street, London, E.C.4.*

TELEGRAPH AND TELEPHONE MEN AND WOMEN.

LXVI.

SIR BASIL BLACKETT, K.C.B., K.C.S.I.

SIR BASIL BLACKETT is likely to become better known to Post Office men in his business capacity as Chairman of the Communications Company than he was during the course of his short but brilliant career as a Civil Servant. It is therefore quite appropriate that we should include him among the Telegraph and Telephone men whom the *Journal* introduces to its readers.

Sir Basil was educated at Marlborough and Oxford and entered the Treasury through the Class I examination (in which, we believe, he took first place) in 1904. During the War he was entrusted with more than one financial mission to the United States, and from 1917 to 1919 represented the British Treasury at Washington, returning to Whitehall

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for three years as Controller of Finance. They were followed by six years in India as Finance Member of the Government, where a singularly successful administration was marked by the reorganisation of Indian finances and the restoration of stability under very difficult political and economic conditions. On his return from India in 1928 he left the Service, becoming a director of the Bank of England.

A strong man in every sense, he combines with great intellectual powers a breadth of vision and an openness of mind which qualify him in a special degree for dealing with complex questions in a period of rapid change and development. Telegraphic communications are, we believe, a field of activity which is new to him: but his past achievements in other fields are a guarantee of his success. His modesty and accessibility endear him to his associates, and all Civil Servants will wish him well in his new position.

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HOW TO IMPROVE THE TELEGRAPH SERVICE.

VI.—BY A PROVINCIAL CHIEF SUPERINTENDENT OF TELEGRAPHS.

[NOTE.—*The Editing Committee accepts no responsibility for the views expressed in this series of articles.*]

CAN the Telegraph Service be improved? The answer is in the affirmative, but it should be understood that this remark is not intended to support those sensational newspaper articles which describe in terms more imaginative than veracious the chaotic and other awful conditions into which the Telegraph Service is alleged to have drifted.

All thoughtful people must realise that the service to-day affords opportunities for almost boundless improvement, notwithstanding the fact that the present organisation and standard of staffing are capable of providing a reasonably satisfactory service, not one whit inferior to that which obtained, say, before the War. Yet although it is unnecessary to remind anyone connected with the Telegraphs that the prime object of his calling is to provide an efficient and economical service, it is not easy to indicate a standard by which the desired efficiency can be measured. Telegrams are urgent communications; but their urgency varies. Roughly, all telegrams can be divided into two classes—very urgent and less urgent. We could provide an exceedingly rapid and consequently expensive service which, while suitable for the very urgent telegrams, would give to the more numerous but less urgent messages quicker treatment than is necessary; or by exercising greater economy we could base our standard on the requirements of the less important messages, to the detriment of those of a really urgent nature. But neither of these plans would meet the whole requirements. The ideal arrangement would be that under which each type of telegram received the treatment, neither better nor worse than its urgency demanded. Obviously the responsibility of discriminating could not be undertaken by the Department, and the solution seems to be to introduce a higher charge for the more urgent traffic. Normal transit times of, say, 30 minutes and 90 minutes, respectively, for the two classes of traffic could be adopted. Much could be said in favour of a change in this direction, but the chief advantage would be that more effective arrangements could be made for the expeditious handling of the very urgent traffic, whilst the remaining work could be disposed of with greater regard for economy by reason of increased allowable delay.

The history of the Telegraph Service since 1870 has been one long story of endeavour, the object always being the improvement of the service. During the past twenty years the struggle has steadily become more intense until now the culminating point seems almost to have been reached. The progress in the direction of improved apparatus and methods of working during recent years has been almost startling in its rapidity, and a complete transfer from Morse to modern systems of working has been effected on the whole of the main lines, and on a great number of the less important routes. Theoretically, the newer systems of telegraphy, with their much more complicated and costly apparatus and their increased running costs, should have produced results far in advance of the simpler and older methods, but, in practice, although we can discern a certain increase in output, complete efficiency remains to be attained. In view of the extent and rapidity of the changes, this may not be altogether surprising, but the time seems to have arrived when we should "take stock," for it is apparent that during the last few years we have, as it were, been fighting a running battle, continually advancing without yet having had the opportunity of consolidating our gains.

It goes without saying that the quality of the service depends largely upon the efficacy of the apparatus and the capacity of the operators to get the best out of it. One of the chief present-day deterrents against satisfactory operator output is the instability of modern apparatus. Nowadays interruptions are much more serious than they were hitherto, on account of the greater carrying capacity of individual circuits; and only responsible supervising officers who have experienced the effect of stoppages on busy modern circuits during pressure periods can fully realise the desirability of improvement in this respect. The attendant congestion and dislocation are not restricted to the actual time of interruption, but begin with the onset of the trouble and end only when the "clearing up" process is complete. True, much has been done to improve the stability of modern circuits by Headquarters in conjunction with the Engineering Department, but more remains to be done, and we cannot afford to relax our efforts until Multiplex and Teleprinter apparatus is freed from this disadvantage and stoppages are the rare exception rather than the daily occurrence. So far as the Engineering Department is concerned, the objective seems to be to ensure that there be no weakness in the design and construction of the apparatus or in its installation and maintenance; and always to be alive to the possibility of simplification and improvement. The Engineers are fully aware of their responsibilities and we confidently leave this side of the matter in their hands.

Divided Baudot circuits, of which there is a goodly proportion, increase the difficulties arising from instability, inasmuch as an interruption on either side of the intermediate office affects two main channels. The absence of direct touch between the dirigeurs at the terminal offices, who are dependent upon the intermediate dirigeur for prompt attention and co-operation, seriously detracts from the efficiency of these circuits. The interposing of the third party cannot but produce results much less satisfactory than those obtainable on straight circuits. Three station circuits are, of course, "materially" economical, but by their greater liability to interruption they forfeit this advantage. Wherever practicable, then, the replacement of divided circuits by direct Teleprinters is advocated as a necessary step in the direction of improved stability.

We cannot leave this part of the subject without referring to the great need of dirigeur efficiency, which is so essential to Multiplex stability. By prompt and accurate diagnosis, a really efficient dirigeur is able to reduce interruptions to a minimum; and full co-operation between dirigeur and supervisor is an invaluable factor in the expeditious disposal of traffic. It is of the highest importance, therefore, that the dirigeur should be an officer possessing special qualifications. In the past there may have been a tendency to lean in the direction of seniority in selecting dirigeurs, and no discredit is implied by the admission that this has not always had the best results. But if we are to reach the highest degree of efficiency in autoplex and multiplex working, the first consideration in the selection of a dirigeur must be his personal and technical qualification for the job, and the officer possessing these qualifications in the greatest degree should be chosen whether he be senior or not. His training in dirigeur duties should be thorough, and it would undoubtedly be beneficial if a system of central training were set up, say in London and several other large centres, and tuition were given on definite and standard lines, abreast with modern developments. The instructors chosen would need to be specially qualified and suitable men working in close touch not only with each other, but also with the Engineering Department and the Traffic Section.

The employment of dirigeurs as dirigeur-operators, under any circumstances, is, in my view, open to objection. When a dirigeur is so employed he cannot concentrate, either as dirigeur or operator, and one part of his duty must suffer. Moreover, it frequently happens that a dirigeur-operator (supposed to carry only three quarters of a full load) is working to an operator from whom full output is expected. The disadvantage of this arrangement is obvious. For these reasons I suggest the abandonment of this system, and, instead, I would give the dirigeur the oversight of more than one circuit during the less busy hours.

To secure the uninterrupted running of Teleprinter circuits, at which dirigeurs are not employed, the general testing arrangements of an office should provide for each such circuit to be rigorously tested under working conditions every morning before actual

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working commences. The tests should be conducted by officers of the Commercial and Engineering Staffs at both ends of the circuit—working in conjunction. Rigid adherence to such a practice would reduce to a minimum stoppages of a serious nature, i.e. those which could not be dealt with by the operators themselves, assuming, of course, that the operators were properly trained in and thoroughly conversant with the making of simple adjustments.

Primarily, then, my plea is for more efficient and stable working conditions, but can it be said that this meets the whole trouble? I am afraid not. Certainly, as has already been indicated, the development from Morse to machine telegraphy has been extremely rapid, and, bearing in mind that a wholesale change of apparatus has entailed a concurrent adoption of entirely new methods, we need not be discouraged if we have not yet attained the standard of operating efficiency we all aim at. Also, the factors of age and long familiarity with less rapid methods are important, and must not be under estimated, but we must try to realise that modern apparatus involves a new conception of values.

Although telegraph operating has become less personal and more mechanical in character, it still calls for a high degree of skill and specialised knowledge, and we must not, indeed we cannot, expect satisfactory results from the new and costly keyboard apparatus until our operators, fully competent in all other directions, have become highly skilled touch typists. Unfortunately, we have a considerable amount of leeway to make up in this respect, but once the staff realises the need and is given the opportunity of remedying the weakness, there will be a ready response on their part. Without going into detail, it seems evident that, until comparatively recently, there has not been sufficient insistence upon this most important factor. To this I would add that widespread misconception of the true purpose of the staffing standards has hindered progress towards full efficiency. By this I mean that when the Telegraphing Staffing Standards were first discussed, there were many who immediately concluded, and who still think, that the figures given were standards of output or rates of working. This, of course, is not the case. The figures are intended to furnish telegraph officials with a standard upon which to provide staff. The setting-up of standards applicable to all offices must be credited to the Department as a very wise and businesslike move, whether we agree with the actual figures or not. So far as individual output is concerned, the figures have no value. At times of pressure, the Staffing Standards will be exceeded, and at quiet times they will not be reached.

Again, the very early stage at which training in touch typing is discontinued (ability to type 25 telegrams in half an hour), gives a false impression as to the value of keyboard operation. We discontinue training when a speed equivalent to approximately 17 words per minute is reached, and with these meagre qualifications an officer has to attempt to deal with live traffic at a circuit with a speed up to 40 words a minute. This is clearly unsatisfactory, as it is more than likely that the newly trained officer will be employed at a circuit staffed on a basis considerably in excess of his maximum capacity. It is true, of course, that his speed soon improves, but my experience leads me to suggest that as soon as he reaches the point at which he is able to transmit the standard load, further progress is slow, and, in the end, there results a mediocre state of efficiency, beyond which there is in most cases no inclination to proceed. I would urge, therefore, that the period of training be extended until the trainee reaches a speed of, say, 35 telegrams in half an hour. Afterwards the further practice would be with live traffic, but periodical tests in the school would be continued until a speed of 50 telegrams in half an hour was reached, when a certificate of full efficiency could be given. It is conceivable, of course, that a proportion of the present staff would not be able to qualify for such a certificate, but in these cases there would probably be other work for them to do. The more complete training provided under this proposal would be beneficial to the operator inasmuch as he would realise that he was able to turn out the best work, both in quality and quantity, without taxing his energies, and the improvement in the Service could not fail to be considerable. The point to be stressed here is that, although there is a plea for increased output, it is not suggested that this should be achieved by greater exertion on the part of the operator, but rather by considerably increasing his skill in touch typing and enabling him to perform his work with much greater ease.

Any efforts towards increased efficiency on the lines indicated would be nullified if they were not applied generally. Thus it would be necessary for the process to extend throughout the whole Service from the Central Telegraph Office downwards.

It would indeed appear that no radical improvement could be hoped for if the Central Telegraph Office, by far the largest and most important unit, did not assume its rightful place in the van of the movement. The enormous difficulties inherent in that huge organisation may seem to render the task well-nigh hopeless, but with goodwill and determination on all sides, success can be achieved. With the Central Telegraph Office leading the way, we shall not find the Provinces lacking, and I predict as the result a happier and more efficient service than has yet been attained.

MOVING TRAINS AND TELEGRAPHY, TELEPHONY, AND TELEVISION.

THE general public have become accustomed to the fact that aeroplanes are able to communicate with one another and with land stations either by Morse telegraphy or the telephone. Thus no one of the non-technical press has apparently taken note of the experimental and successful conversation held between an aeroplane flying at 95 m.p.h. 2,500 ft. above a township in New Jersey and the laboratory of the Bell Telephone Company outside New York.

Strange to say, however, that in some quarters surprise is now expressed at the possibilities of similar and even more extended communication between moving trains and stationary buildings such as telephone exchanges and telegraph offices, &c.

Two or three years nowadays is a considerable period in the history of scientific development, and it is therefore instructive to recall that in August, 1925, the German wireless periodical *Die Antenne* published an interesting and somewhat detailed article on experiments which had by that time shown every sign of success, and if my memory serves me correctly even gave photographs of the railway carriages fitted with receiving roof aerials. Certainly in December of the same year the *Deutsche Reichspostamtsblatt* (the equivalent of our P.O. Circular) contained the first instructions regarding the acceptance of telegrams "on certain moving trains not only for Germany but for all foreign countries." In October of the following year the L.N.E.R., using the "carrier current," made certain experiments between one of their expresses on the section Potters Bar and Peterborough, the coupling aerial being stretched along the length of two carriages. From the details, which it is not necessary to particularise for the purposes of this article, it was evident that the system had direct relationship to that used by the German Government, or rather by the private company licensed by the Reichspostamt.

These conditions, by the way, were specially precise, not to say exacting, nevertheless the company took up the service, and by improving its technical side and developing the commercial aspects, has held on until now.

The first service was that given to 10 trains per day, i.e., five each way between Berlin and Hamburg, roughly 200 miles, and provided three telephonic traffic circuits and unrestricted telegraph traffic. This demanded no less than eight wavelengths. The fixed stations which dealt with the transmission and switching were :—

(1) Spandau (Berlin.) (2) Wittenberg. (3) Bergedorf (Hamburg.)

Thus speech was possible with any one of these three stations, a few local extensions at the two termini, which were also able to give certain extensions, while trunk calls were made through the Trunk Exchange at Wittenberg. Thus simultaneously speech

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could be had from the same train by three callers, one each to Wittenberg and the two termini respectively. In addition one circuit was always available for telegraph traffic, the Government having preferential use of the same.

The system was to be extended to Munich and other centres later, and this appears to have been done judging from the continued success of the system.

Le Bulletin Mensuel some little time ago mentioned certain telephonic communication tests on the Paris-Bordeaux express. On this occasion facilities were afforded for 60 listeners. The result then reported was, that the experiment had been a real success except when the train was travelling over electrified sections of the route. Whether these last-mentioned difficulties were purely local did not emerge, and whether they have since been surmounted there is no published record so far as the writer's data serves him.

At any rate, what appears to be the satisfactory sequel to this interesting railway run is the recent announcement from Paris that a company has been formed entitled the *Radio-Fen Société pour la radiophonie dans les gares et sur les reseaux de chemins de Fer*, with a capital of 100,000 francs, to install radio receivers at the railway stations and on passenger trains in France. The objects are in principle the same, though not identical with the system as at present exploited in Germany. The company just mentioned is known to be working in conjunction with a Hungarian company, which latter organisation, it is understood, has not a little to do with the installations in use on German trains.

Following close upon these facts, and probably for some time being worked out on parallel lines, come the Canadian National Railway experiments, which have also proved successful. To quote *The Times Engineering Supplement* of May 25: "On a demonstration trip a telephone conversation was carried on between passengers on a train travelling at 50 miles per hour and a Canadian National Railway official at his desk in Toronto." A further trial was made when Mr. W. D. Robb, vice-president of the T. and T. department of the C.N.R., spoke over the telephone from a fast-moving train his speech being transmitted from aerials on the roof of the carriage, the railway telegraph lines conveying the speech, which was also received by a broadcasting station, repeated on another wavelength, and picked up by the receiving apparatus of the moving train from which Mr. Robb was speaking, and of course was likewise heard by many of the ordinary listeners-in.

Reuter's Ottawa agency adds that "the new process eliminated many of the difficulties now experienced with similar voice-transmission by the system operating in Germany."

It may be mentioned that Mr. W. G. Barber, General Manager of the C.N.R., was also associated with the trials which it is now proposed to follow up by "the actual installation of wireless telephone equipment on a number of C.N.R. trains to enable passengers to keep in constant touch with their homes or business offices."

It is fully worthy of note that one pair of the telephone wires which ran by the side of the Canadian railway track was itself carrying ten telegraph messages simultaneously, and yet there was no sign of *interference*, so perfectly had the voice-frequency system been adjusted.

To telephone to home or office while rushing at 50 m.p.h. across Canada, yet sitting in the most comfortable of arm-chairs—which, *inter alia*, can be changed into a fully-equipped wash-basins at will—what could be more typical of modern scientific developments and human ingenuity?

Do we wish to add a dancing-room to the Pullman trains, as has been inaugurated in the U.S.A.? Heaven forfend!

However, television will follow without doubt, for were not pictures of the Derby successfully transmitted on the day of the race by means of the Fultograph process to the "up" Scotsman as it rushed between York and Grantham and the "down" raced through Northumberland?

J. J. T.

INTENSIVE CANVASSING.

A BACKWARD canvassing area may be defined as an area in which the rate at which orders are being obtained is not commensurate with the development forecast figures on which exchange and line plant have been provided. Intensive canvassing may be defined as the introduction into a backward canvassing area of a number of additional Contract Officers in such a way that the area is divided up into so many parts, one part being given to the Contract Officer normally responsible for the whole area and the remaining parts being given to the assisting squad. During the period of the intensive canvass each Contract Officer to whom a portion of the backward area has been allotted is responsible, and alone responsible, for all the canvassing in his portion. He deals with written applications and all the unsuccessful interview cards affecting that portion.

It is this well-defined division of a backward area into separate parts which marks the difference between intensive canvassing and squad canvassing. Squad canvassing also meant the temporary introduction of a squad of Contract Officers into an area where it was desired to stimulate development, but it had the feature that, as the Contract Officer responsible for the area was left on his ground, there resulted overlapping and duplication of effort between him and the squad. Intensive canvassing overcomes this objection in a simple and effective way.

During the period of attack, intensive canvassing, except in very exceptional cases, will not increase or even maintain the average number of orders obtained per man in the area dealt with. If, for instance, a Contract Officer whose district came under intensive canvassing had been obtaining orders at the rate of 10 exchange lines per week, and an intensive canvassing squad of 2 men were appointed to his district, I would not expect 30 exchange lines per week to be obtained from the combined forces of 3 men. There are three reasons why the number would fall short of that figure:—

(1) In London applications, written and verbal, are the source from which the majority of orders are obtained. These applications will not increase because of the appointment of additional men on a Contract Officer's ground. If the ten orders per week obtained by the Contract Officer were made up of three from pure canvassing and seven from applications, and a squad of two men were appointed to his area, the pure canvassing figure of three orders should, roughly, be trebled, making a figure of nine orders in all, but the applications figure of seven would remain constant. The total figure would, therefore, not be 30, but 9 + 7, or 16. To this figure, however, something would require to be added owing to the fact that the applications would, during the period of intensive canvass, be divided amongst three men, and each man would have more time to devote to pure canvassing than the original Contract Officer who took all the applications. In London three-fifths of a Contract Officer's time are devoted to applications and two-fifths to pure canvassing, and the total figure to be added to the pure canvassing figure, due to the fact mentioned, works out at nine, making the total orders from pure canvassing 18, or six per man. This figure of 18, added to the applications figure of 7, which remains constant, gives us a total of 25 orders in all from the area.

(2) The second reason, although it applies to London, need not necessarily apply elsewhere. When we started this scheme of intensive canvassing in London it was found convenient to employ new and not experienced Contract Officers on the work. It was convenient for two reasons, first, because the withdrawal of experienced men from their areas would have prejudicially affected for the time being the number of orders obtained from such areas, and secondly, because we do not care to give newly trained men much paper work, and under intensive canvassing a man has less paper work than if working an area under normal conditions. Although, however, the appointment of newly trained men to the work meant that the scheme was inaugurated with the minimum

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amount of dislocation to existing conditions, it meant also that we did not get quite such good results as with experienced men. A Contract Officer in his first year obtains results equivalent to 80% of the results of an experienced man. The application of this factor to the case of the area quoted above means that each of the two men forming the assisting squad, instead of getting 6 orders by pure canvassing, would get four and four-fifths, or, say, 9½ between them, and this, added to the results obtained by the experienced man already in the area, which would remain at 6 as before, gives a total of 15½ for all three men from pure canvassing. In other words, the total orders from the area would be reduced from 25 to 22½.

(3) Thirdly, there is the point that a Contract Officer on a diversified area, an area where the class of property varies, as, after all, it does in every canvassing area, is in a position to choose districts to which to give his attention. Naturally, he devotes his time primarily to those portions of the area from which he expects good results. If his area is cut down by two-thirds, he is not in such a good position to choose. He is forced—and his temporary assistants are forced—to give attention to less productive parts, to canvass streets and roads and premises from which orders for telephones are not readily obtained. It is right, therefore, to reduce, because of the fact that less profitable districts have to be tapped, the figure of 22½ mentioned under (2). The figure of reduction would, of course, vary according to the area shown for intensive canvassing. In London a figure of 20% was applied as an average reducing figure consequent on this factor. The application of this percentage to the case taken as an illustration brings the figure of 22½ to 18, or 6 per man from all sources—applications and pure canvassing.

I mentioned at a recent meeting of District Managers that we were giving a trial to intensive canvassing in the four Contract Districts into which the London Telephone Area was divided. The trial has now been completed. The scheme was applied in all to 16 backward canvassing areas. It fitted in smoothly with our normal canvassing arrangements, and resulted in every case in additional subscribers being obtained in districts where we had superfluous plant, and to that extent may be said to have been successful. The actual figures of orders obtained were not, however, impressive. The results in one or two of the areas treated at the inception of the scheme, i.e., towards the end of 1928, were quite good. Subsequent results were disappointing, and in the majority of cases the figure of 6 per man was not attained. The later results cannot, of course, be put down to any inherent defect in the scheme, but must simply be attributed to the fact that, in the early part of 1929, partly because of trade conditions and partly because of the shadow of the General Election, orders were difficult to obtain. A General Election has invariably a detrimental effect on telephone business. The feeling of uncertainty creates an atmosphere calculated to check business, and there is a general tendency among business people to postpone decisions on such matters as can conveniently be put aside, telephones being one of them, until the country has decided on politics.

It is obvious that, in scrutinising the results of an intensive canvass, no comparison can properly be made with the figures of orders obtained during some period when the area was under normal canvassing. The circumstances obtaining during each such two periods vary so considerably that comparison between them would lead to fallacious results. District Managers who may consider that some such scheme would be beneficial in areas where the results are falling short of the forecasted figures will probably have to arrive at a figure per man, as was done in London, and decide on the basis of that figure whether, during the period of intensive canvass, the results have been satisfactory, or otherwise. A comparison could, however, and should, in my view, be set up for a period *following the intensive canvass* and the corresponding period of the previous year. The intensive canvass, besides bringing in an increased total of orders during its application in selected areas, should reasonably be expected to give an impetus to the rate at which orders will be obtained when the intensive squad is withdrawn. The increased publicity given in a neighbourhood during the four or five weeks of intensive canvass should help the flow of applications and should tend to make subsequent canvassing easier and more profitable, and, in addition, a heritage of unsuccessful interview cards, that is, cards containing the names and addresses of probable subscribers, will have been bequeathed by the intensive canvassing squad to the man left on the ground.

Intensive canvassing is not, of course, the remedy to apply to a permanently backward area. The fact that, over a long period, the results obtained have fallen short of the orders anticipated by the development forecasts indicates that the man on the ground needs permanent assistance. Intensive canvassing is intended to apply to temporarily backward areas, areas where the canvassing force is normally sufficient for the ground, but where the rate at which orders are being obtained has fallen for the moment so far behind the position with regard to Exchange and line plant provision that a special impetus is necessary to restore the balance.

C. W. MUIRHEAD.

KEW GARDENS AGAIN!

THE ninth summer reunion of former C.T.O. colleagues was celebrated at the usual rendezvous of the Imperial Restaurant, Kew. On this occasion, the 12th ult., there was a record attendance of 160 ladies and gentlemen, the function being unanimously voted a most successful meeting, the weather materially aiding in this result.

Expressions of regret were received from several persons who were prevented from attending due to absence from London, annual leave (*sic.*), and unfortunately in some cases failing health. Particularly was this the case with the much beloved Adam Gordon, whose condition was reported as very serious.

The deep interest taken in these gatherings was emphasised by the presence of members from Clacton, Worthing, Brighton, Westcliffe, &c., &c., and included Mr. C. Honeysett, late Postmaster of Henley, who with Mr. Joe Murray, came up specially from Torquay, Mr. J. Hopgood from Bournemouth, Mr. J. Thomas late Postmaster of March (Cambs.), who left the wilds of Chippenham for a few hours, even "The Archbishop," Mr. J. W. Twyman, tearing himself away from the lure of the cloistered Pantiles of Tun. Wells!

Reference to the passing over of Miss E. F. Greer is more appropriately made elsewhere.

REVIEWS.

THE Automatic Telephone Manufacturing Co., Ltd., Liverpool, have published "The A.T.M. Telegraph Engineers' Handbook" at the very moderate price of 2*s.* 6*d.*

The little volume should prove a useful companion to telegraph engineers and others interested in the technical side of telegraphy. The chapter on Telegraph Transmission on Overhead Circuits is an interesting one, due credit being accorded to Mr. Lawton, of the Indian Government Telegraphs, whose Official Technical Instructions the A.T.M. affirms "deserve to be better known."

The chapter on "Transients" requires considerable mathematical knowledge, but are not outside the normal engineer's ken. The Gulstad relay and the Vyle polarised sounder are very ably dealt with. The book is admittedly specially written for the guidance of existing users of A.T.M. telegraph apparatus, but all the matter, except the last 15 of its 115 pages, is of universal interest to telegraph engineers.

J. J. T.

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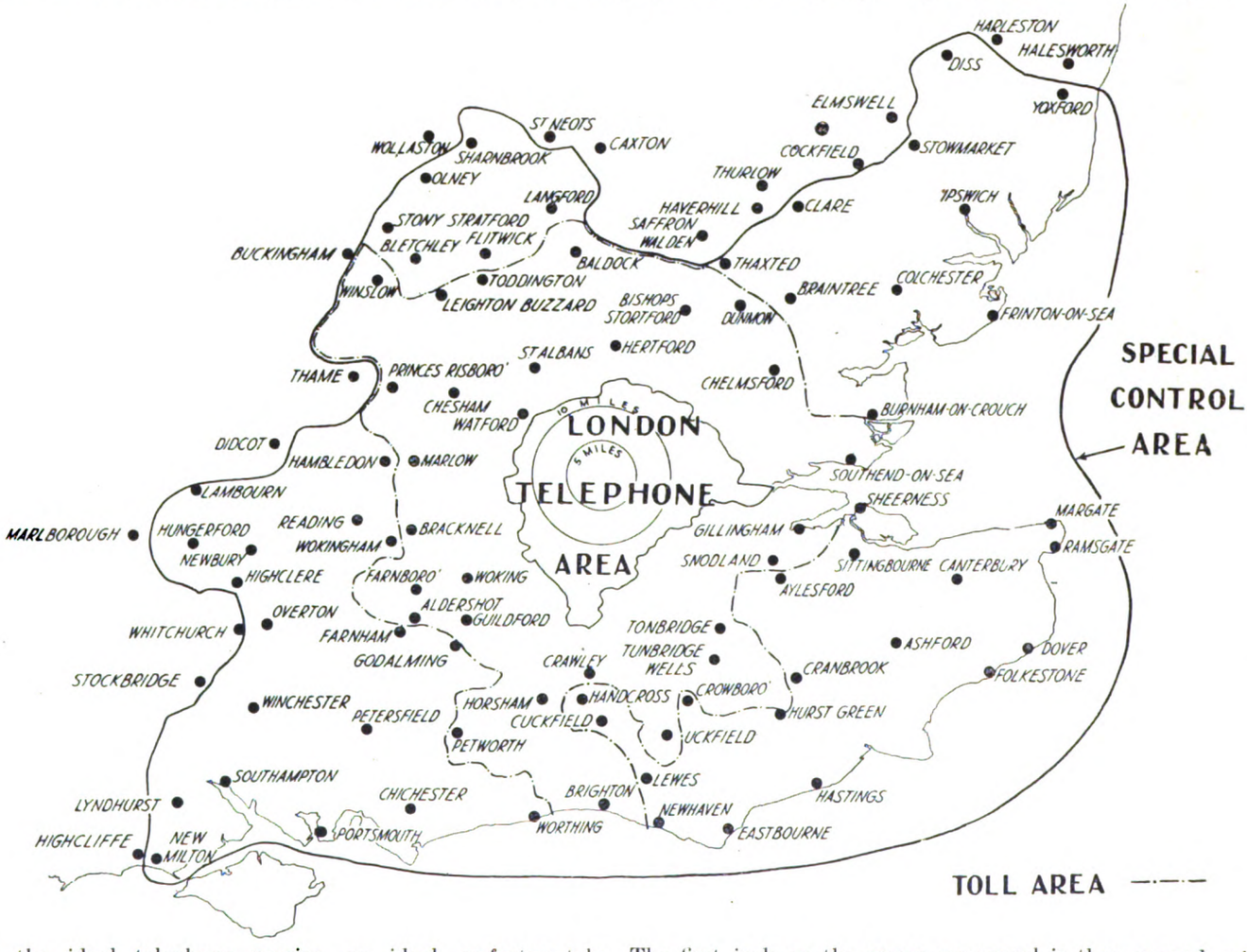
TELEPHONE SERVICE IN THE HOME COUNTIES.

THERE is probably no change in telephone service more striking to, and more appreciated by, the average subscriber than the conversion of a route he uses frequently from "delay" to "demand" working. For the process of booking a call and waiting for it to mature during an indeterminate period (which always seems much longer than it really is, and during which the caller feels tied to the vicinity of the telephone) there is substituted the smooth and easy method of demand, followed, in normal circumstances within a matter of seconds, by the reply of the desired party. Such a service without limit of distance must, in fact, represent the ideal telephone service—an ideal, unfortunately, unattainable over great distances without prohibitive cost, solely on account of the tendency of the demand to "bunch" into the busy business hours. Were it not for this tendency, that is, were the rate of demand absolutely even throughout the day, all services might, in fact, be on a "demand" basis. Since it would be clearly uneconomical to provide very long circuits to meet the maximum load, which is maintained over a short period only in each day, some measure of "lining up" demands, that is, artificially levelling-out the rate of demand, with consequent delays, becomes necessary during the busiest hours.

This condition has led to a sharp division of trunk routes into "delay" routes, worked from a trunk exchange or trunk positions in a local exchange, and "no delay" routes worked from local positions.

It will be clear, however, that, except in the peak hours, even the "delay" routes could carry the traffic on a "demand" basis, and some years ago a system of operating, called "Special Control Working," was evolved in an endeavour to secure the best of both worlds in this matter; that is, while avoiding the lavish expenditure which would be necessary to give a "demand" service at the period of maximum pressure, to secure for subscribers the benefit of a "no-delay" service during those hours when the demand was within the carrying capacity of the routes concerned. Under this system the circuits concerned are multipled over the local "A" and "B" positions, as well as over the position to be used as a trunk operating position for the route concerned in the busy hours. An operator receiving a demand involving any route liable to "Special Control" is able thus to complete the call on a "demand" basis whenever the traffic conditions on the route permit. If, however, at any time the rate of demand for any group exceeds the carrying capacity of the group, "Special Control" is brought into force.



The first jack on the group concerned is then pegged, with a peg indicating "Special Control," on every multiple except that serving the Special Control position. Under these conditions calls involving the route in question are ticketed at the "A" positions and the tickets passed to the Special Control position, where the route is worked under normal "delay" conditions. Calls originated at sub-exchanges involving routes liable to Special Control are controlled at the exchange of origin under normal conditions, passing through the "B" positions at the main exchange in the ordinary way. When a route is put under Special Control, however, the B operator at the main exchange is directed by the peg in her multiple repetition of the route concerned to divert the demand to a record position, where a ticket is prepared and passed to the Special Control position, whence the call is reversed and controlled. Except in cases of junctions engaged, number engaged or no reply, the sub-exchange thus either secures connexion on demand, or has the call taken over by the main exchange, and is relieved of further responsibility.

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A special advantage of the system is that "delay" working need only be instituted when the traffic conditions actually demand such a course, and it is thus independent of any pre-arranged time table. By these means connexion is given to the subscriber on demand during all times that the traffic conditions actually existing at the moment permit, and only under the usual "delay" conditions when the rate of demand exceeds the capacity of the group.

For a number of reasons the development of this system of working has not been rapid, but the way has recently opened for expansion on these lines, and the London Special Control System is the first result.

The problem of serving the outer suburban area of London and the country immediately beyond—commonly known as the Home Counties—has presented special problems with the rapid growth of London itself. The "dormitory" towns have always expected a no-delay service to the city area, and vice versa, and this condition was, no doubt, met sufficiently well when the limits of the original "London Telephone Area," which represented the no-delay area of its day, were determined many years ago (1896). With the continual growth of London itself, however, and the increasing tendency for city people to live further and further from the centre, this area became too restricted, and the London Toll area was created in 1921. This development represented a very great advance in telephone facilities, and brought within the London no-delay area many places 30, 40, and even 50 miles distant from the centre.

Such, however, has been the growth of the residential and business area of London that even this extension hardly meets present-day conditions. Yet to extend the Toll area still further would be an expensive proposition, since the additional circuits necessary would be in use for but a short period each day, the existing lines being adequate for the traffic outside the peak hours. These conflicting considerations offered an ideal opportunity for the application of the "Special Control" system of working, and the change over to this method within the wide area shown on the map above has, therefore, been made.

The effect of the change is to give a "demand" service outside the hours of peak traffic from every subscriber in the Special Control area, shown on the map, to every other in that area. No less than 45% of the total number of subscribers in the country are situated in this area, and are directly affected by the change, while incoming long distance calls from outside the area to places in the new Special Control area also secure more speedy connexion. Calls between places as far distant as Folkestone and Bedford, or as Lyndhurst in Hampshire and Diss in Norfolk, can now at almost all times be obtained on demand, but such through traffic is small by comparison with the traffic from the provincial exchanges concerned to the London central area, and it is in respect of this latter class of calls that the principal benefit will be felt.

The change over has been effected with a remarkable absence of difficulties, and may legitimately be regarded as a distinct step forward in telephone progress in this country.

W. C. G.

OBITUARY: THE LATE MISS E. F. GREER.

WE regret to record the passing away of yet another link with the Old Brigade of the C.T.O., by the death, after a long illness, at an advanced age, of Miss E. F. Greer, which took place at Worthing, at the end of May. Entering the old Electric & International Telegraph Company in 1863, the late Miss Greer transferred to the Post Office service in 1870, and came to the present C.T.O. in 1874, where for many years she took duty under her sister, the late Miss M. H. Greer, in the Scottish and other divisions, and later in the Matron's Office, of which her sister became the Chief. Of a somewhat delicate state of health, the deceased lady was unable to accept promotion to supervising rank and retired as a First-Class Telegraphist at the close of 1900. She was a most devoted companion to her sister, who predeceased her in 1925. To Miss A. E. Hale, her niece, and her other relatives, we tender our sincerest sympathy.

C. S. K.

TELEGRAPHIC MEMORABILIA.

THE very interesting "forecast" of Mr. Lowe in last month's issue, by a fortunate coincidence appeared at the same time as an article on "Picture Telegraphy" by another writer.

Mr. Lowe's suggestion of "a code of signs or symbols" each sign or symbol to represent, say a ten-letter code-word in one of the several universal code-books, is, of course, not an impossibility, although it savours somewhat of the Chinese system—turned the other way round!

Mr. Lowe understands that "the efficiency of word-transmission" by a facsimile process, is *greatly* impaired by the *least suspicion* of line or circuit interruption, but the words italicised express relative values which would probably differ with each individual who adjudicated.

Our Editor's foot-note to the very ingenious suggestion of Mr. Lowe, that a form of shorthand might assist in the more economical transmission of telegrams by means of telephotography, again depends upon the degree to which "the least suspicion of line or circuit interruption" actually proves detrimental to accurate reception.

Thanks to the courtesy of Dr. Lüschen of Siemenstadtwerke, I am able to present the following two figures, I and II, which respectively represent photographs, one of an original test-telegram

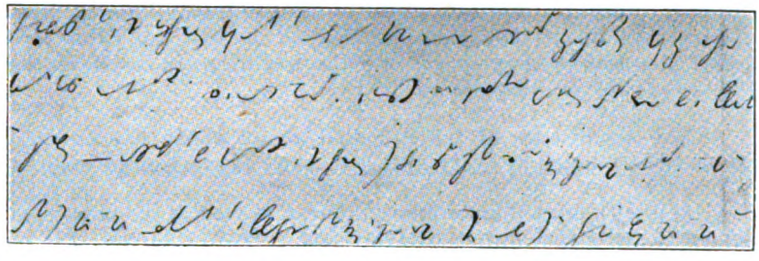

FIG. 1.

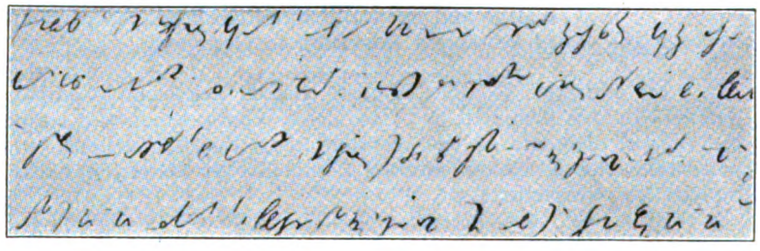

FIG. 2.

written in German shorthand taken prior to transmission over an underground telegraph circuit of about 250 miles, and the other that of the copy so received at the distant office by means of a telephotographic system.

It is reasonable to presume that if very slight interferences are likely to bring about serious distortion, shorthand would scarcely be the best medium for accelerating transmission and reducing the cost thereof. I am of opinion, however, that the systems are becoming more and more stabilised, although like all other telegraph systems they are naturally subject to "interference," at least occasionally. My space is filling up with this interesting subject and for the present I must leave it.

There is plenty of activity in the direction of Radio communication. In Europe, where a regular wireless service has been opened between Bulgaria and Great Britain, and where Spain is establishing, if she has not already established, a short-wave station at Aranjuez, in order, so it is said, to have direct communication with South America, free from London and Paris.

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A short-wave transmitter has been erected at Funchal on 47 metres for broadcasting purposes, and the Congress of Costa Rica has authorised the construction of three additional receiving stations, one in Liberia, another in the Canton of San Carlos, and the third in the province of Puntarenas.

Fernando Po also, although its geographical position is not very favourable, being so near the Equator, is to have a direct wireless service with Madrid. It is said that although the position as regards long-wave transmission is unfavourable, short-wave signals are well received from Europe.

Inter alia a medium-wave valve transmitter and receiver are to replace the present medium-wave spark station in the Colony for ship-to-shore and neighbouring colonies service.

A radio-telegraph service was also inaugurated between England and Siam at the beginning of last month.

In connexion with the Peruvian services the International Telephone and Telegraph Corporation, via All-America Cables Incorporated, has secured permission to establish wireless, telephone, and telegraph stations in Peru for point-to-point and international communication.

There is one very definite sign of the times in the fact that while the concession to the company is renewed for establishing submarine cables for international telephone transmission in addition to its present telegraph services, there is an additional binding clause which lays down the condition, *that all present and future lines must be capable of carrying both telephone and telegraph communication independently or simultaneously.*

The significance of the italicised clause above has no doubt already been noted by every responsible and alert telegraph engineer.

It is with more than ordinary interest, in view of the prominence given to the Baird system of Television in these columns, that one notes the following information supplied by the special Berlin correspondent of the *Daily Telegraph* :—

" . . . a large and powerful combination has been formed to work the Baird system of television in Germany.

" In addition to the English Baird Television Company partners in this firm will be : the Zeiss Works, which will supply the optical elements of the installations ; Bosch Stuttgart, who will make the necessary motors ; and Loewer Radio, specialists in wireless equipment."

J. J. T.

PROGRESS OF THE TELEPHONE SYSTEM.

THE total number of telephone stations working at April 30, 1929, was 1,762,624, representing an increase of 7,983 on the total at the end of the previous month.

The growth for the month is summarised below :—

	London.	*Provinces.*
Telephone Stations—		
Total at April 30	630,481	1,132,143
Net increase for month	3,767	4,216
Residence Rate Subscribers—		
Total	151,549	238,235
Net increase	1,456	1,577
Call Office Stations (including Kiosks)—		
Total	5,587	20,353
Net increase	—	88
Kiosks—		
Total	1,287	5,098
Net increase	14	93
Rural Party Line Stations—		
Total	—	10,442
Net increase	—	—
Rural Railway Stations connected with Exchange System—		
Total	17	1,111
Net increase	—	22

The total number of inland trunk calls originated during the year ended Mar. 31, 1929, was 109,554,447, representing an increase of 7,347,851, or 7.19% over the total for the previous year. Outgoing international calls for the year numbered 452,816, and incoming international calls 490,169, the increase over the total for the year 1927-28 being 113,196 (33%) and 127,817 (35%) respectively.

Further progress was made during the month of May with the development of the local exchange system. New exchanges opened included the following :—

PROVINCES—Durham, Aldridge, Bloxwich, Walsall (automatic), Broughton (Northants), Church Stoke, Clifton (Beds), Howick (Long Houghton), Quainton, Marbury, Walkern, West Cranmore, Weston (Beds) (rural automatic),

and among the more important exchanges extended were :—

PROVINCES—Glasgow (South), Todmorden, Wednesbury, Woking.

During the month the following additions to the main underground system were completed and brought into use :—

Castleford—Knottingley cable,

while 77 new overhead trunk circuits were completed, and 86 additional circuits were provided by means of spare wires in underground cables.

RATIO OF LINES TO STATIONS.

THAT there is a field for investigation into methods and results on the commercial as well as on the technical and traffic sides of the telephone business, no one who has thought seriously about the subject will deny. The best-known scheme of investigation on the commercial side is, perhaps, the Development study, with which most readers will be more or less familiar. There are lesser forms of inquiry, however, which will repay a little trouble in digging out the facts and give, besides, to all who may be interested, a wider outlook on the telephone art.

One such investigation in which we in London have recently been particularly interested is the ratio of exchange lines to stations. Someone may say " not a very fruitful field to dig in, surely," but a glance at the chart appended will perhaps cause a change of mind on this point.

Let us examine the position for a moment. Away back in 1904, which is as far back as our available records go, there was for every telephone station .656 of an exchange line. To put it more plainly, for the benefit of those who, like a certain famous statesman, cannot fathom the mystery of " these damned dots," for every 1,000 stations there were 656 exchange lines. There was evidently need, therefore, for a campaign to increase extensions and private branch exchanges. This was put in hand, and one can follow on the chart the success which was attained. Orders for large private branch exchanges in hotels and stores were obtained and the value of telephone service on a large scale can be said to have been first appreciated in this period.

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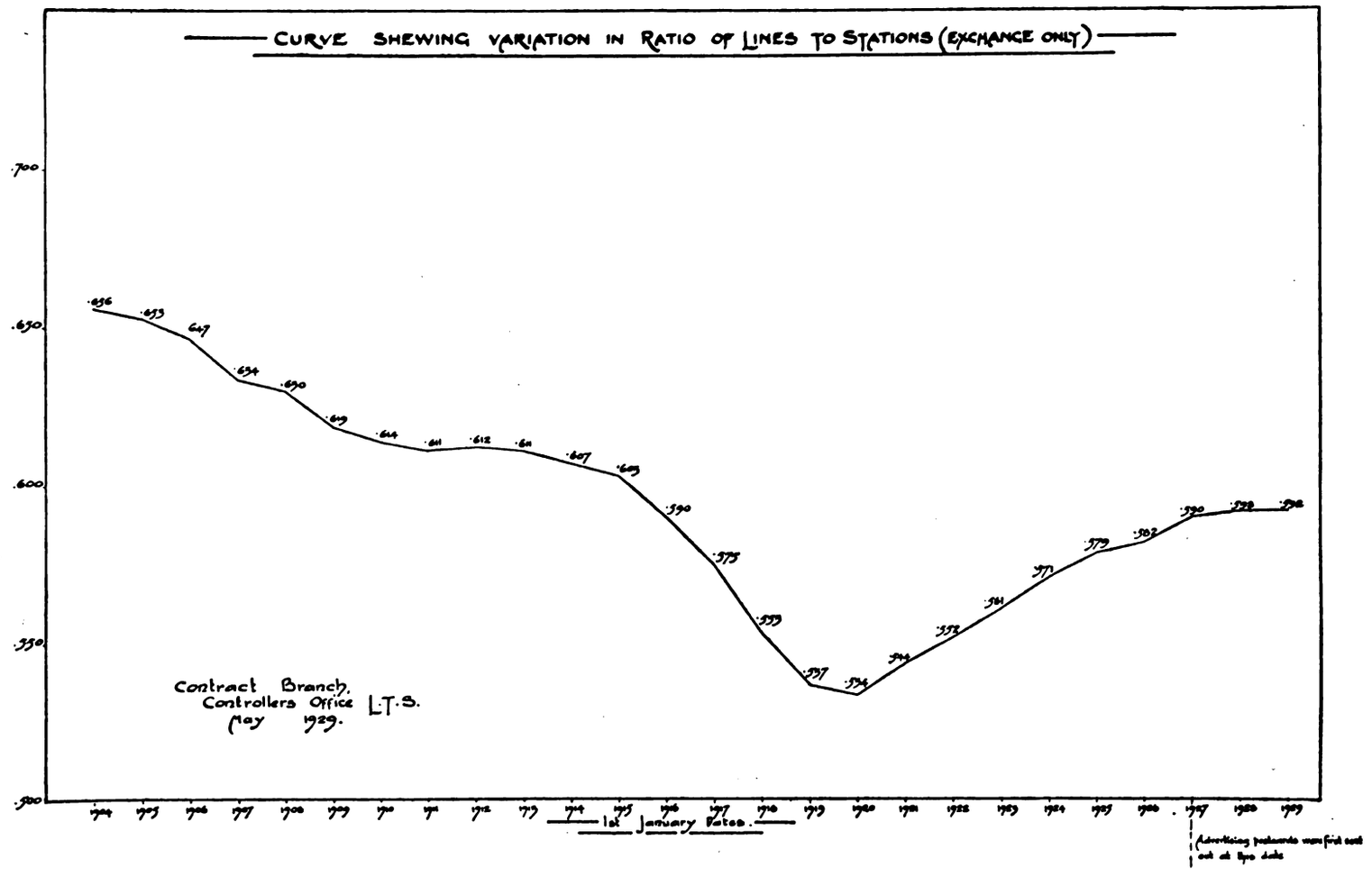

There was a slight set-back at the time of the transfer of the National Telephone Company's system to the State, and then the satisfactory downward progress was resumed.

Then came the war, and the advent of large Government private branch exchanges made the ratio plunge headlong, but the bottom was only reached in the year following the war, although the downward progress during that year was much less steep.

Then began the closing down of war-time departments, with their large private branch exchanges. Orders for others of equal importance not being obtainable the curve started to mount, and in 1926 it was considered that some drastic steps would have to be taken to bring the upward tendency to a stop. This it was appreciated was quite a formidable task owing, among other things, to the large percentage of orders for exchange lines only obtained from medium-sized houses where, in the present state of the telephone habit here, extensions were unlikely to be ordered to any appreciable extent.

Many ideas were considered, and ultimately they were reduced to three main points :—

(*a*) More intensive pressure for extensions by contract officers.

(*b*) Advertising by means of "return" postcards, through the medium of the quarterly accounts.

(*c*) "Return" postcards to be distributed freely by contract officers and with suitable correspondence.

All these methods and some others of bringing the advantages of extensions before subscribers were adopted, and have been kept up ever since with a break here and there in the sequence of postcards sent out with accounts owing to the distribution of some special circular on other matter.

On one or more occasions a special circular and the postcard went out together without making any appreciable difference to the number of orders obtained.

At first, postcards were only sent with accounts to residential subscribers having a direct line only, but latterly the scheme was extended to business rate subscribers without extensions with equally good results.

It is no secret that the first postcard sent out to residential subscribers produced over 700 extensions. A reservoir was evidently there waiting to be tapped and the first attempt was a proved success. No other card has produced such good results, but the returns are nevertheless extremely gratifying, and this method of advertising now appears to have become a useful habit.

Constant pressure on contract officers to obtain more extensions, either single ones or better still in groups, has also had its effect, and there has been a considerable improvement in this respect, but there is still room for betterment here, as otherwise each postcard issued would not produce its goodly crop of orders.

The result of all this will be seen by examining the chart, where it will be noticed that the upward tendency was practically stopped in 1927 and wholly stopped in 1928.

The outlook for 1929 is excellent if we keep pegging away by every means in our power to keep the question of extensions well before subscribers.

The staff of the Telephone Service and of the Engineering Department can do much to assist in preventing any further rise in the ratio, and even with a little additional effort and enthusiasm could help the Contract Branch to push it over the brink and well on its downward course. My last appeal to the staff fell on a hard and extremely sterile rock. Let us hope this one will be more successful.

W. F. T.

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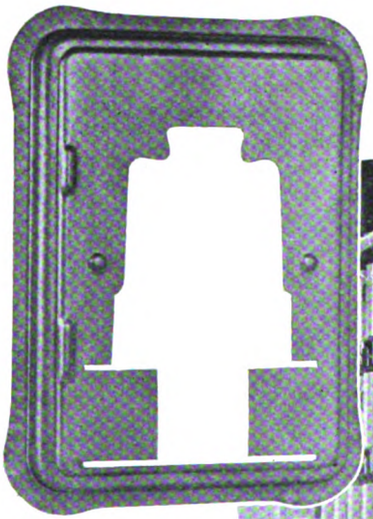
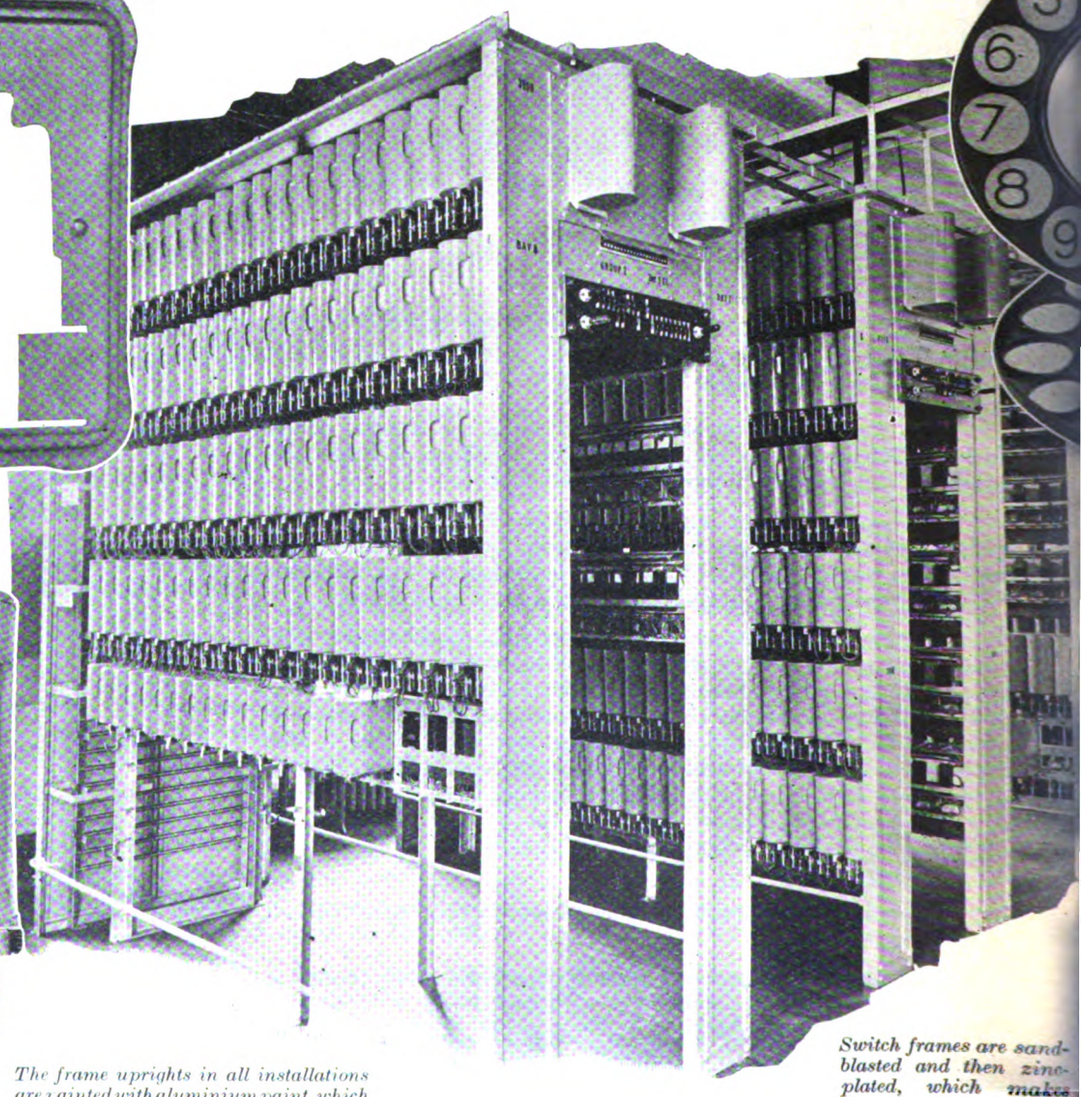
Maintaining Strowge

Special Finishes f



This telephone base is a steel punching which is first parkerised and then black enamelled

The switch cover shown here is spray finished with grey enamel, which has a high lustre and will withstand much handling



The frame uprights in all installations are painted with aluminium paint, which prevents rusting, has an attractive appearance and is very easily kept clean

Switch frames are sand-blasted and then zinc-plated, which makes them virtually rust-proof for the life of the switch

STROWGER

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utomatic Supremacy—

cial Conditions

l plate here
s black lac-
and baked,
a highly
and unus-
able coating

A CASUAL examination of the switches, frames, switch covers and the hundreds of other parts that make up a complete automatic telephone exchange, will reveal a multiplicity of different finishes. While at first glance these finishes may seem to have been selected at random, each one has been chosen for the particular part with an eye to the utmost durability under the most severe climatic and other conditions of actual service.

There is a particular reason, for instance, why certain parts are nickel-plated, some zinc-plated, some grey enamelled and others finished in black lacquer or baked enamel. Only a company with a wealth of experience in the adaptation of automatic telephone equipment to all sets of conditions can know just which kind of finish is the best for each separate part.

All of these various finishing operations are carried out in their entirety by Automatic Electric Inc. They constitute but one of the many instances which might be cited to indicate its manufacturing policy, which is that Strowger Automatic telephone equipment must be produced completely in its own factories. It is felt that in this way, and in this way only, can the quality, durability and performance characteristics, for which this equipment is noted, be properly maintained.

[This is one of a series of advertisements illustrating the exacting care exercised in the production of Strowger Automatic telephone equipment, which is thus kept constantly in advance of the telephone art.]

Automatic Electric Inc.

Factory and General Offices: 1033 W. Van Buren St., Chicago, U. S. A.

Sales and Service Offices in All Principal Cities

EXPORT DISTRIBUTORS

For Australasia -- Automatic Telephones, Ltd.
Elsewhere -- Automatic Electric Company, Ltd.

AUTOMATIC

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The
Telegraph and Telephone Journal.

PUBLISHED MONTHLY IN THE INTERESTS OF THE TELEGRAPH AND TELEPHONE SERVICE, UNDER THE PATRONAGE OF THE POSTMASTER-GENERAL.

Editing and Organising Committee - - - Lieut.-Col. A. A. JAYNE. J. STUART JONES. W. D. SHARP. J. F. STIRLING. J. W. WISSENDEN.

Managing Editor - - - W. H. GUNSTON.

NOTICES.

As the object of the JOURNAL *is the interchange of information on all subjects affecting the Telegraph and Telephone Service, the Managing Editor will be glad to consider contributions, and all communications together with photographs, diagrams, or other illustrations, should be addressed to him at the G.P.O. North, London, E.C.*1. *The Managing Editor will not be responsible for any manuscripts which he finds himself unable to use, but he will take the utmost care to return such manuscripts as promptly as possible. Photographs illustrating accepted articles will be returned if desired.*

VOL. XV. JULY, 1929. No. 172.

EXTENSION STATIONS.

THE contributor of the article on "Ratio of Lines to Stations," which we publish elsewhere, properly describes his subject as one which will repay investigation. We may also describe it as one which has not engaged to a great extent the attention of telephone statisticians—at least so far as comparative statistics are concerned. The statistics of most administrations are expressed in terms of telephone stations, and in many cases particulars of the number of main lines are not available. Nevertheless, such data as we possess go to show that the percentage of extension lines in this country is fairly creditable in comparison with the figures of other countries.

Taking first the three largest telephone-using countries, we get the following results. In fifty of the largest towns in the United States in 1925 the average proportion of main lines was 65 and of extensions 35%. (We have no later figures at our disposal, but there is little reason to suppose that the ratio has materially changed.) In Germany in 1928 there were 61 main to 39 extension stations, and in this country in the same year there were 63 main to 37 extension stations. The limitation of the data to large-city development is, of course, favourable to America in the comparision, but it is noteworthy that these three great telephone systems all yield a ratio of extension lines of between 35 and 39%. Surprise may be felt that in the United States, with their numerous giant hotels and department stores which boast a telephone in every room or on every counter, the percentage of extensions is not higher. But the explanation lies in the fact that the United States is also the country which boasts a telephone for every charwoman and chimney-sweep, and has, moreover, an extremely high telephone development amongst small residences. Wherever the residence development is high, wherever in fact the telephone is in use amongst people of every condition, the percentage of extensions is likely to be low. We have looked into the statistics of 1927 for Sweden and Denmark, the two most highly developed states in Europe, and, unlike the three great countries just instanced, possessing but one or two large cities. We find the percentage of extension stations in Sweden was 15 and in Denmark 14.

It remains to be seen to what extent the residential subscriber is an "untapped reservoir" for the spread of extension lines. Our readers will have gathered from our columns that residence rate subscribers increased at the rate of 12.1% in the country last year as against an increase of 4.4% in business rate subscribers; and the former class obviously offer the greatest field for telephone development. If, therefore, the ratio of extensions to main lines is to be improved, the improvement will have to come from that field, and we wish our contributor and his assistants every success in their efforts.

HIC ET UBIQUE.

THE Anglo-Italian Telephone Service (hitherto restricted to Milan, Genoa and Turin) was extended last month to Rome, Venice, and Bologna. Communication with the latter places will be restricted initially to subscribers in the London Telephone Area, but will be made available to the provinces in this country as soon as circumstances permit.

The charge for a 3-minute day call from London to Rome is 13*s*. 3*d*., and to Venice or Bologna 10*s*. 9*d*.

On May 31 a "through" trunk telephone circuit was opened between London and Milan; on June 11 an additional through circuit was provided to Brussels on June 18 to Berlin, and on June 26 to Frankfurt-on-Main. The total number of through circuits now working between London and the Continent is:—

London—Paris	...	22	London—Boulogne	...	1
London—Amsterdam		7	London—Bremen	...	1
London—Berlin	...	7	London—Calais	...	1
London—Brussels	...	7	London—Cologne	...	1
London—Hamburg	...	6	London—Copenhagen		1
London—Rotterdam	...	5	London—Düsseldorf	...	1
London—Antwerp	...	4	London—Lille ...	...	1
London—Basle	...	2	London—Malmö	...	1
London—Frankfurt	...	2	London—Milan	...	1
London—Madrid	...	2	London—Stockholm	...	1
London—Zurich	...	2	London—Vienna	...	1

That is 25 "through" circuits to France, 18 to Germany, 12 to Holland, 11 to Belgium, 4 to Switzerland, 2 to Sweden, 2 to Spain, and 1 each to Austria, Italy, and Denmark = 77 in all.

We encountered an old friend in the columns of the *Daily Express* last month. He is the gentleman who writes to the Editor about the backwardness of his own country, and informs him that the automatic telephone is installed "throughout"

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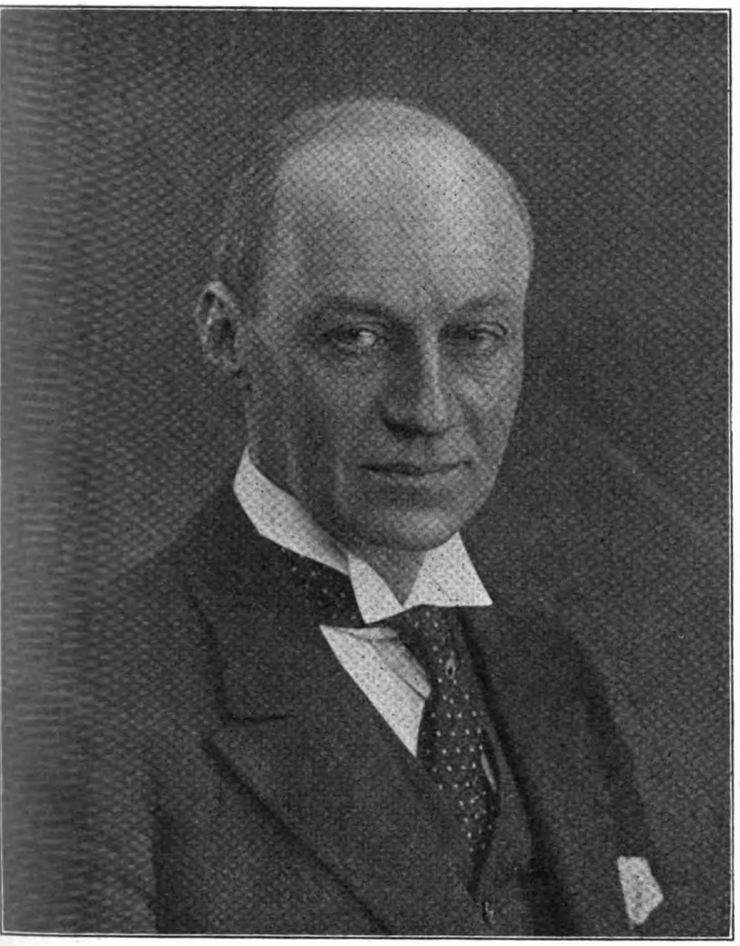

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THE POSTMASTER-GENERAL, MR. H. B. LEES-SMITH.

Germany and America. He may care to know that the automatic system is installed "throughout" Great Britain in exactly the same sense as it can be said to be installed throughout the other two countries.

Mr. Powell-Jones and Sir Algernon Law have been having a lively encounter in the correspondence columns of *The Times* on the word kiosk (or kiosque). Sir Algernon seems to be in "a state of mind"—if we may so express it—about the use of this "hideous alien word" by the Post Office. Mr. Powell-Jones scored, we think, in pointing out that Sir Algernon's letter contained a score of alien words. The head and front of the offence, it seems, is the introduction of a new "blackleg." But the word "kiosk" is by no means entirely new, and whether it is hideous is quite a matter of opinion.

Telephone service between Great Britain and the Isle of Man was opened on June 28. It was inaugurated by a conversation exchanged between the Postmaster-General and the Governor of the Island, Sir Claude Hill.

The special correspondent of the *Evening Standard* recently wrote an enthusiastic account of the foreign trunk exchange in London and of the linguistic accomplishments of the operators. With wireless services opening up wide possibilities, with new countries coming into the Anglo-European system almost every month, a few years hence may see the Trunk exchange rivalling the tower of Babel. At least, so it seems to the wandering and unchastened phantasy of the writer of the following:—

POLYGLOT.

I HEAR you calling me
in Urdu, Tamil, Bengali,
or, what is rather worse,
in Erse.
Daylong our Trunk exchange resounds
With Babel-baffling sounds.
I hear them call in Portuguese, in Spanish
(the high Castilian), Swedish, Danish,
Basque, Flemish, Finnish, Magyar, Dutch and Norse,
Polish and Czech, of course.
And while the signals wink and glow
Parisian accents flow,
"*Parlez un peu plus haut—*
Elysée, quatre-vingts virgule treize!"
Or else, in less official phrase:
"Galubchik, get me Yaroslav
or any handy Russian line you have!"
One calls, in pure Canadian, for Toronto;
another: "*Roma, mia cara, pronto*";
a third "*Die Nummer ist besetzt.*
Ich ruf' Sie wieder an . . . Sie haben jetzt
den Anschluss." Then in resignation gentle
one cries with fatalism oriental:
"From Baghdad no reply! *Bismillah!*
La haula wa la quwwat illa billah."
And if to impotence they doom us
by calls in language recondite and strange
for lands beyond our ken
outside the telephone's wide range
regretfully we answer then
in Latin: *Non possumus!*

W. H. G.

NEW TELEPHONE CABLE TO ISLE OF MAN AND IRELAND.

[*Abridged from an address given by* Mr. T. E. HERBERT, M.I.E.E., *to the Douglas (Isle of Man) Rotary Club.*]

FOR many years it has earnestly been desired both by the Manx people and equally by the British Post Office to link up the Island and the mainland by a telephone cable. That problem has

MR. W. J. MEDLYN. MR. DUDLEY STUART. CAPT. H. F. BOURDEAUX. MR. A. L. DE LATTRE.

never been dropped. To-day it has been solved by the addition to it of the need for more Irish cables. A cable for the Isle of Man alone is still, and would perhaps for ever have remained, an impossible economic proposition.

When the necessity for those new Irish cables became apparent, there were many serious engineering problems to be faced.

By the end of 1927 those had all been solved, and it was then possible to determine the cable landing points, to decide on the route and arrange the necessary wayleaves.

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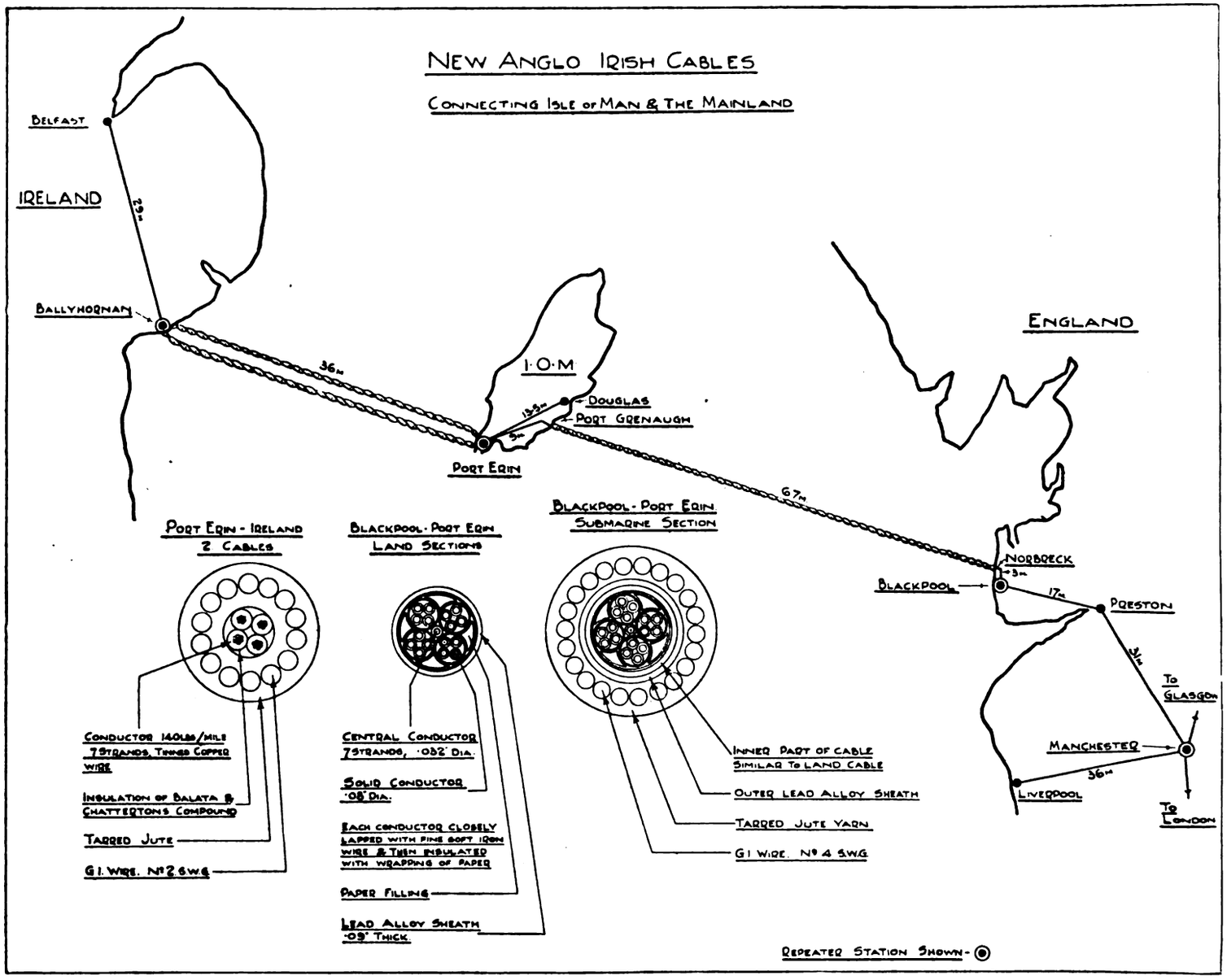

The cable which will connect Port Erin with Blackpool contains four groups, each group consisting of four copper wires. There is also a central stranded wire, but this will be used only for testing purposes between Liverpool and the Port Erin Repeater Station. Three groups of the four-wire cores are appropriated for use between England and Ireland. The fourth group is provided for the Isle of Man. It is, of course, necessary to have two wires for a telephone circuit, and so these four wires give us two telephone speech channels. But, by a simple device known as superposing, we can, in addition, obtain a third circuit also. This is done by an electrical device which causes the speech on this third channel to pass along both wires of one pair and back along both wires of the second pair.

Now as to the sea portion of the cable. There are two lead sheaths with a layer of bituminous compound between them. This is in order to ensure their watertight condition. When, due to mechanical damage, water enters the cable, it does not penetrate very far along the cable, and this is another advantage of the very close packing. The double lead sheathed cable is protected from mechanical damage by heavy armouring. The weight of the cable is about 1,250 tons.

The circuits connecting the Isle of Man and England will terminate on the switchboards in the Exchanges at Liverpool and Douglas. From the Douglas switchboard the circuits pass through a cable to the Port Erin Repeater Station. This cable has small conductors, and inductance is added by inserting loading coils (a species of choke coil) every 2,000 yards. At Port Erin the speech currents pass through a repeater and thence through the submarine cable to the Blackpool Repeater Station, where another Repeater is inserted. Onwards in a cable to Manchester, where yet another repeater is employed to transmit the speech to Liverpool. Now the number of repeaters which can, without distorting such speech, be inserted in any circuit is well nigh unlimited. Many Continental and American conversations require as many as 20 repeaters.

As to the Irish circuits, it may be interesting to tell you that the design of the cable to be used constituted a serious problem owing to the depth and currents likely to be encountered. Ultimately it was decided to lay two ordinary four-wire Balata insulated cables about half a mile apart. We shall have, therefore, four physical and two superposed circuits between England and Ireland. These will be used to form two Liverpool—Belfast, two London—Belfast, and two Glasgow—Belfast circuits.

Now just a few words about the Port Erin Repeater Station. It differs only in size from those already working in various parts of the country. Its function is to receive the attenuated or feeble telephone speech currents and to transmit onwards full strength currents precisely similar to those received. This is done by thermionic

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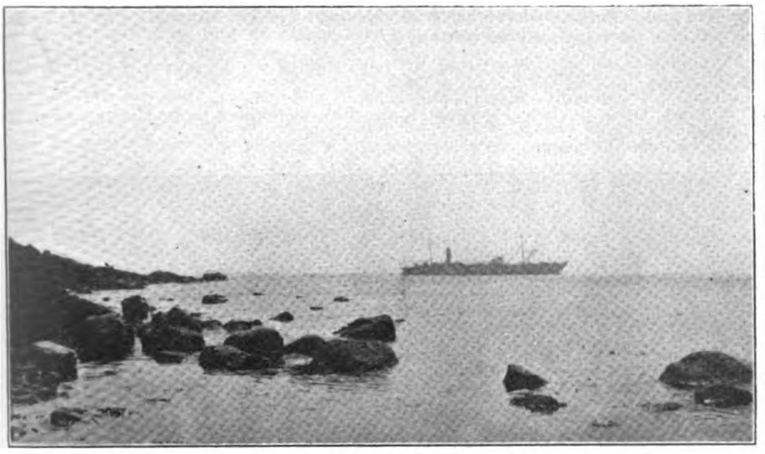
valves. But the energy required for their operation involves secondary cells and a power plant. Two oil engines capable of developing 38 brake horse-power and two 24 volt batteries of nearly 1,000 ampere-hours capacity and two 150 volt batteries of 70 ampere-hour capacity for the anode circuit of the valves and a



C.S. FARADAY AT PORT GRENAUGH.

similar battery for lighting the building are provided. There are in addition all the controlling switches and testing apparatus required to check and to measure the efficiency of the plant.

Whilst I have told you what are the arrangements for working the circuits now, you may be interested to know that the possibilities of the cables have by no means been exhausted. Each *two* pairs of wires yields *three* speech channels, but it is possible also to obtain

CAPT. ROBT. ALLAN OF THE FARADAY.

LOWERING CABLE BUOY (ROUTE MARKING).

additional channels on the same circuits by using an alternating current having a frequency of 7,000, which is beyond the highest frequency necessary for speech transmission. This current is modulated by varying its amplitude in accordance with the ordinary speech currents. In this way it is possible to obtain an extra channel. By adding other higher frequencies still more channels become possible. This, however, involves considerable complications in the apparatus arrangements and still more problems in telephone engineering.

THE TELEGRAPH SERVICE IN 1950.*

BY JAMES J. TYRRELL.

ABOUT two years ago, Sir Henry Bunbury, from this platform, made the following appealing statement in connexion with Telegraphy in general and the Telegraphs of our own country in particular.

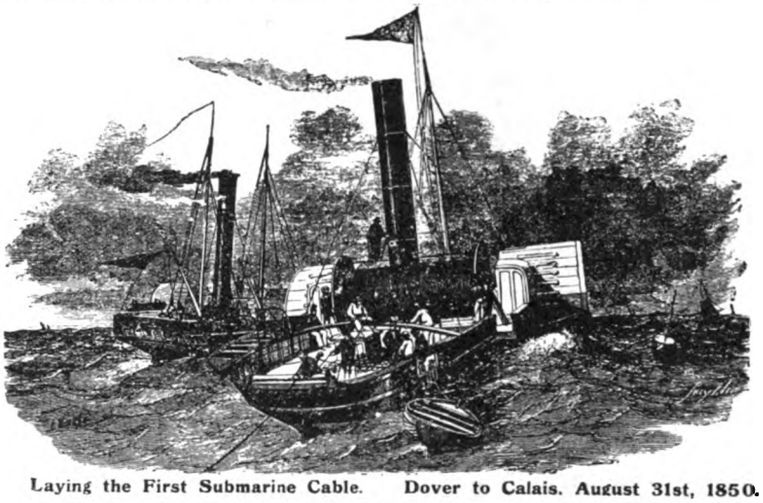
"I do not want so much to know," said Sir Henry, "what the Telegraphs were like 20, 30, and more years ago, but what I would like to know is what will they be like 20 or more years hence."

In taking this opportunity of fulfilling a promise to our esteemed Accountant-General, and in presenting something in the nature of a reply to his question, I must admit to considerable diffidence this evening in even attempting to assist one whose general knowledge and widely recognised ability overshadow most of us.

However, sometimes the mouse may be able to help the lion.

The mouse proceeds! Without so soon forgetting the prohibition regarding "the dear dead days beyond recall" of the telegraphs, let me commence by projecting a few pictures of past telegraphy upon the screen. I think, by giving a very brief backward look, we shall be the better able to obtain a truer perspective of our subject. It will remind us of the pioneer work done in this country, and of the very solid fact that telegraphy under British administration has not stood still for long. It has, at the moment, certainly reached a critical point in its history, but it is not a dying industry by any means.

Fig. 1 marks an epoch in the history of cable telegraphy, and shows the pioneer act of laying practically the first submarine cable between England and France—actually between Dover and Calais in August 1850.



Laying the First Submarine Cable. Dover to Calais. August 31st, 1850.

FIG. 1.

At this time the Inland service was already a going concern in the hands of private companies, the railways included, and there were working wires along the London, Chatham and Dover Railway which gave communication between these termini. The actual link between Dover and the English end of the cable was not complete until November 1852, traffic between Paris and London being man-handled over for re-transmission in both directions until the date just mentioned.

The actual ceremony is depicted (in Fig. 2) in a room at No. 30, Cornhill, where the artist of the *Illustrated London News* made a sketch of the scene on the premises of the European and Submarine Printing Telegraph Company.

That was nearly 20 years before the transfer of the Inland Telegraphs to the Post Office, and 47 years before the bulk of the Anglo-Continental circuits were merged into Government hands, because of their inefficiency.

Jumping the historic year of the Inland Transfer, we come to 1891, during which period the Press took considerable interest in the Government-owned telegraphs. This interest was, no doubt, augmented by the fact that the expansion of the Anglo-Continental services, subsequent to their transfer in 1889, had necessitated the removal of their headquarters from Throgmorton Avenue to St. Martins-le-Grand two years later.

Hence a publicity the like of which I do not recall until last year—only that was in another direction!

Those were the days of Morse sounders and high-speed Wheatstones, aided, on certain minor circuits, by a few single needles, double-plate or bell sounders, and A.B.C.'s. It was at this period that the experimental 6-channel Delany Morse Multiplex was introduced, an invention which deserved a better fate than extinction.

From Fig. 7 you will have observed that less than 40 years ago accumulator or secondary cells had not yet come into their own, primaries being used

* Paper read before the London Telephone and Telegraph Society.

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for all circuits, main and local. They were accommodated in the basement of the C.T.O. on shelves the total length of which was well over 2½ miles. It is not possible for the present generation to realise how great was the boon when secondary batteries were installed.

Very marked as had been the improvement in the standard and upkeep of the overhead lines, after the transfer of the Inland telegraphs to the Post

FIG. 2. OPENING THE FIRST DIRECT TELEGRAPH CIRCUIT BETWEEN LONDON AND PARIS, NOV. 9, 1852 (*Illustrated London News*).

Office, quite an appreciable mileage, at this date, was still well below the insulation standard of to-day, while the underground wires were gutta-percha covered, also of comparatively low insulation, and of heavy capacity effect—vastly different from the air-spaced, paper-insulated, multicore, lead-sheathed cables of the present century, which provide some 100% more conductors in the same underground space. Even this progress may appear slow when gauged by post-war standards, but the Telegraph Service of Great Britain by that time had made distinct advances as regards the expeditious disposal of its traffic, the quality and improvements in its telegraph apparatus and the construction and maintenance of its lines. It was a model for our colonies, and for the greater part of the world. The next two decades saw still further developments in construction and a still higher standard of excellence in maintenance.

FIG. 3. CENTRAL TELEGRAPH OFFICE, LONDON (CENTRE), G.P.O. NORTH IN COURSE OF ERECTION BEYOND (*The Engineer*, Dec. 1891).

Practically coincident with these developments there came the movement in the trial and adoption of high-speed, type-printing telegraph apparatus, due to the perfectly correct policy of getting the most out of a conductor and thus saving wires. By a strange freak of circumstances the first type-printing apparatus to be worked extensively by the Post Office was the Hughes, introduced by the Submarine Company at its transfer in 1889, about the only good thing—except the staff—which came over with that transfer.

Of the systems subsequently tried and tested there were undoubtedly more than one or two which have given excellent results, but their success has not been consistently maintained.

That is still the position to-day. Ingenious, excellent, line-saving inventions, the potentialities of which have been tried out successfully in laboratory, workshop and under working conditions.

Stable battery power, an exceedingly high standard of line and line maintenance, certainly unsurpassed on the Continent of Europe—and a staff whose adaptability to new conditions has never seriously been challenged.

Yet, despite these promising factors, the Telegraph Service of Great Britain is admittedly not what one would call popular. This is, unfortunately, reflected in adverse financial results, though the latter is certainly not entirely due to the quality of service given. I would, indeed, stoutly maintain that the Telegraph Service of this country does not deserve anything like half the hard things that are said concerning it.

Nevertheless, with our usual British candour we all admit that it is not as near perfection as we would all wish to see it.

What, then, in these circumstances, may we expect to be the position in another 20 years ?

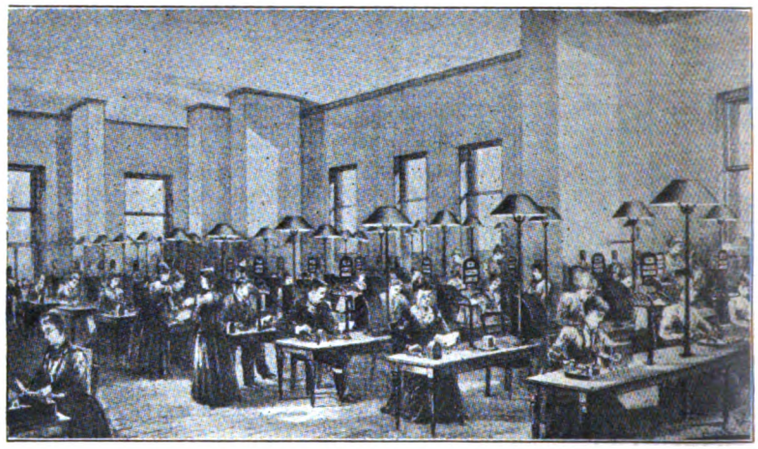

FIG. 4. C.T.O.—A PORTION OF THE METROPOLITAN GALLERY.

Let us note down the forces which are operating and are likely to operate against the progress of the Inland Telegraphs.

Forces operating against the Telegraphs :—

(1) The competition of the Telephone
(2) The competition of the Post.
(3) The heavy cost of delivery and the retarding effect of the natural attempts at economy at this particular stage of a telegram's transit.
(4) The disappointing results of high-speed printing telegraphs in this country.
(5) The failure to popularise the Telegraphs or to rebut in any way the uninformed criticisms of the Press.

With regard to Nos. 1 and 2, it will undoubtedly prove an accurate prediction that both these forces will continue as competing factors.

The Posts, the Telegraphs and the Telephones are all actually transport services, and, with the changes which have been brought about by modern scientific discoveries and human ingenuity, it is inevitable that one should from time to time intrude upon the province of the other.

FIG. 5. GENERAL VIEW OF PROVINCIAL GALLERY.

Eventually each will find its own economic and utilitarian sphere in the scheme of things.

Indeed, in studying the whole of the communication and transport services, road, rail and canal included, it is interesting to find that there is a definite point where even the slowest means of transport, from one cause and another, has a very definite economic value.

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Thus, even canals are coming into their own again, while horse-haulage is still the cheapest for certain work. I note that, with the local horse-drawn dust-cart, the driver is able to assist in emptying the dustbins, while the stop-start is left to the intelligent beast in the shafts as the vehicle moves from door to door, while a specially constructed motor-lorry periodically visits the collecting area with empty dust-carts, exchanging these for the horse-drawn filled vehicles, which are then rushed away to the shoot.

That the present critical position of the internal telegraphs, not only of our own country but of other European countries, is part of a general readjustment of values there can be little doubt. That small countries, such as Switzerland, with an efficient telephone service covering a fairly dense area, have seriously felt the loss of telegraphic traffic appears to confirm this.

It may, therefore, be stated somewhat definitely that for short distances, say up to 20 miles, the telephone will always prove superior to the telegraph, except in about 20% of such traffic where (*a*) documentary evidence is an essential as well as speed, and (*b*) where the addressee is not a telephone subscriber.

This latter traffic will naturally be a declining value, actually to be reduced to nil so soon as the telephone shall have reached the 100% point of absorption. Long before this is reached, I should not be surprised to see the disappearance of the telephone surplus.

With the disappearance of the surplus and the addition of some thousands of subscribers, the question of increased rates may justifiably arise. After all, the addition of every new subscriber increases the potential value of one's telephone. The essential point, however, remains that, even should an increase of tariff prove practical or politic, momentarily this might assist the telegraphs, but it would not, *could not*, last. The telephones would soon

FIG. 6. C.T.O.—GENERAL VIEW OF ANGLO-CONTINENTAL CIRCUITS.

forge ahead again, but this very progress of the 'phones, I should not be surprised, will actually and eventually act as a permanent reviver of the telegraphs, as I hope to show.

(2) *The Competition of the Posts.*

"A strange proposition," some may say, but I venture to suggest, for careful consideration, that competition from this quarter is likely to prove a very real one in the future. We must not be blind to the transport developments around us. Can we not visualise the initiation of a new kind of express letter at a much cheaper rate than that at present possible? Let us say a 15-minutes motor service between all large towns by way of the public high-speed motor roads which, running out of our large towns and cities by means of viaducts, will in future enable fast traffic to leap the congested centres into the urban districts and so on. Such a service would be able to deliver express letters well within an hour between, say, London and Brighton, Southend, Romford, &c., and at a much smaller fee than that at present demanded for the same service, say, between Hampstead and the City.

Such a postal service will wipe out 50% of the telegraph traffic between London and 60 miles round. Alternatively, is it a mere guess to say that within the next decade it will be easily possible for small aeroplanes (say, of the gyroscopic type) to land upon and to take-off from the roofs of even moderately-sized post offices?

What is to stop the Postal side from initiating an express letter service by *this* means?

Express tubes specially built for high-speed travel are no mere dream. They will arrive, and it may come to pass that it will be quicker to go home and tell your wife that you are not coming home than to telegraph or even telephone her!

In 1924 Mr. Donald Murray's view was that the telegraphs in this country have suffered from the pressure of the telephones on one side and of the Postal Service on the other.

Mr. Archibald, fresh from his delightful trip to America, confirmed this economic reaction in the reverse direction, when he stated that a contributory cause of the *success* of the telegraph services of the United States was the indifferent standard of the American Postal Service. We can, I think, accept the broad principle that an expeditious and *cheap* postal service is bound to have reactions upon a dearer, even though 100% more expeditious *telegraph* service.

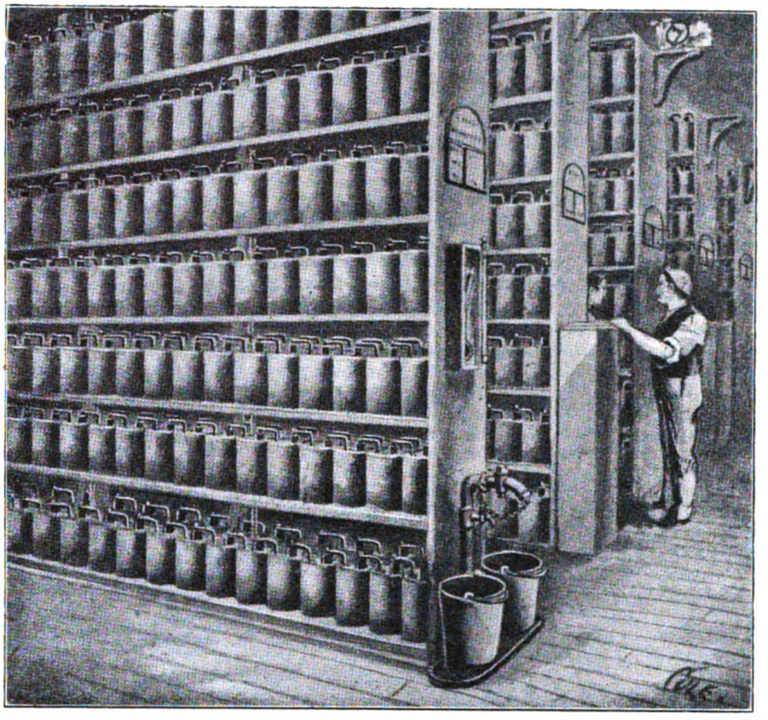

FIG. 7. BATTERY ROOM.

I do not for one moment suppose that the Mails Branch has placed the stamp of finality upon its activities. The Postal side is saying good-bye to much of the slower means of transport, both human and equine. In our picture of the C.T.O. in 1891 we noticed a horse-drawn postal van coming out of the G.P.O. East yard. Six years after that picture appeared, the Postal side had already considered the possibilities of accelerating its services by means of contracted internal combustion-driven vehicles. The war period held back developments, but 1919 saw a bigger stride when the Post Office became effectively a motor transport *owner*. At the moment the Mails Branch has a staff of no less than 4,000 postmen motor-drivers, their number and that of the machines growing every week.

Assuredly such new "air" and "road" services as I have adumbrated would not present any real difficulty to the Postal Department of the British Post Office. Someone asks, "Suppose these services were *not* initiated by the Post Office?" The result, so far as the telegraphs are concerned, will be the same, for private enterprise will naturally seize on these obvious facilities for more rapid services, and either urge them upon the authorities or itself exploit them. The small aeroplane will prove remunerative as a messenger and carrier to all large organisations between its factories and offices, &c., while the taxi aeroplane will, no doubt, arrive.*

FIG. 8. DELANY MULTIPLEX.

Undoubtedly the human organism of the future will be more and more attuned to the high speeds of to-day, and to those of to-morrow, still higher.

The average intelligence and the general knowledge of the population will also be such that neither wire or wireless telegraphy will any longer mystify the man in the street.

* Since this paper was delivered, a taxi service has actually been opened near London.

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The criticisms, too, of the average person of the future will certainly be better informed than they are to-day. This will be all to the good as regards an efficiently-run telegraph service, but rather a sad case for any service below that of first class. With the swifter standards of air and road transport, with the personal touch with wireless apparatus and fairly clear conceptions of the speed of a telegraph signal, 1950 will demand something decidedly in advance of to-day's criteria from the telegraph service, whose transmission speed is measured not by a few score of miles per *hour*, but by thousands per second.

The business man of to-morrow will not accept the excuse that the transit time on a foreign telegram in England was only 30 minutes as against 60 minutes on the Continent, the obvious retort being "All the more reason to speed up this side of the Channel."

(3) *The high delivery cost of a telegram.*

This particularly heavy handicap of the telegraphs of this country is generally acknowledged. The solution of prompt delivery at low cost will not, in the future, be met by the walk system, or even by a premium on the number of telegrams delivered per messenger.

In passing, one feels bound to emphasise the fact that the difficulty of expeditious delivery, unless it be to a comparatively small group of telegraph users, within a comparatively restricted area has never devolved upon the private companies in this country. To the State organisations has been left the exclusive privilege of dealing with this, the most expensive individual item—that of delivery to the suburbs, the smaller towns, the villages and the remote hamlets of the United Kingdom.

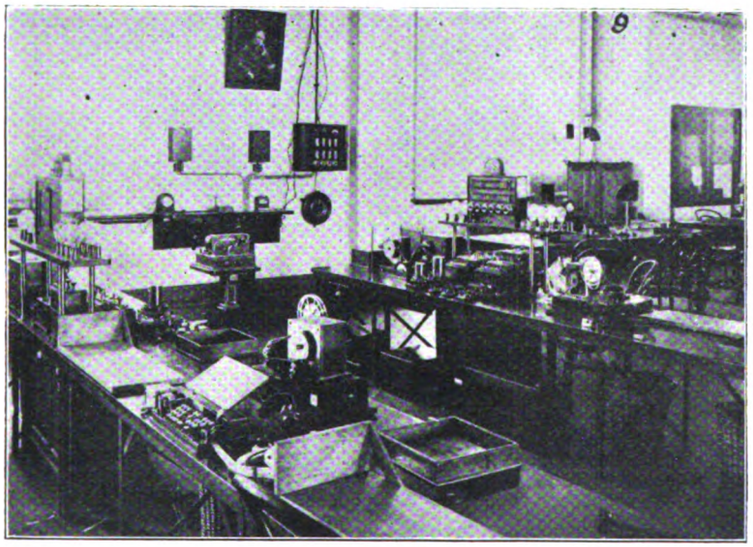

FIG. 9. CHRISTCHURCH AND AUCKLAND MULTIPLEXES TERMINATING IN WELLINGTON, N.Z. KEYBOARD PERFORATORS AND AUTOMATIC TRANSMITTERS. WHEATSTONE LEAK FOR TESTING FAULTS ON SETS.

I have no information as to the transit times of telegrams well outside the large cities of the U.S.A. with which to make comparisons, and Americans are rather silent on the quality of their telegraph services *outside* the larger cities.

(4) *The disappointing results of high-speed printing telegraphs in this country.*

These results are admittedly disappointing because of a certain degree of instability which so far has accompanied their installation.

The disconcerting feature of these difficulties is undoubtedly the indisputable fact that similar, and in some cases identical, types of telegraph apparatus work all but unfailingly hour after hour in other countries.

In Russia—my latest information is dated December, 1926—50% of the Moscow traffic is dealt with by means of double and quadruple forked Baudots. Start-stop mechanism has also been adapted to certain Baudots by Mr. Kaoupouge. The Russians introduced the multiplex as far back as 1906, the year succeeding that in which a small expedition from the C.T.O. installed Baudot multiplex between Calcutta and Simla with Allahabad intermediate, between Calcutta and Madras, and also between Madras and Bombay. The terrain and atmospheric conditions are by no means easy, but these and many other circuits similarly equipped have worked satisfactorily year after year, the Madras-Bombay circuit carrying heavy code traffic. The mechanics were selected and trained natives.

In the U.S.A. also, as we all know, multiplex with keyboard perforators and automatic transmitters have given excellent results for quite a lengthy period, and they have not stopped at that. In New Zealand, multiplexes of the same distributor type have been for some years the mainstay between Auckland and Wellington and Wellington and Christchurch. On these circuits more than 50% is in letter code, but the stoppages are few and brief, and the working hours are sometimes 23 hours out of the 24.

These facts are none too flattering to one's telegraph pride as against the complaints one hears concerning the home service, and in view of the high place which telegraph development in the old country has held in the past.

(5) *The failure to popularise the home telegraphs or to rebut, in any way, the uninformed criticisms of the Press.*

This last feature is thrown into greater relief by the booming and publicity given to the telephones. One has no narrow or foolish, jealous regrets at the progress of the telephones, but the telegraph man does somehow, sometimes, feel that if only a few crumbs of this publicity and endeavour to meet the public could have been spared for the telegraphs, the present condition of affairs would not have been so parlous.

The result of this apparent neglect has had a very serious psychological reaction on a staff which, proud of its craft, feels that it is undefended, must not attempt to defend itself to the public, and that nobody cares for a dying industry. The Inland service also notes the canvassing efforts and the personal touch employed in connexion with the Anglo-Continental cables, and again feels that it is a neglected service.

This will, no doubt, be remedied in the near future, but that it is a very real factor in reducing the *quality* of the service is undeniable. I know full well that telegraphists as a body work for something more than the mere pay they receive, welcome as that may be.

I cannot envisage an administration of the future ignoring this craft spirit.

Does the position look hopeless as regards the future? Emphatically not. The Telegraphs is not itself a dying industry, but a growing one, viewed on the grand scale and the wide horizon.

(To be continued.)

GLASGOW TELEPHONE NOTES.

ON Monday, June 17, a happy party of about 100 went for the annual trip provided by the staff for the wounded or disabled service men still attached to the hospitals in this district. This year the outing consisted of a motor run from Glasgow to Luss via Helensburgh, a "voyage" on Loch Lomond from Luss to Balloch, tea at Balloch Castle, and thence back to Glasgow. There were boys from the Bellahouston, Erskine, and Ralston Hospitals, and the way they enjoyed themselves was ample reward for the trouble taken on their behalf. If only our contributors could have seen what joy resulted from their weekly subscriptions they would feel more than ever that the idea was well worth while.

The party was accompanied by Mrs. Col. Westbury, Mr. and Mrs. Currie, Mr. and Mrs. Coombs, Mr. and Mrs. T. S. Ward, Misses Kay, Gray, Newlands and Horrocks. Mrs. Westbury presented the prizes won in connexion with the putting and balloon competitions.

Miss M. E. Colquhoun, of our Central Exchange, has just returned from a holiday in Paris. During her visit to the Gay City she visited the Ségur and Vaugirard Exchanges and has returned to Glasgow thoroughly charmed with her reception and treatment by all whom she had the fortune to meet in connexion with the telephones "over there." Miss Colquhoun is just bubbling with enthusiasm and thanks and cannot speak too highly of the courtesies extended to her. May we of the Glasgow Office join with her in expressing our appreciation and, by the same token, voice the hope that we shall some day be able to reciprocate.

Will the Paris papers please copy?

What is known as the "May Removal Term" has a special significance so far as this district is concerned. In effect it means that changes of residence are chiefly concentrated into a short period round about May 28 each year instead of being spread over the different quarters as it is "over the border." This year of grace provided something of a record, for no less than 2,156 removals were involved. It is a matter for congratulation that a period of considerable stress was met and surmounted with little or no service difficulties, despite the coincidence of added pressure and special arrangements consequent upon the General Election.

During our recent series of telephone lectures the following extract from a letter was very well received:—

> "I was only joking when I said that I didn't mean what I said about reconsidering my decision not to change my mind. I really mean this!"

What did the writer really mean?

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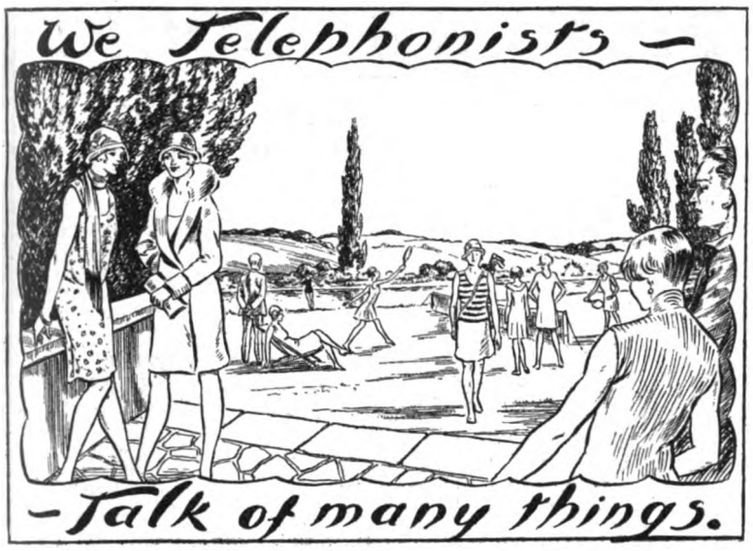

The Road Opposite.

So many of the tasks which we set ourselves to do depend upon the atmosphere with which we are surrounded. Bodily comfort promotes that security of mind out of which proceed the gentler philosophies. The wearing of a hair-shirt tends to produce the series commencing "Thou shalt not," and the wearing of a soft shirt (or, indeed, no shirt at all) tends to produce the mellower permissive series. Whether or not you will agree with the first pronouncement I do not know, but you will probably decline, with becoming modesty, to be drawn into a discussion as to the truth of the second and its parenthesis.

Behold me, then—well, almost shirtless—on a sunny verandah in a deep easy-chair with soft cushions and a pipe which is drawing pleasantly. Yet, despite these creature comforts, I find it difficult to settle down. There have been times when I have found it next to impossible to settle up, but, on this occasion, the task of settling down is even more difficult. The pen is ready to flow, and the fair sheet of paper, virgin in its purity, awaits its caligraphical martyrdom. But I cannot settle down because of that road opposite. Ever and anon I find that my gaze has lifted from the paper and is resting contemplatively on the road opposite.

It is doubtless quite an ordinary road, and occasionally a solitary figure moves along it, but it seems to have no beginning and no ending. Down across the lawn past the sundial (where the rabbits are feeding), across the small field where the black rocks poke through, are trees, and it seems as though that road must be born among them. At any rate, where the trees break away there is the road, a narrow ribbon gleaming between the hedges, and then it dies away in a further clump of trees and is lost. Lost, do I say? —well, no. I fancy not, for is there not a faint path going forward up the hill across the field and—yes, a stile in a low stone wall. Beyond that the path must be hidden by another stone wall which runs at right angles to the first and stretches up to the top of the hill, because, on the skyline, I can see a gap in the wall.

Of course, it is very foolish to allow one's thoughts to be distracted from the business in hand by a very ordinary road, a meandering footpath and a matter-of-fact gap on the skyline, but the whole thing fascinates me—particularly the gap. There must be something other than sky and cloud beyond the gap, and if I were not so busy, I would just walk those few miles to settle my conjectures. Quite apart from that, what would people say if I rose suddenly from the depths of cushions and walked on such a hot day, merely to satisfy an idle curiosity. And I know very well that, once I forsake this shady and luxurious ease, one, even more slothful than I, would bag my place of vantage. "To-morrow, perhaps," I murmur to myself, and the gap hears and mocks me with its vacant grin. "Or the day after," I continue deceitfully, "or possibly in the cool of to-day," I add weakly. "Oh, hang it! I must go now, and through the gap into the land of imagination." And so I fell asleep!

PERCY FLAGE.

Elizabeth Garrett Anderson Hospital.

I am sure that all the kind folk who worked so hard last year in preparing various articles for the different bazaars, arranging dances and assisting in endless other ways to collect our £2,000 would have been amply repaid for their labour, had they been able to share in my pleasure of observing the wonderful results obtained.

Although my literary efforts are not of the best quality, it would be kind of you to bear with me for just a little while, and perhaps I could give a little account of the good fortune it was mine to enjoy.

It was two o'clock on a Wednesday afternoon, and two girls (who had the luck to be present at the opening ceremony), and myself made our way through the dense crowd of people who were waiting outside the hospital to welcome Her Majesty the Queen. After a struggle we reached the hall, and there, after two policemen and two commissionaires had viewed our tickets, we were allowed to enter. We arrived early, and we were fortunate in getting seats almost directly opposite the position the Queen would take when performing the ceremony, so, being well to the fore, as all good telephonists should be, we settled down comfortably in our seats to study our programme, listen to the band of H.M. Coldstream Guards and, incidentally, study the new spring fashions. At about three o'clock hoarse cheers were heard, and the bells of St. Pancras sent out a merry peal of welcome, and we, feeling very thrilled, waited breathlessly, as we knew this must be a signal that Her Majesty was near. A moment more, and the band commenced the National Anthem, and Her Majesty, looking the most regal of Queens, entered, escorted by Mr. A. Gordon-Pollock, the Chairman. Her Majesty was conducted to a seat on the flower-decked platform, and was there presented with a bouquet (the flowers were so arranged that they formed a fan) by the little granddaughter of the Chairman. The Chairman then addressed Her Majesty, and thanked Her Majesty for sparing part of her valuable time in attending the ceremony. In the course of his address, the Chairman stated that the Hospital was founded in 1866 by one Elizabeth Garrett Anderson, from whom it derives its name. Since 1866, rapid strides had been made, new buildings had been acquired (this being made possible by the generous donations of sympathetic patrons), and now in 1929, the existing Hospital had been entirely reconstructed and equipped on the latest scientific lines, and a new wing added, which included (1) two surgical and medical wards, with sun balconies, 18 beds in each, (2) a maternity ward, (3) a children's ward, (4) two operating theatres, (5) an enlarged out-patients' department, with its own operating theatre, and (6) a new X-ray department; and the Chairman added that this Hospital was the first in the Empire to be devoted entirely to the interests of women and children. Her Majesty was then asked to receive a basket of jewels, and also to receive purses, the contents of which had been subscribed by various sections of women and children. One by one the representatives of the various sections made their curtsey and presented their purses, until we heard the Chairman announce "Miss Cox—Women of the Telephone Exchanges in London," and then we sat forward and eagerly awaited the supreme moment. Miss Cox made a graceful curtsey and presented the purse to Her Majesty. We applauded, and I could not help but wish that all those who had worked so hard had been with us at that moment. After the presentation, Her Majesty was offered the golden key of the wing by the architect, and Her Majesty then declared the wing open. Her Majesty was then asked to inspect the new wing; to this Her Majesty consented, and was escorted from the hall. We were then entertained to tea, which we did full justice to. The only thing is, I hope the waiter will never recognise me, or the consequences might be serious. After Her Majesty had taken her departure, we had the privilege of viewing the new wing. It was here we saw and realised the wonderful result of our contribution toward the building and equipping of this wing. What struck one so forcibly when entering the wards was the brightness, cleanliness, freshness, and, above all, the homeliness. Each of the wards we inspected had its own colour scheme, and there was none of the orthodox pink flannel and dark brown blankets one usually associates with hospitals. Every bed was fitted with a wireless set (it may, perhaps, be remembered that this was made possible by subscriptions from members of the L.T.S. a few years ago), so that patients could while away many an hour that might otherwise have proved irksome. We then visited the Children's Ward, and here, again, there was no lack of cheeriness and colour; and the wonderful collection of toys must, surely, have brought happiness to many little sufferers. Walking through the white-tiled corridors, we made our way to another section of rooms, which, on inspection, were found to be the operating theatres, anaesthetic and dressing rooms. Each room proved very interesting, and one item in the operating theatre particularly so. This was a large cabinet filled with bright shiny scissors, knives, and various other appliances of every conceivable shape and size! I am sure a finer collection of silver could not be found anywhere. It was not without a certain feeling of relief that we made our exit and passed on to the sun balcony. Here, high above the noise and dust of the streets, we rested; and, as I thought over the events of the day, I realised what a wonderful thing it was to have one's health, and how worth while it seemed to be able to say, with many others, that I had helped (even, perhaps, only in a small way) in assisting those less fortunate to regain their lost health and strength.

A. A. ROBINSON, *Langham Exchange*.

The Presentation to Mr. Valentine.

"I shall always have the thought of this evening singing in my heart." These eloquent closing words of Mr. Valentine's speech on the occasion of the presentation to him of tokens of regard by the London Telephone Service Staff on his retirement fittingly embody the spirit of the great gathering, representative of all ranks, which assembled at G.P.O. South on Friday, May 31, to do honour to our late Controller; not so much to say "good-bye" as to tender our heartiest wishes for his long enjoyment of that leisure which is the due reward of faithful service to the State.

The actual presentation was preceded by a reception and refreshments, to the accompaniment of music by the Eureka Orchestra, under the direction of Mr. A. G. Dunn. In addition, a musical programme was contributed by well-known artistes, including the Misses Beare and Worth, Captain Hemsley, and Mr. Hugh Williams—the quartette which has done such good work in providing entertainment for the inmates of the National Sanatorium at Benenden.

Mr. Napier, our new Controller, who received an enthusiastic ovation, made the presentation, the gifts including a wireless set, a writing table with

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accessories, and a set of toilet requisites for Mrs. Valentine. Mr. Napier showed how closely the life of our late Controller had been associated with the Telephone industry in this country, paying many tributes to those qualities which had won Mr. Valentine the respect and regard of his staff and of his other colleagues in the service; concluding with a humorous reference to the part played by the official files in providing a constant memorial of absent colleagues by enshrining their signatures and recorded judgments for all time!

Mr. Valentine warmly and eloquently acknowledged the gifts presented to him, speaking in feeling terms of the goodwill of the staff so clearly evident in the great and representative gathering then assembled. He looked back upon his lifelong association with telephones as a happy and fortunate association; and though the time had now come to sever the old bond, he could now, in the time of leisure that was coming, answer the old calls of travel, literature and art as never before. In conclusion, Mr. Valentine again referred to the great gift of goodwill, in the eloquent phrase already quoted. Tumultuous applause and the singing of "For he's a jolly good fellow" marked the conclusion of Mr. Valentine's speech.

The presentation to our late chief is memorable for the entire absence of that element of gloom which sometimes characterises such functions. While all retirements have their element of sadness, there was something definitely inspiring in the knowledge that Mr. Valentine still looked forward—not backward—enjoying with all the zest of youth the anticipation of the alluring possibilities of his period of "extended leave." It is betraying no State secret to say that, in full accord with this spirit, Mr. Valentine, no less than his colleagues, thoroughly enjoyed the following parody sung by Captain Hemsley, to the tune of "Hearts of Oak":—

Come, cheer up, my friends, we've a part still to play,
To give the Controller a send-off to-day;
'Tis a smile we must show him, our sorrow to spurn,
For surely we know he will often return.

When he bids us adieu, we must make it quite plain,
If he would not hurt us, shun or desert us,
He'll have to come back here again and again.

The 14th of Feb., I am happy to state,
Will always be kept as a popular date;
While at Ilford the subs. have no cause to repine,
For right in their midst they retain Valentine.

And we'll smile through our tears and make light of our pain,
And give him fond greeting, at our next meeting,
And welcome him back here again and again.

Our faces are White, but we vow not to shrink;
And when he returns, may it be in the Pink.
If he'll Dive in our hearts he a Corner will find,
His Bold, Stirling worth there for ever enshrined.

And a Mantle of love he will always retain:
We miss him, we Newitt, sadly we rue it,
But wish him good fortune again and again.

And so say all of us.

P. W. H. M.

Psalm of (Auto) Life.

With apologies to Longfellow.

Tell me not in daily lectures
Of the subs. who dial O,
For it passes my conjectures
Why this System wills it so.

Well we know there's trouble brewing,
As upon their calls we wait—
When they find there's nothing doing,
Up they come with voice irate.

They are like dumb driven cattle,
When they've dialled 9 for "fife,"
So we aid them in the battle—
Isn't ours a lovely life?

If "your dial's out of order"
Is the term to be employed,
We may drive them o'er the border—
Line of reason, when annoyed.

Though we be both kind and gentle
When we bid them "dial Toll,"
If the sub. is temp'ramental,
He may still go up the pole!

Supervisors all remind us
We'll get used to it in time—
(And remonstrate if they find us
Wailing forth our woes in rhyme!)

C. A. S.

Contributions to this column should be addressed: THE EDITRESS, "Talk of Many Things," *Telegraph and Telephone Journal*, Secretary's Office, G.P.O. (North), London, E.C.1.

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LONDON ENGINEERING DISTRICT NOTES.

The Institution of Electrical Engineers.

The Council of this Institution has awarded a Special Premium (value £10) to Capt. J. G. Hines for his paper on "The Anticipation of Demand and the Economic Selection, Provision and Lay-out of Plant (Telephone Systems)." This paper and the discussion thereon appeared in the Journal of the I.E.E. for the month of May, 1929. The economics of engineering is of vital importance and this paper should be read by all interested in the telephone industry.

Promotions.

The following promotions affecting the London Engineering District have been recently announced :—

Mr. H. W. Fulcher, Executive Engineer, to be Assistant Superintending Engineer.

Messrs. H. O. Aspinall, H. C. Gray, J. H. Watkins, and L. J. Jones, Assistant Engineers, to be Executive Engineers.

Mr. Aspinall remains in the London Engineering District, Mr. Gray goes to the South Midland District, Mr. Watkins to Bangor, and Mr. Jones comes to the London Engineering District.

Transfer.

Mr. W. Deane, Executive Engineer, Leicester, has been transferred to London Engineering District, where he will be in charge of the C.T.O. Section.

Fire in the Embankment Subway.

On the evening of June 6 a fire broke out beneath the Post Office cable bearers in the subway on the Thames Embankment within a short distance of the scene of the fire which occurred last year. Although the damage to the Post Office cables was not so extensive as on the previous occasion, it was sufficiently serious to cause much dislocation of telephone traffic. Twenty large junction and subscribers' cables were destroyed and also a number of smaller cables. The number of working circuits was approximately 3,000.

As soon as the subway could be entered, and the extent of the damage ascertained, the work of restoration was put in hand. By the following day arrangements had been made for the diversion of 1,200 circuits to alternative routes and the remainder of the work was well in hand. The outgoing circuits from Tandem Exchange and other leading exchanges were increased so as to enable an additional load to be carried. By these and other means it was possible to provide a satisfactory service to all exchanges by June 12, and by this date all the subscribers' lines had been restored. The speed with which restoration was effected reflects the greatest credit upon those who organised the work and upon those responsible for the actual execution. The actual cause of the fire has not yet been ascertained.

Explosions. Damage to Water and Gas Mains.

The recent happenings in London lend interest to a statement that under the auspices of the American Bureau of Standards, experiments are in hand to determine the effects of vibration and electrolysis upon ducts and pipes of various materials in different climatic and other conditions. Special attention will be directed to the possible effects of these electrolytic currents upon the materials used for the experiment.

C.T.O. NOTES.

Promotions.

Mr. J. H. Mitchell, Assistant Superintendent to Superintendent (Lower Grade), and Mr. E. J. Samuel, Overseer to Assistant Superintendent. Miss J. E. M. Nash, Assistant Supervisor to Supervisor.

Retirements.

Mr. C. A. Kindon (Superintendent Lower Grade), Mr. A. C. O'Brien (Assistant Superintendent Cable Room), Messrs. R. Comben and A. J. Kings (Overseers) and Miss E. Winsor and Messrs. H. W. Vincent, O. H. Mitchell, C. W. Ellis and A. D. Lavendar (Telegraphists).

Obituary.

We regret to learn of the death of another of our old colleagues in the person of Mr. Charles Fenton, a former Assistant Superintendent at the C.T.O. and Threadneedle Street B.O., which took place at his residence at Shanklin on April 24 last in his 75th year. Entering the old Electric and International Telegraph Company in 1868, the late Mr. Fenton was appointed in 1870 at Southampton, on the transfer of the telegraphs to the State. He was transferred to the C.T.O. in 1874 as a Second Class Telegraphist. After becoming a First Class Telegraphist, he was appointed as an Overseer and Senior Telegraphist in 1886; Second Class Assistant Superintendent in 1894, and a First Class Assistant Superintendent in 1902. He then took up duty at the Threadneedle Street B.O. until he was promoted in 1908 to the Postmastership of Jersey, retiring from that post on reaching the age limit in 1915.

Rambles.

Surrey's beauty appears to retain pride of place for office rambles. The Night Staff and the "F" Division recently tasted the delights of the county, the "Nights" exploring the woods and lanes between Claygate and Oxshott, whilst the "F" Division strollers found the hills and dales around Leatherhead and Mickleham still full of charm.

Sports.

Bowls.—The C.T.O. beat the P.O. Engineers in the Civil Service League game by 68 to 51, lost to the Admiralty 58 to 60, but won the match against the Valuation Department, Inland Revenue, by no fewer than 90 points, the scores being C.T.O. 111, Valuation Department 21.

C.T.O. Sports Meeting.—The "Centels" will hold their 15th Annual Sports Meeting and al-fresco dance on Friday, July 12, at Chiswick. The "Centels" Association invites departments to enter teams of four ladies in a 440 yards relay race, and men in a 440 yards individual handicap. Entries should be sent to Hon. Secretary, Mr. G. W. Ince, "D" Division, C.T.O. The men's entries should be accompanied by a complete A.A.A. form and 1*s.* entrance fee.

The club especially appeals to all connected with the C.T.O. and friends in other offices to note the date and support the meeting. Teas and refreshments will be available, and Leonard Coombs' Bon Accord Orchestra will be in attendance.

Cricket.—Curtis Bennett Shield, Second Round. After a drawn game with the Ministry of Labour on June 10, the "Centels" were beaten on June 17 by four wickets. Scores: First match, "Centels" 243 for 7 (W. T. Cook 118, P. Drummond 40); Ministry of Labour 263 for 8. Second match: "Centels" 168, to which the Ministry of Labour replied with 172 for 6.

The inter-Gallery match between the "Centels" and "Fortels" resulted in a win for the latter. Scores: "Fortels" 182; "Centels" 112.

Farewell Dinner to Messrs. F. W. E. Charrosin and G. J. Smith, of the Cable Room.

Friends of Messrs. F. W. E. Charrosin and G. J. Smith held a most successful function in bidding farewell to their retiring colleagues, who were made the recipients of well-deserved testimonials. The evening was concluded with music.

LONDON TELEPHONE SERVICE NOTES.

Bowls.—L.T.S.

THE Bowls Section continue their victorious career, their record up to and including the match played on the 11th June being played and won five.

The final scores in the last three games are given below :—

May	21st	...	*v.* Cavendish	...	...	...	Won by 89 shots to	38
„	29th	...	*v.* Board of Education	...	...	„	63 „	52
June	11th	...	*v.* Customs & Excise	...	...	„	60 „	59

The game against the Customs and Excise proved to be most exciting. The Customs team is one of the best in the competition, and it was a creditable performance to overcome such a strong combination.

It is a remarkable commentary on the fighting qualities of the L.T.S. team that at every period of the game—until the final wood on the last rink was bowled—the Customs team were leading. Two rinks had completed their games when the third rink had still two ends to bowl. The score at this period was 59—56 in favour of the Customs. A two to the L.T.S. brought the figures to 59—58 and one end to go. The last wood of the game was delivered by the opposing skip with the L.T.S. apparently lying one in, and, luckily for the L.T.S., the final wood was "wrecked" by what was described as the worst wood of the evening.

The suspense was not over until it was finally proved after several measurements had been taken of the contesting woods—during which time the players were looking on with a strained look on their faces and lying about in most undignified positions—that the L.T.S. had secured the match by the sixteenth of an inch. It was a really fine game, with the Customs perhaps a little unfortunate to lose so narrowly.

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THE LAST RINK, WHEN ALL STOPPED BREATHING. WHO HAS WON?
L.T.S. v. Customs and Excise.

In the local tournament, 1st Round, Mr. Barry beat Mr. Hack by five shots. Members are requested to arrange to play off all 1st Round matches by the 25th June, and 2nd Round ties will, if possible, be disposed of by the 17th July, 1929.

The club's remaining league matches are :—

June 20th.—*v.* L.P.S.
July 22nd.—*v.* Science Museum.

* * * *

Contract Branch Notes.

The business done by the Contract Branch during the month of May resulted in a net gain of 4,189 stations as compared with 4,461 last year. This drop is disappointing, especially after the improvement in the April figures had raised our hopes, but the figures for the two months April and May, taken together, are 240 stations more than last year.

Mr. F. Squibb, Contract Officer, Class I in the Western District Office, retired from the Service under the age limit on the 15th ultimo. Mr. Squibb joined the Post Office canvassing staff in November, 1901, when the Post Office London system was in its infancy. A farewell gathering was held on the 26th ultimo, when the staff presented Mr. Squibb with a substantial cheque as a token of their esteem and good wishes for the future.

There were on the 31st May 1,323 kiosks in London—an increase of 109 since the beginning of the year. The number is increasing steadily, in spite of all the difficulties of obtaining suitable sites.

We understand that tin containers containing advertising matter are to be provided in all kiosks and call offices where the consent of the landlord or owner of the site can be obtained.

Our congratulations to Mr. C. N. Benham on his promotion to Contract Officer, Class 1.

* * * *

Contracts Cricket.

During the month of May three matches were played in the league tournament, two against the Accounts Branch, and one against the Traffic Branch. The Accounts Branch won one, and the Traffic Branch won their match, the remaining game being drawn.

Although there are still three matches to be played, it is doubtful whether it will be possible to retain the Shield, and on present indications the Accounts Branch look like recapturing the trophy.

Nevertheless the future, so far as the Contracts Branch is concerned, is particularly bright. Several new men who have only been introduced to the team this year look like developing into good players, and in the case of cricket the period of adolescence is generally longer than in most other games.

Scores in the games were as follows :—

15th May, 1929.	Accounts Branch,		129 for 7 wickets declared. Young 70.
,, ,,	Contract	,,	62 for 7 wickets. Hodgkiss 18 not out.
21st May, 1929.	Traffic	,,	99—Griffiths 5 wickets for 14.
,, ,,	Contract	,,	93
27th May, 1929.	Accounts	,,	98
,, ,,	Contract	,,	71

Post Office Sanatorium.

There was a pleasing little ceremony at the Royal Albion Hotel, Brighton, on Saturday, June 1, when the delegates representing the London Telephone Service at the 11th Conference of the Post Office Sanatorium Society assembled to do honour to Miss M. M. Worth, their constituency secretary.

Mr. E. H. Atkins, in handing to Miss Worth a handsome handbag, stated that his colleagues felt that they must show their great appreciation of the work performed for some years by their dear Secretary. Her work among their colleagues in the London Telephone Service, and also on the Board of Management of the Post Office Sanatorium Society, entailed a great deal of time and attention, and it was only fitting that she should have some tangible sign of their appreciation.

Miss Worth, who was taken completely by surprise, said she was only too pleased to do what she could at any time for her suffering colleagues, and did not regret giving up her spare time in so excellent a cause.

* * * *

L.T.S. Sports Association.

The Annual General Meeting was held in the Refreshment Room, G.P.O. South, on Friday, June 7, at 5.30 p.m.

The Chair was taken by Mr. Hugh Williams, who reported that, owing to the transfer of Mr. Beck to the District Managership of Exeter, the Association were without a Sceretary, and consequently some difficulty had been experienced in presenting an Annual Report. A brief résumé of the activities of the various sections of sport was, however, given, and the result of the year's work was considered gratifying. The Chairman reported that the Tennis Section, in addition to the annual competition for the Agnes Cox Cup, had arranged a "Singles" contest, which was now in full swing, and that Mr. Pink (Assistant Controller) had very generously offered a Cup for the winner. The Association desired to record their gratitude and appreciation of this increased and tangible interest in the L.T.S. sports movement.

It was also reported that it was desirable to form a Hockey Section, and the new Secretary, when appointed, would be requested to get into touch with the various hockey clubs with a view to forming a League next season. In this connexion the Chairman promised that he would endeavour to obtain a trophy for competition if the venture was successful. As the reports of the other sectional sports have appeared in this Journal from time to time, it was not considered necessary to refer in detail to their work.

A financial statement was then presented, and after clearing commitments for the summer sports a balance of £20 4*s.* 7*d.* would be in hand.

The election of officers was proceeded with. Owing to the retirement of the Controller, Mr. Valentine, the Presidency became vacant. The Chairman reported that he had already broached the subject to the new Controller, Mr. Napier, and was now awaiting a reply. This action was approved by the meeting.

It was proposed, seconded, and unanimously agreed that Mr. George Lewis, of the Accounts Branch (A.R.4E) be appointed Hon. General Secretary, and the Chairman was requested to write to the late Secretary, Mr. T. A. Beck, and convey the appreciation of the Association for his services during the past two years.

Mr. Hugh Williams was re-elected Chairman, and was also thanked for his interest in the Association.

A discussion then took place as to the advisability of withdrawing from the Civil Service Sports Association with the object of inviting the existing members to contribute similar sums to the L.T.S. Association, and thus create a financial basis upon which to build up a Sports Ground Fund. The Chairman strongly deprecated such action being taken, and pointed out that the C.S.S.A. were doing their utmost to provide grounds to meet the demands of its shareholders. Chiswick already served its Western members, and now Walthamstow provided accommodation for Eastern players. In due course Northern and Southern areas would be opened up, and thus London would be fairly well provided for in all districts. He further pointed out that a severance from the C.S.S.A. would place a heavy burden upon the L.T.S. Association, and to achieve anything like success an enormous capital would be required, as well as a large income. It was finally decided to refer the matter to the Executive Committee to set up a sub-committee to further discuss the matter and present a report to the next Annual General Meeting, or a special general meeting, if deemed necessary.

A proposal was then made that the Association hold a sports day. It was agreed that such an event would be welcomed, and a sub-committee would be set up to arrange the details.

The meeting then closed with a vote of thanks to the Chairman.

* * * *

Tennis Section.

The first round in the "Agnes Cox" Cup has now been completed, and the following teams are now left to play in the second round :—Hop, Clerkenwell, A.R.2, A.R.5, Trunks R.1, Tandem, A.R.1, A.R.4 (this team has played and won its second round), Fulham, Chiswick, Avenue, Ealing, Kensington, and Central.

In the Singles Competition for the "Pink" Cup, the representatives of the following Exchanges and Sections have qualified for the second round : Maryland (second round already played and won), Tottenham, Grangewood, Clerkenwell, Fulham, A.R.2, Enfield, Western, Victoria, Trunks, A.R.1, Molesey, Central R.1, and Kensington.

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THE

Telegraph and Telephone Journal.

VOL. XV. AUGUST, 1929. No. 173.

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TELEGRAPH AND TELEPHONE MEN AND WOMEN.

LXVII.—MR. HUGH TOWNSHEND.

ONCE upon a time, so the legend goes, the work of the Secretary's Office was to sit still, to receive the reports of experts, and to pass judgment; when they found a decision difficult, whether by reason of indecisiveness or by lack of understanding, there were other experts to be consulted, so that in course of time, by accumulation or contradiction of testimony, every problem might be expected to solve itself. In these days the Secretary's Office plays a less dignified but possibly more useful part; and Townshend as much as any man is typical of the new order of things.

A Principal in the Telephone Branch, he is mainly employed on the trunk-line system and on overseas telephony. His work requires that the demands of a (rightly) exacting public should be satisfied, nay more, anticipated, and that the prestige of the British telephone service should be established and maintained throughout the world. It gives no time nor scope for critical aloofness; it is Townshend's way to be in on a project at the start and to carry it through to the finish. Before a project has even taken shape, he will hammer out the details with the experts, displaying not a little of the "expertise" of each; discussion is the very breath of life to him, and his frankness, his occasional provocativeness, have a way of bringing the best out of everyone with whom he discusses. For this reason he is specially fitted for international negotiations, of which many fall to his lot; he assists Sir Thomas Purves on the International Consultative Committee for Telephones. He is fortunate in having a fluent knowledge of French and German and a quick appreciation of a foreign point of view; and above all he has the faculty of paying full attention to the details of a complicated issue without ever losing sight of the underlying principles.

[*Photograph by Vandyk, 41, Buckingham Palace Rd., S.W.*

Of hobbies in the ordinary sense of the word he has none; he is almost superhumanly indifferent to the lures of the world, the flesh and the devil. But rumour has it that in this month of August he may be found in some obscure village in the south-west, swimming or sailing a boat.

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HOW TO IMPROVE THE TELEGRAPH SERVICE.

VII.—By a Traffic Officer.

[NOTE.—*The Editing Committee accepts no responsibility for the views expressed in this series of articles.*]

FROM time to time over a period of many years, but perhaps more frequently of late, statements have appeared in the press and in service journals suggesting that there is a great deal amiss with the telegraph service; that it is run at a loss; is growing unpopular, with a steadily declining traffic; that it is slow, inaccurate, and inconvenient; and that the public is critical and the staff restless. Such criticisms may not be fully justified at the present time, but probably no one associated with the telegraph service would contend that there is not room for improvement in some directions.

The decline in traffic is a well known fact. It has been attributed partly to trade depression but mainly to the competition of the telephone service, and there is at the moment every indication that the decline will continue. One might draw an analogy between the railways and motor transport competition, and then suggest that an endeavour be made to arrest the decline in, and to attract more, telegraphic traffic by introducing cheap rate facilities, and by advertising the general service widely and persistently.

In order, however, to ensure a fair measure of success one should be reasonably confident that the wares to be advertised are good and relatively cheap.

The present cost of a telegram is out of proportion to the rise in the cost of living since pre-war days, while in many quarters the speed of transmission is alleged to have deteriorated. The writer does not propose to offer any observations on the tariff except to say that, judging from the report of a recent Parliamentary Committee, the possibility of any general reduction in tariff seems out of the question. As regards speed of transmission it might be argued that the speed should be the best one can afford, and as we have been informed on the best authority that a loss of fivepence is incurred on each telegram handled, the logical conclusion would seem to be to abandon the service altogether! A service, however, that in spite of falling traffic still handles about one million telegrams a week must be maintained; and it should be common ground on the part of the public, the Department, and the staff, that what is worth doing is worth doing well. Are we really doing well from a quality of service viewpoint? On the one hand, heavy delays are alleged, while on the other hand the view seems to be that the service is "reasonably good." The writer is not impressed with the tales of the wonderful service given in the "good old days"; his own recollections are of far too many occasions when "abnormal pressure" existed, when extra points were worked, diversions freely resorted to, hundreds of blue slips waited transcription, with heavy delay at concentrators. In some respects, at any rate, there has been an improvement since those days; but a service having an appreciable number of telegrams that are not disposed of in an hour from handing-in time to delivery to the addressee still has very much scope for improvement. It has been stated that the total transit time of the average telegram is about 45 minutes; and to the average business man this must be about as comforting as to be told that the average depth of a pond is 2 feet when someone pushes him in at the 6-foot end! A much better quality of service ought to be given. There are still too many periods of "abnormal pressure" and other features previously mentioned, and an interesting fact is that this state of affairs is more pronounced on main routes—where one would expect the best service, assuming sufficient, expert, and specialised staff, ample circuit capacity, a high standard of apparatus and line stability, and an excellent output. And if difficulty and congestion occur on the main routes certain reactions are manifest on the smaller routes in the same offices.

Soon after the trade and traffic slump early in the post-war period, a fresh basis of staffing was adopted and revisions of establishments were carried out based on the average daily traffic throughout the year. Subsequently the basis was altered to the average daily traffic during the non-season period with a permissible reduction to the extent of the average percentage traffic decrease during the preceding five years. The staffing standards used in these revisions were designed to give a definite standard of service which unfortunately in practice on numerous routes—particularly on main routes—has not been attained, while the operator output appropriate to the standards has not only not been reached but has consistently remained relatively low, even in cases where the conditions would seem to be clear and straightforward.

What are the probable causes and remedies for this state of affairs? The opinion has been freely and generally expressed that instability of machine circuits and apparatus, particularly apparatus, is one of the main causes of the trouble, as it leads to disorganisation and delay; and examination of stability returns certainly indicates some ground for this view. It would appear necessary, therefore, to fix and promulgate better and definite standards of stability for the various types of apparatus, and urgently to create an organisation capable of maintaining such standards. One has an uneasy feeling that machine apparatus has, in some cases, been introduced where the staff, both on the traffic and on the engineering sides, have not had that degree of training and instruction necessary to ensure that there shall be no deterioration in the quality of service either during or subsequent to a change over. Happily, there are signs of a better appreciation of these points and the need for the adequate provision both of reserve machines and spare parts; but it is suggested, in view of the rapid extension of machine working, that in each Superintending Engineer's District there should be a responsible engineer whose prime duty would be the good maintenance of telegraph apparatus.

Inexpert staff in some cases possibly by reason of insufficient training or too small a degree of specialisation undoubtedly contributes to the present position, and it is essential that this handicap be removed. A higher standard of qualification for touch typing should be imposed generally, the existing staff being withdrawn gradually but regularly for further training where, on test, the standard cannot be attained. Concurrently, the existing conditions demand that efforts be made to introduce a real and definite specialisation on machine circuit duties—and on any other duties where such a course would be advantageous—both in regard to the rank and file and the supervising force. This pre-supposes training of the supervising force in machine systems, as distinct from operating, where their knowledge and experience may be somewhat weak, and instruction in the fundamentals of the control and disposal of traffic.

It may be well to recall that the Administration has always contended definitely that the staffing standards are reasonable and that all due allowances have been made for work incidental to operating, and for the other factors that warrant an allowance, while the staff Associations take the opposite view. A deadlock on this subject has continued for some years. Human nature scarcely permits a person to be happy at his work when suffering a grievance, real or imaginary, and while that deadlock continues it is not unreasonable to infer that full co-operation between Administration and staff is wanting in the efforts to maintain and improve the quality of service. What prevents agreement? Surely it should be possible for the two great bodies concerned to come to terms on a question of so vital importance. The writer suggests, therefore, that fresh discussions should take place between the two parties.

Stability of lines generally is not unsatisfactory, but there are cases where it is desirable to reach a better standard on those used for machine working. Our engineering colleagues ought to find means for raising the standard without much difficulty.

Non-standardisation of machine apparatus is also held to be a troublesome feature in regard to stability, but it is now a diminishing quality. With the extension of teleprinter working to circuits

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carrying loads of but 200 telegrams daily, one can visualise the time when circuits will be divided into automatic multiplex, teleprinter, morse, and telephone, if, indeed, the teleprinter does not ultimately oust the first named. Will the retention of morse really be justified? If by mass production teleprinter makers could reduce appreciably the cost of that machine, it would be a good policy to extend the teleprinter field; the balance of the lightly loaded circuit traffic being disposed of by telephone. Alternatively, consideration might be given at once to the question of dealing by telephone with loads below 200 daily by adequate training of the staff and the use of typewriters for reception.

In any case, the further extension of the policy of concentration of traffic by telephone on to given centres that are also "appointed offices," and the through-switching of traffic for direct disposal between post offices in junction areas is strongly advocated, coupled with the use of typewriters for reception at those centres. Incidentally the phonogram service would benefit in speed and output.

Any pronounced general improvement in the overall transit time must involve a speedier delivery service, and it is suggested that the reintroduction of the "docket" or a similar system should be considered so far as the larger towns are concerned. There may, however, be another solution for other places. In a remarkably short time something in the nature of a vast organisation has grown on the roads of this country and possibly it may offer means for improvement in the delivery service. This organisation consists of the motor garages and petrol-filling stations. Many are "open always" and might therefore give a continuous, or at any rate, a very extended service. A large percentage are situated on main streets with ready means for handling message work. It may be convenient although not essential to conduct delivery from Post Offices; but where the load is light a change might be considered on grounds of speed and economy. The suggestion embraces express delivery, but special conditions would need setting up for M.O. work.

As regards changes that would probably be welcome to the public while tending to increase traffic, the encouragement of private wires, particularly teleprinters and telephones, without charge for clerks' services, deposit accounts without a booking fee, waiving of all telephone fees in connexion with A and C phonograms, provision of better writing accommodation at the counters, abolition of the surtax on Sundays and holidays, increase in the number of collecting offices, extension of the hours of acceptance both at night and on Sundays, and delivery at all fair-sized towns, and the provision of seasonal greeting, &c. telegram facilities, all merit consideration, in addition to a wide and persistent publicity scheme, and a bolder and more prominent indication of the location of telegraph offices.

There is a well known slogan "It pays to advertise," and there is much evidence in commercial circles that it does. Assuming that a definite improvement in the quality can be made, is it too much to ask that the telegraph service should have its chance? The very fact of advertising would go a long way to obtain better co-operation and interest of the staff that is so essential, and it would do much to dispel the impression that undoubtedly has prevailed that the decline of telegraph traffic is not a matter of great consequence. Possibly the realisation that definite efforts were being made to encourage traffic would render somewhat more acceptable the changes that have become necessary during recent years. These changes have altered the outlook and prospects of many capable members of the staff even at a relatively early age, and the writer's final word is that no avenues ought to remain unexplored in an effort to open up new outlets for these men and women, for he believes that success in this direction would lead to a very noticeable improvement in the service given by telegraph.

[This concludes the series proper of the articles by contributors invited by the Editing Committee to discuss the question "How to Improve the Telegraph Service." Two supplementary articles contributed spontaneously by an Engineering Officer and a Telephone Contract Officer will be published in succeeding issues.—ED., *T. & T.J.*]

PERSONAL TELEPHONE SERVICE.

THE object of speech is to convey some idea either to a number of persons collectively, as in a public address, or, more commonly, to some given individual.

The value of the telephone lies in the fact that its use makes it unnecessary for the speaker and the hearer to be within those few yards of one another which form the limit of the human voice.

The development of the telephone as a means of addressing a gathering is in its infancy, but its use as an established means of enabling individuals to converse is bounded by one limitation only—ability to secure the attention of the called person at a connected telephone instrument.

The *raison d'etre* of a telephone is to annihilate distance, and its value is proportional to the inconvenience, time, trouble and expense saved by its use. But a perfect telephone service is valueless to a caller who cannot secure speech with the person required, whether that person be a named individual or a member of a specified group of persons.

When the distance separating the calling person from the person required is short the cost and trouble of more than one call to secure the attention of the particular person required is not a serious matter, but as distance increases so the risk of loss and inconvenience through calls ineffective because of the non-availability of that person increases; and over long distances this risk operates in practice as a serious deterrent to the use of the telephone.

This factor has been fully recognised in America, where the distances over which business and social interests spread are so much greater than in this country, and in the first instance the normal tariff for all long-distance services there carried with it the right to name the desired person, and required the payment of the trunk fees only from the moment when the calling and called persons commenced conversation. The transatlantic service also has been worked on this basis from the outset.

Similarly, on the Continent of Europe there has long existed a system which, while not going so far as the American system to ensure the simultaneous attendance of the calling and called persons, gave, for a supplementary charge, a warning in advance to the called person that a call from a given place would shortly be made to him.

The obvious utility of and demand for a service of this type over long distances has naturally led to a consideration of its application both to the internal services in this country and to the Anglo-Continental services and by the time these lines appear the former class of service will be available, while the latter class, as indicated in the Editorial in this number, may be expected shortly.

There can be little doubt that when the full advantages of the new facilities are appreciated by the public they will be extensively employed and that they will not only be used in respect of calls which would have been made in any event, but that they will attract new traffic.

The advantages of the new type of service are by no means restricted to the guarantee that only when the required person is available will the full trunk charge be payable. There are, in fact, other benefits which in some cases may even outweigh in importance this primary advantage, and will certainly often be fully worth in themselves the supplementary charge for the "personal service."

A not uncommon form of disagreement between a subscriber and his telephone administration arises in respect of the chargeable duration of trunk calls when, as is commonly the case, private branch exchanges are involved at one or both ends of the connexion. The actual speakers, perhaps not unnaturally, tend to dispute

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the official timings when they are notified that three minutes have elapsed after only one or two minutes of conversation, forgetting that under the ordinary procedure, when the call is merely booked from and to telephone numbers, i.e., between the private branch exchanges, the chargeable period commences from the time that the calling and called "stations" are placed in communication with one another, that is from the moment when answers have been received from the *premises* of the two subscribers concerned.

In these circumstances, any time taken, after the person answering the telephone has ascertained who is wanted, to secure the attention of the person required, whether by search or by extension of the call to another instrument through a private branch exchange, employs chargeable trunk line time, and it is easy to see that an appreciable chargeable period may thus elapse before effective conversation commences. A similar condition may arise at the calling station if the caller is not immediately available when the call matures.

Under the "personal call" procedure, which has now been instituted on the inland services, the chargeable time on a "personal call" will not commence to run until the calling and called persons (as distinct from their private branch exchange operators) commence conversation.

If the risk of delays in finding the called or calling persons be placed at only one minute, it follows that it will pay to book a "personal call" solely to avoid payment for this period of search in all cases where the "personal" charge is less than 33% of the trunk charge for the call, that is for all calls over about 125 miles.

When a call is made to an hotel or other place where the exact whereabouts of the called person may be difficult to trace, this period of search may greatly exceed one minute and the distance over which a personal call will become economical on this ground alone will be correspondingly reduced. This is especially the case on afternoon and evening calls, when the supplementary "personal charge" is only 6*d*.

As mentioned, the foregoing paragraph applies to the method which will be employed on the inland service. A distinction between the methods of timing "personal" calls on the inland and continental services should perhaps be explained at this point. Certain continental telephone administrations were doubtful whether the telephonist controlling an international call would be able, on account of language difficulties, to determine when the actual calling and called persons commenced conversation, and it will accordingly be found, when the conditions governing the Anglo-Continental "personal call" service are published, that they do not provide for the suspension of the moment of "timing-on" the call until the actual named persons commence to speak. In practice, however, owing to differences in the method of operating the Anglo-Continental and the inland circuits, this apparent disability will be of little importance. On the Anglo-Continental services a system of "advance calling" is in force, by which the calling and called stations receive, in addition to the original notice, a definite notification of the imminent maturity of the call itself some two or three minutes before the through connexion is actually given. This period will usually amply suffice to secure the attention of the required persons at their respective telephones, and, in consequence, the timing of the call from the moment when the two "stations" (i.e., numbers) are connected through to one another, as will be done, will normally be the same thing as timing the call from the moment when the calling and called persons are placed in communication.

In respect of both inland and continental "personal" calls the prior notice that a call is to be expected shortly from a given person or place will in many cases enable valuable time to be saved when conversation commences. The intervening period before the call actually matures may be used by the called person who has received the notification to make himself familiar with the latest phases of the matter which he may know is likely to form the subject of conversation with the calling person. Data may be gathered in readiness and time now wasted while information is sought after the call has commenced may be saved.

Under ordinary conditions a long-distance call may fail in its object to secure conversation with some desired person merely because that person is not at the station called—he may, for example, be visiting another branch of the firm or he may be at home instead of at the office. In such circumstances not only is the full trunk fee wasted, but, what may be far more serious, the call is not effective from the point of view of the caller (for it is necessary to bear in mind that the inconvenience and loss resulting from a call rendered useless because of the non-availability of the called person may be far more than the mere waste of the trunk fee involved).

Under present call conditions the telephone administration undertakes to divert a call booked to a given number to any other telephone (within a very wide area) if the telephone station originally called reports definitely to the exchange that the person required may so be reached, or the calling party may himself ask, when booking his personal call, that a second specified line shall be tried if the person required is not at the first.

When a trunk call has been booked the calling person is normally expected to hold himself in readiness to speak when it matures. Circumstances may, however, arise in the meantime which prevent his continuous attendance at the telephone from which the call was booked. Under ordinary conditions the enforced absence of the calling person may render the call useless when it matures, but under "personal call" conditions the call can be diverted to another telephone to the vicinity of which the calling person may have gone, just as it may be diverted to the called person if necessary at the distant end. In each case all that is necessary is to instruct the local exchange accordingly. Similarly, if the calling person is called away before the call matures it will be suspended on request before it comes through if he will not be available at any telephone until he returns to the original station or reaches another one. No longer, therefore, need a caller feel tied to the vicinity of his telephone until a booked call matures. He may proceed to another branch of his business, or pay a business visit, or go home, or to his club, with the certainty (after notifying his exchange of his intended movements) that if the call matures while he is travelling it will be suspended until he reaches a telephone, to which it will duly follow him.

Yet another advantage will emerge in respect of the overseas personal call service which is to be made available shortly. English subscribers may well hesitate to book a comparatively expensive continental call if they are in doubt as to whether any effective conversation will be possible on account of language difficulties when it matures. Loss in this respect may be guarded against by the simple expedient of booking a "personal" call to "Anyone who can speak English" (or French, or German, &c., in the case of a call booked by a foreign visitor), thereby ensuring that the full trunk charge will not have to be paid uselessly if no such person is available at the distant end, and at the same time ensuring that conversation can commence as soon as the call matures if a person with this qualification is available, and avoiding the waste of line time which would result if such a person had to be found and brought to the telephone after the call had matured.

If these varied and valuable facilities are to be fully effective it is obviously essential that the subscribers concerned shall co-operate with the telephone service to the fullest degree by giving their exchanges the most complete and accurate information available at all times as to the movements of the specified persons, and this point is very carefully stressed in the circulars which are being issued to the public with regard to the service.

When the value of these many advantages of the personal call service, any one of which in certain circumstances may be worth many times the "personal charge," becomes appreciated by the general body of subscribers, it is only to be expected that the number of personal calls will increase until they form a high proportion of the long-distance traffic.

W. C. G.

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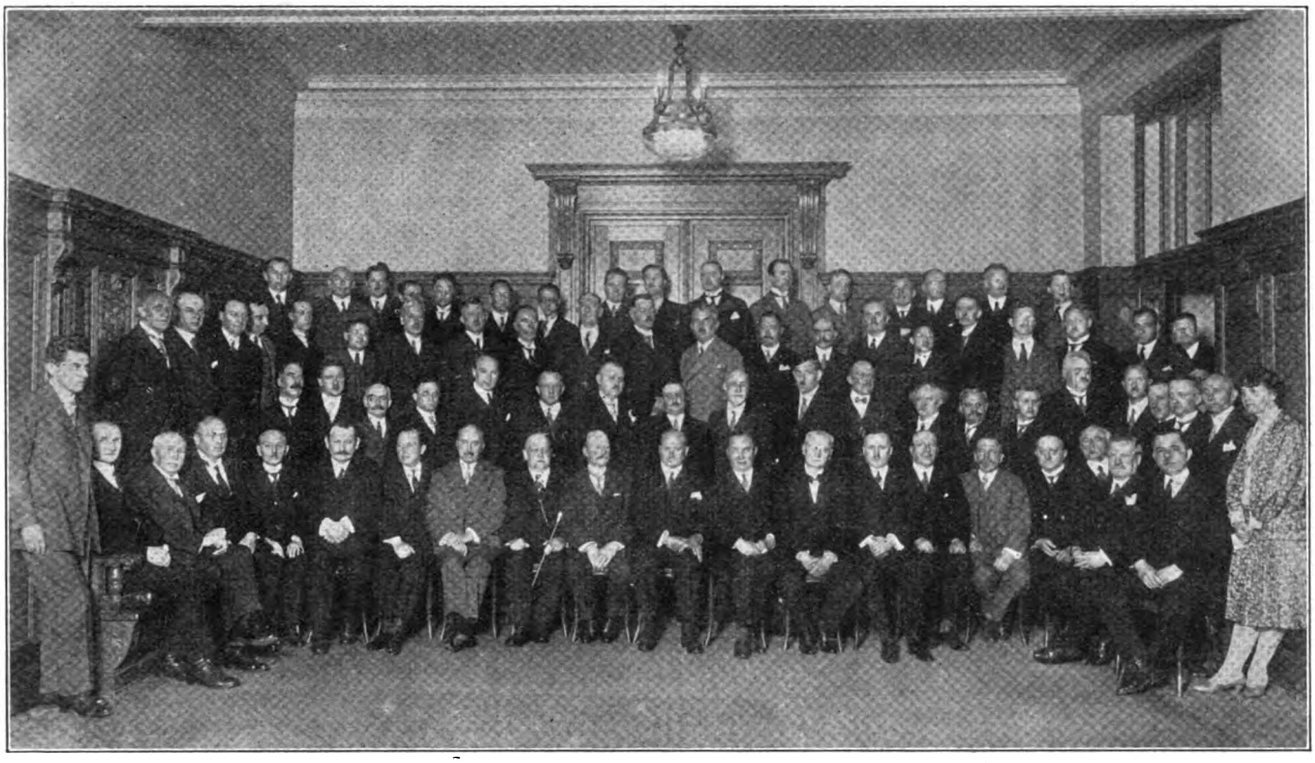

THE C.C.I.T., BERLIN, JUNE, 1929.

THE C.C.I.T., BERLIN, JUNE, 1929.

C.C.I.T. is a much more manageable expression than the long one for which it stands, viz., Comité Consultatif International des Communications Télégraphiques. It is to be noticed that the President of the Committee often has to go through this succession of French polysyllables, but the delegates use, for the sake of brevity, the initial letters at the head of these notes. This is the second meeting of the Committee, and it is the second time that the meeting has been held at Berlin. Delegations come from near and far and from all points of the compass to take part, and the preparatory work for such a conference is enormous.

On each occasion the German administration has arranged for exhibitions and demonstrations of the most up-to-date equipment of all kinds used in large telegraph offices and engineering laboratories, and the inspection of this machinery is a valuable feature of these meetings. No words of praise could be too great for the organisation and the arrangements which are set up in order to ensure smooth working and complete success from the moment the bell of the opening session is rung to the close of the last plenary meeting.

It is perhaps known that for the origins and the *raison d'etre* of the C.C.I.T. we have to look back to the year 1910. By then the traffic to Germany had outgrown the capacity of the existing circuits, and an Anglo-German Telegraph Commission was formed to investigate the technical and working conditions of the cables between England and Germany. A more competent commission could scarcely have been conceived, and its Report, bulging with oscillographs, was a monument of exhaustive research ; but much more important for the future was the personal relationship that was established between the engineers and the executives of the telegraph services of the two countries. Herr Arendt, the leader of the German Delegation, then saw clearly the need of a form of co-operation between the services in studying technical questions and working arrangements concerning international telegraphy, and particularly as regards long-distance telegraphy, and largely as the result of his advocacy the last revision of the International Telegraph Convention and Service Regulations, which took place in Paris in 1925, contains the provisions for the inauguration of these meetings. Herr Arendt was the Chairman of the meeting held in November, 1926 ; and when he stood to address the assembly at this year's meeting the prolonged applause was a demonstration of the honour and affection in which he is held in the telegraph world.

It is natural that in a country which is governed by democratic institutions there should be rather frequent discussions as to the utility of so many conferences, commissions and committees ; and even the Mother of Parliaments is often referred to by irreverent and superior persons as the Talking Shop. It is, of course, difficult to defend so much talk, but the human family is furnished with large endowments to that end, and it is not an extravagant notion that a family with common interests should meet occasionally. By a curious paradox some of the most valuable elements of committee work do not find their way into reports or resolutions ; and in conferences definite interpretations of events and phenomena which are moving and developing and taking shape are more easily formed. It is in conversations of a more or less informal character that one gets to know the differences in the points of view and the practices in the various countries, and the underlying reasons for them. This experience is so common that it is scarcely necessary to labour the point.

There does not seem to be much connexion between the Old Royal Palace of Sans Souci at Potsdam and the C.C.I.T., but there is a point of some interest. From the slope on which it stands there stretches a wide vista, and on the Sunday that we were there in the summer sunshine it was richly lovely. We looked at the name carved in stone over the royal residence, and our modest acquaintance with French phrases told us that there was something wrong, but our guide gave a good explanation that is worth repeating. Frederick the Great, to say the least of it, had a sense of caustic humour, and in any event he could not have been intimately associated with Voltaire, as he was, for nearly forty years without catching some of the penetrating wit of the most potent spirit in the history of modern Europe. The King lived in the right-hand side of the palace, the Souci side, and every morning he called together his staff officers in the rooms on the left-hand side to give them instructions for the day. Frederick was convinced that he had all the cares and worries, and that

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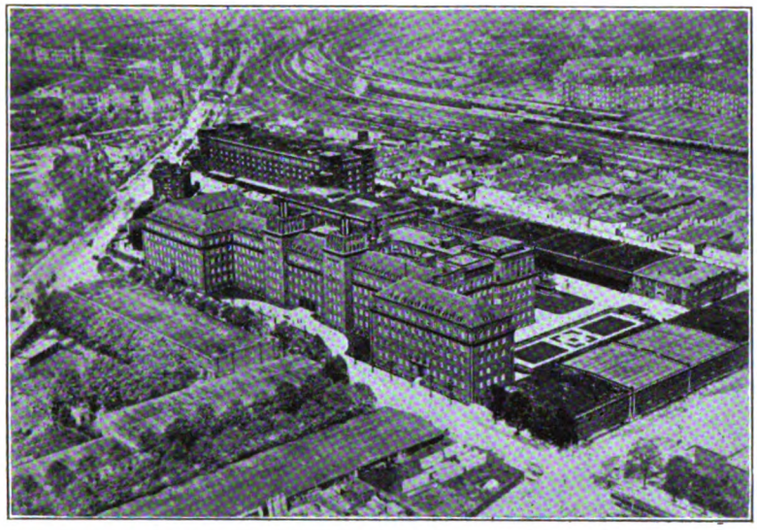

HEADQUARTERS OF TECHNICAL SERVICES OF THE GERMAN POST OFFICE, TEMPELHOF, BERLIN.

his officers did not care a jot or a little bit, and Frederick had a comma placed between the two words over the portals of his palace and it remains to this day.

It is doubtful whether in these days the German-speaking Union would quietly tolerate a foreign name to any of their public buildings; but it is impossible to convey all the associations of *Sans Souci* in a German expression, and so it also remains. Frederick the Great and all the courts and courtiers of Europe had a consuming passion for French poetry, and Frederick retained Voltaire for some enigmatical reasons, but certainly to give polish to his French verses. He paid rather much for the touch of genius, much more than is usually paid, and Paris thought it was a great joke; but the passion had spread over the whole of Europe, and to this day the French language is the language of international conferences, including, of course, the C.C.I.T. The influence of literary salons and the blue stockings has passed away, and one may well enquire what new passion has taken possession of Europe and in what form of art it is expressed and what will come of it, but these questions take us beyond our range.

At the appointed time the delegations arrived at the German Engineers' Institute and assembled in the large Conference Room, where each member's place, delegation by delegation, was furnished with a complete set of the reports and other documents which had been received from time to time in the previous months. Dr. Breisig, the President of the Conference, opened the proceedings with a warm welcome to the delegates, and in the course of his speech spoke of the work of both the Telegraph and the Telephone C.C.I. The following two paragraphs of this speech will be of special interest to the wider audience of this Journal:—

"May I mention a remarkable difference between the respective tasks of the two Committees. I do not allude to the difference in technique and the methods of working, but to the difference which results from the demands of a growing business on the telephone side and from the consequences of diminishing business on the telegraph side.

The Telephone C.C.I. is a witness of a rapid development, which in a period of only five years has created an international service which for extent and volume is almost without precedent. Certainly the facility of entering into direct communication with a correspondent in a very distant country has increased the total number of communications exchanged, but unfortunately, in spite of everything, there has been a reduction in the number of telegrams between the countries because of the possibility of direct speech. If the telegraphs continue in this way, there is a justifiable fear that the relation between income and expenditure, which is already unfavourable in most European countries, will become even more unfavourable in the course of the coming years. In view of the fact that we can never dispense with the telegraphs as a means of public communication, and of the further fact that in the United States of America they have succeeded in finding new methods of working which in connexion with ordinary public traffic give a satisfactory commercial result, telegraph officers must take care to consider the technical and organising measures that will lead to a greater efficiency of the ordinary telegraphs, and, by the example of the United States, find new ways of sharing the future prosperity of long-distance communications."

LARGE COMMITTEE ROOM, INSTITUTE OF GERMAN ENGINEERS, BERLIN.

Following the speech the Committee proceeded to the election of the Chairman, and the name of Dr. Breisig was heard from all quarters of the large hall. It was a unanimous wish from the head and heart of the body of the delegates, and when he took the chair the loud applause rang with sincerity through the building. After that the work commenced.

It would not be easy to describe the spirit that pervades this assembly, which meets with a sense of international solidarity to discuss the items on the programme. Let it not be assumed that in these discussions the difficulty which arose when the language of the human race became confused has been entirely overcome, but here, at any rate, there are no political passions to disturb the will to reach an understanding. One of the distinctive features of these conferences is the fact that they are immeasurably more concerned with the matter of a statement than with the manner

INSTITUTE OF GERMAN ENGINEERS, BERLIN.

in which it is expressed, and no audience could be more sympathetic or helpful. A new fact or a new point of view is taken up with keen attention by the delegates, and the Chairman gives it emphasis, so that, in the issue of an "avis," a proposal may be made which

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takes account of the special circumstances detailed by the delegations concerned. To ignore a vital fact would almost certainly endanger a train of resolutions; and as the propositions of this Committee are intended as modifications of or additions to the International Telegraph Regulations, which have the validity of a legal instrument until the next international revision becomes operative, the C.C.I.T. cannot proceed effectively in this part of its work unless the delegations are in unanimous agreement.

We must yet again give prominence to a French name. Both of the Berlin meetings have done honour to the memory of M. Emile Baudot, in whose life work there is a veritable seed-bed of telegraph invention. At the first meeting the conference received with unanimity and acclamation the suggestion that it should honour this great inventor by defining the speed of transmission of telegraph circuits in terms of the Baud, which, parenthetically, we suppose must be pronounced as Bo in English. At the second meeting the definition of the unit was produced, but it should be understood that it is an engineering expression and not an operating standard. The conference also devoted itself to other matters relating to the Baudot multiplex; but the "avis" respecting these and other items that were on the programme have not yet gone through the official channels of the International Bureau, and it is therefore too early to write about them.

H. B.

TELEGRAPHIC MEMORABILIA.

THERE are not a few matters with which one would wish to place on record in these columns as having considerable interest to the Telegraph craft, and the first of these refers to the strides made with International Telephony.

It is something more than rumour which informs us that there are proposals on foot to lay further telephone cables between this country and the Continent—France and/or Belgium, probably.

One has not had far to seek for confirmation of such extensions, or if not exactly "confirmation," certainly strong circumstantial evidence that would surely give sanction to the increased expenditure involved.

My figures are not exactly official, but it is no secret that the increase in the number of international telephone calls (inward and outward) for Great Britain for the 12 months terminating on Mar. 31 of this year shows an advance of between 30 and 40% on the figures for the corresponding period of 1927-28. To effect this increase the actual number cannot be many short of the high-water mark of seven figures. This is, of course, a mere "flea-bite in the ocean," as Mrs. Malaprop would have said, but the figures are remarkable, and are likely to prove so for some time to come, before their rate of increase steadies down.

It is evident, without becoming an alarmist, that the Anglo-Continental telegraph services, cable and radio alike, will ere long begin to feel the pressure of their new competitor. It will not, however, be forgotten that long-distance telephony to a very considerable extent creates its own traffic, providing as it does facilities of which the telegraphs are incapable so far as the general public is concerned. If, however, the telegraph administrations concerned are able to give practically a no-delay service over the international telegraph circuits, as the gradually improving electrical conditions of these circuits should more and more render possible, and if, in addition, the problem of "quick delivery" is also earnestly tackled there should be no disheartened telegraphists in mourning over the "competition of the 'phones."

That the commercial world has been somewhat disturbed by the new telegraph regulations which come into force on Oct. 1 next was recently made manifest at the World's Trade Congress held in Amsterdam in the early part of last month, under the presidency of M. R. du Moschr. Signor Alberto Pinello, of the International Chamber of Commerce. The Congress represented a number of trade and financial groups covering the more influential business centres of the world.

Speaking at some length on the International Telegraph Service, M. Edouard Dumoulin, after referring to the discussions at previous conferences regarding five-letter code words, explained what would be the position of users of international telegraph systems after the end of September next, and showed the best use that could be made of the new regulations. He had apparently some misgivings of the workability of the new arrangements, as had others of the business delegates, but M. Dumoulin expressed the hope that the various administrations concerned would carefully calculate the use made of the respective categories of code words and the financial result of the new rules. The distinguished speaker also suggested that *all extensive users of the telegraphs should take note of their personal experiences and from time to time report such to their respective national committee.*

Telegraph administrations should therefore be well prepared to hear more of this matter!

The Indian correspondent of the *Electrical Review* states that the latest report of the Indian Posts and Telegraphs Department shows progress in the development of wireless installations. The new receiving and direction-finding station near Malir (Karachi) has been completed and tested under working conditions. In conjunction with the remodelled transmitting station at Karachi, it will be used for civil aviation purposes as well as for communication with ships. For both purposes arrangements have been made for the operation of transmitting sets at Karachi by remote control from Malir. At the inland stations the new continuous-wave transmitting sets at Allahabad, Lahore, Quetta, Peshawar and Nagpore have been completed and similar work at Mhow is in progress. At the Peshawar telegraph office a new receiving installation has been installed and tested, with satisfactory results. A new wireless station has been constructed at Kumaran Island, in the Red Sea, principally for communication with Aden—which comes under the administration of India. The aerial systems at Allahabad, Lahore and Quetta have been completely remodelled to suit new continuous-wave transmitting sets.

Personal.—I have recently had the pleasure and privilege of reading certain of the newest portions of Mr. Herbert's Telegraphy, 1929 edition, which will be ready for publication early in September, in time for the Technical Classes, Session 1929-30. I would strongly advise all intending students who wish to be well up-to-date in the technique of both Multiplex and Stop-Start to first see a copy of the new Herbert before deciding upon a text-book for the coming season.

Promotions.—Though to be mentioned elsewhere, one cannot permit the promotion of Miss J. E. M. Nash from Asst.-Supervisor to Supervisor to pass without at least one word of satisfaction that opportunity has been afforded for recognising efficiency. Not the least of the natural aids to that efficiency in supervision has been a cheerful disposition. To the Misses M. L. Toothill and A. J. McCarthy, on account of similar advances in the service, also felicitations, as also to Mr. J. H. Mitchell, now Supt., Lower Grade, and Mr. E. J. Samuel, now Asst. Supt.

Echoes from the Retired List.—It is with much pleasure that one is able to report steady progress in the condition of Mr. Adam Gordon, now in the closing days of his seventieth year. Those who may recall Mr. H. W. Brookman, who retired early from the C.T.O., in 1902, with the rank of Higher Grade Superintendent, will be more than interested to learn that "Harry" completed his ninetieth year last month. Mr. Brookman's telegraph service dates back to the "old Magnetic" of the early fifties.

Laughter and Tears.—Laughter and tears are meant to turn the wheels of the same machinery of sensibility; one is wind-power and the other water-power; that is all.—*Oliver W. Holmes.*

J. J. T.

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HENDON R.A.F. DISPLAY.

YOU set off originally for Hendon with the firm intention of studying at first hand communication problems relating to air operation, ground organisation, speech amplifying and distribution equipment, and the like. You may perhaps go with the idea of studying other features, technical or not, as the case may be. It is better, however, to go with no such intentions unless you happen to be a hardened visitor to this display and inured to a continuity of thrill and interest sufficient to subdue even the most insistent conscience. In the present instance the fact that this was a first visit is therefore stated and not pleaded.

In service displays on land or water organisation usually reaches a very high standard of efficiency. In this display, where the consequences of a slight weakness at any one of a hundred points would in all probability be serious, the successful presentation of such a varied programme in the time and space available is in itself sufficient tribute to the care and thoroughness bestowed by all concerned.

Months back the passing observer might have noticed the erection of tents in one corner of the aerodrome followed shortly afterwards by signs of occupation. A certain indefinable air of life and interest attaches itself gradually to what was previously rather a desolate waste. Rolls of light fencing appear in a night to be erected later in the form of enclosures; quantities of aeroplane wings are deposited near the site of last year's bombed village, and imagination is rife as to the form which this year's objective will eventually take. The construction of stands commences; signal poles carrying air lines intrude themselves on the landscape together with boards carrying enclosure notices and directions; large white lettering indicates to passing railway travellers the date of the display. And so the long preparation progresses, and the aircraft wings, supported by a wooden framework, gradually assume the outline of a quay, with fort and buildings, and a ship alongside—a somewhat supercilious ship, it may be remarked, with a tip-tilted nose and, no doubt, together with its mobile sisters to appear later, complete with mobile (but nevertheless still) waves, the cause of many facetious remarks being levelled at the designer.

At last the date of the display is at hand. The accommodation and enclosures approach completion. Surrounding fields show signs of impending occupation by invading crowds. The quay, fort, buildings and ship are complete and possess a remarkable air of solid reality, to which, from a distance, the surrounding waves give added effect. The aeroplane park is an orderly mass of many kinds of aircraft uncountable in the network of struts, wings and landing chassis.

The rehearsal is finished—will it keep fine?

It is fine—a glorious day, but hot. So, unfortunately, are some of the refreshments which one hoped would prove otherwise! Half London must be here, judging by the crowd, and have got very hot in coming, whichever the route chosen. Event follows event with accurately-timed precision, and to the continuous roar of powerful engines. Should it be miles per gallon, or gallons per mile with some of these?

The aeroplane park is out of sight owing to the formation of the ground, but an endless stream of aircraft comes up the hill and takes off as the different events fall due. How nice it is in the cooler air stream from the propellers when an aeroplane swings into position. Who wouldn't wish to be aloft on a hot day like this? How easily the twin-engined craft manœuvre on the ground with their port and starboard engines and how hot the port and starboard attendants must be running along with, and swinging into position, the smaller and singled-engined craft. Mr. Henry Ford's ubiquitous first-born is here in yet another application—running round and starting engines.

It is all very wonderful and far too absorbing to permit of any continuous and successive recollections being formed of the various items. A race, then some aerobatics. A "Moth" appears loitering, one might almost say, with intent, &c., it looks so suspiciously casual; or does it remind one more of a policeman standing at a street corner on the look-out for small boys? Another race. An artillery observation event in which the first air fight on the programme draws one's attention from an endeavour to solve the problem of ranges, shell burst, and clock-hour direction. A third race—it is difficult to appreciate these races fully, and far too hot and too much trouble with the attraction of more aerobatics looming ahead on the programme. How attractive the red smoke looks against the sky and how well it indicates the path of the aircraft! Why doesn't the blue machine use blue smoke to match?

Now for the balloon chasing! What tiny balloons—how do they manage to hit them? This chap's better than the one before, he got two that time. That's pretty good, that crossing over of those squadrons; and that snake business; nasty thing to see coming home early in the morning, though! More aerobatics. I say, did you see those big fellows take off just now with the parachutists standing on the wings? They're over there now. The parachutists must be having a cool ride; they had to hold tight when they went up. Here they are now! Look at that man sitting on the other's parachute!

Flying boats! Wonder where they've come from? Pretty well on time anyway, and they must have come from some way off.

Attacking an encampment; air combat; message picking up; flight aerobatics with marvellous upside-down flying and even manœuvring in this position. It is difficult at times to hear the announcements with the noise of the engines, especially while the big sinister-looking night bombers are forming up.

The crazy flying is almost unbelievable, but forms a kind of light relief preceding the last three events of which the finale provides a realistic thrill unsurpassable to the ordinary mind. A fitting conclusion to an unforgettable afternoon despite the efficiency (if not the effectiveness) of the smoke screen.

Afterwards, with the returning recollection of an original intention, comes the realisation of an opportunity for an interesting study missed. But not, perhaps, regretted, in view of the compensations?

THE INAUGURATION OF THE TELEPHONE SERVICE BETWEEN THE ISLE OF MAN AND ENGLAND.

THE inhabitants of the Island have long desired to have telephonic communication with the mainland, and the liveliest interest was manifested in the progress of the engineering work involved. An address on this subject to the Rotary Club was reported verbatim by the local press, and the operations of the cable ship received equally close attention. There was, too, a very generally expressed opinion that the advent of the telephone to the mainland would inaugurate a new era in the history of the Island. Such importance was attached to the event that it was suggested on all hands that the Lieutenant-Governor of the Island should mark the occasion by making the first call to the new Postmaster-General, and that the Mayor of Douglas should similarly exchange greetings with the Chief Magistrates, the Lords Mayor of Manchester and Liverpool, and the Mayor of Bolton. This programme was duly carried out.

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For the first time in its history a telephone was introduced into the Tynwald Court, and at the appointed time on June 29 the Lieutenant-Governor, Sir Claude Hill, suspended the proceedings of the Manx Parliament in order to speak to the Postmaster-General in London from a telephone placed on his desk.

In his message to the Postmaster-General Sir Claude Hill emphasised the advantages which the new service provided in its benefit to commerce and to business men staying in the island. The enterprise of the Post Office had removed an adverse factor militating against the progress and prosperity of the Island. The Postmaster-General, in replying, expressed his pleasure in conveying his greetings by means of the human voice. He said that the Post Office Engineers had, for many years, been working in the midst of great difficulties to accomplish this achievement, and he expressed the hope that the new service would still further increase the prosperity of the Island. He added that the Isle of Man occupied an important position between England and Northern Ireland, and now that matters had reached the stage on which they were congratulating themselves to-day, it was confidently hoped that in the next few weeks it would be possible to extend the new cable service to Belfast. The Postmaster-General then declared the new service open.

The call by the Lieutenant-Governor to the Postmaster-General was immediately followed by calls from the Mayor of Douglas to the Lord Mayor of Liverpool, the Lord Mayor of Manchester, and the Mayor of Bolton. During the day many other calls by the leading newspapers were made to the Mayor of Douglas and to other Civic officials. A noteworthy feature of these calls was the universal satisfaction which users expressed with the volume and clarity of the speech over the new circuits—to quote the *Isle of Man Times*, "The transmission was wonderful."

The Service was opened for Commercial and Private messages at 1.0 p.m., and the volume of traffic was remarkable. During the first day 252 calls were effected between 1.0 p.m. and midnight, and each call had perforce to be limited to 3 minutes. Here it will by no means be out of place to offer a word of praise to the operators for the expeditious manner in which they effected the connexions during a period of remarkable pressure.

The record of the first public call on the new service belongs to Mr. George Brown, the well-known Editor of the *Isle of Man Times*.

It is difficult to convey in mere words the intense satisfaction which the opening of this new telephone service has given to the residents of the Island.

AN AMERICAN TELEGRAPH AND TELEPHONE JOURNAL.

FOR more than a decade the readers of our own professional *Journal* have had the privilege of perusing quotations from newspapers and periodicals of nearly every civilised nation, and among those which have most frequently appeared the *Telegraph and Telephone Age* must surely have a place.

The British *Journal* is in years a mere child of some fourteen summers against the forty-seven years now completing of the *Age*.

Some of our readers are perhaps curious to know how the American publication compares with our own, and without making invidious comparisons, one may at once say frankly that from a British point of view—probably prejudiced—give us the make-up of the London Post-Office production.

Quite naturally the fact that "the regeneration of the Spanish telephone service was accomplished by private enterprise," is duly emphasised, and one could not expect less. Certainly one would hardly expect, at this distant date, to find any reference to instances where the reverse process also gave a regenerative result.

The "Editorial Comments" are much briefer than our own, and at times hardly justify the title just quoted, as the "comments" are frequently simply special items of news. For example, in the mid-June issue now before me, there are four interesting paragraphs, one an appeal for help for the wife of a deceased telegrapher, which takes up half the essential space; about one hundred words describing how the telephone was laid on to President Hoover's Fishing Camp; the third refers to the celebration of the fiftieth anniversary of Edison's incandescent lamp at Atlantic City, where, on May 31, a "Light Festival" was held in honour of the great inventor and also of the seventy-fifth birthday of Atlantic City itself.

Elsewhere in the same issue three columns are also devoted to the same subject which scarcely strikes one as relevant to telegraphy and telephony. However, one's pen does stray out into side-lines at times, and as the Editor's comments write specifically of the "fiftieth anniversary of Edison's lamp," though the "Light Festival" is maintained as a celebration of "the *discovery* of the incandescent electric light by Thomas A Edison," we are sure that our American friends will permit us to read "Swan" for "Edison" so far as being first in the field.

One "comment," that on the British merger, may surprise our readers. The leaderette reads: "The consolidation of the British cable and radio interests is a serious challenge to the radio supremacy of the United States, *and of more importance to our country than oil or merchant marine at the moment.*" It further quotes the words of the President of the Radio Corporation of America, General J. G. Harbord, who is reported to have added: "Great Britain being the great cable-controlling power of our planet."

The *Age* is catholic in its tastes, and in its page of "Mighty Truths of Wisdom from some of our best Philosophers," Sir Wilfred T. Grenfell, G. K. Chesterton, Wanamaker, Steele, Gustav Davidson, Shakespeare, Byron and Einstein are all freely quoted.

In contrast, there is another regular feature, viz., "Springtime Samples of the Gentle Jokesmith's Art of Mirthfulness," which is perhaps not so appealing as probably might prove to be the case in that of our own journal, on its lighter side; and after crossing the Atlantic!

Technical articles appear from time to time, and those at present running on Printing Telegraphs are excellently illustrated with some of the clearest diagrams it has been my joy to follow, but so far as I can gather—this for the solace and support of our own journal's Committee—nothing has yet appeared to equal those on the Automatic System in our columns.

With true business alertness every slightest item regarding telegraphs or telephones is recorded, and perhaps even at this late hour it might prove useful to mention the "Vacation" or "Holiday" telegraph services at "road garages," "filling stations," "air ports" and "refreshment stalls" on all main roads, where facilities are afforded for wiring home one's automobile progress morning, noon and night with such standard phrases as "old bus did 44 on toughest hills," "500 miles and not a flat," &c., &c.

The *Age* is American in the best sense of the word, as we trust that our *Journal* appears as British to the eyes of our cousins in the West.

J. J. T.

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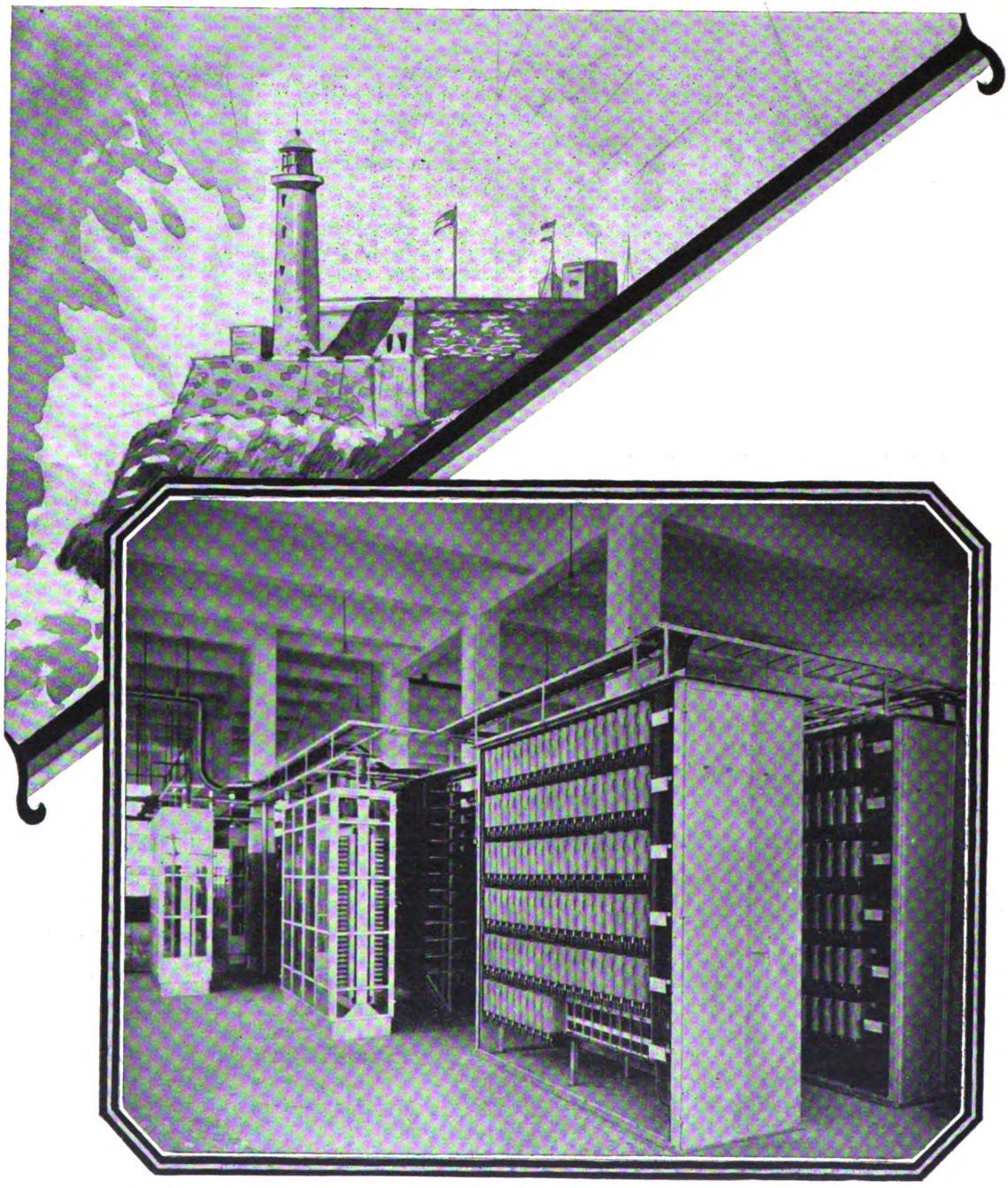

This view shows some of the Strowger Automatic telephone equipment in the Principe Office switchroom in Havana. Principe Office is one of the eight large Strowger Automatic offices now in operation in the Havana area.

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For Canada
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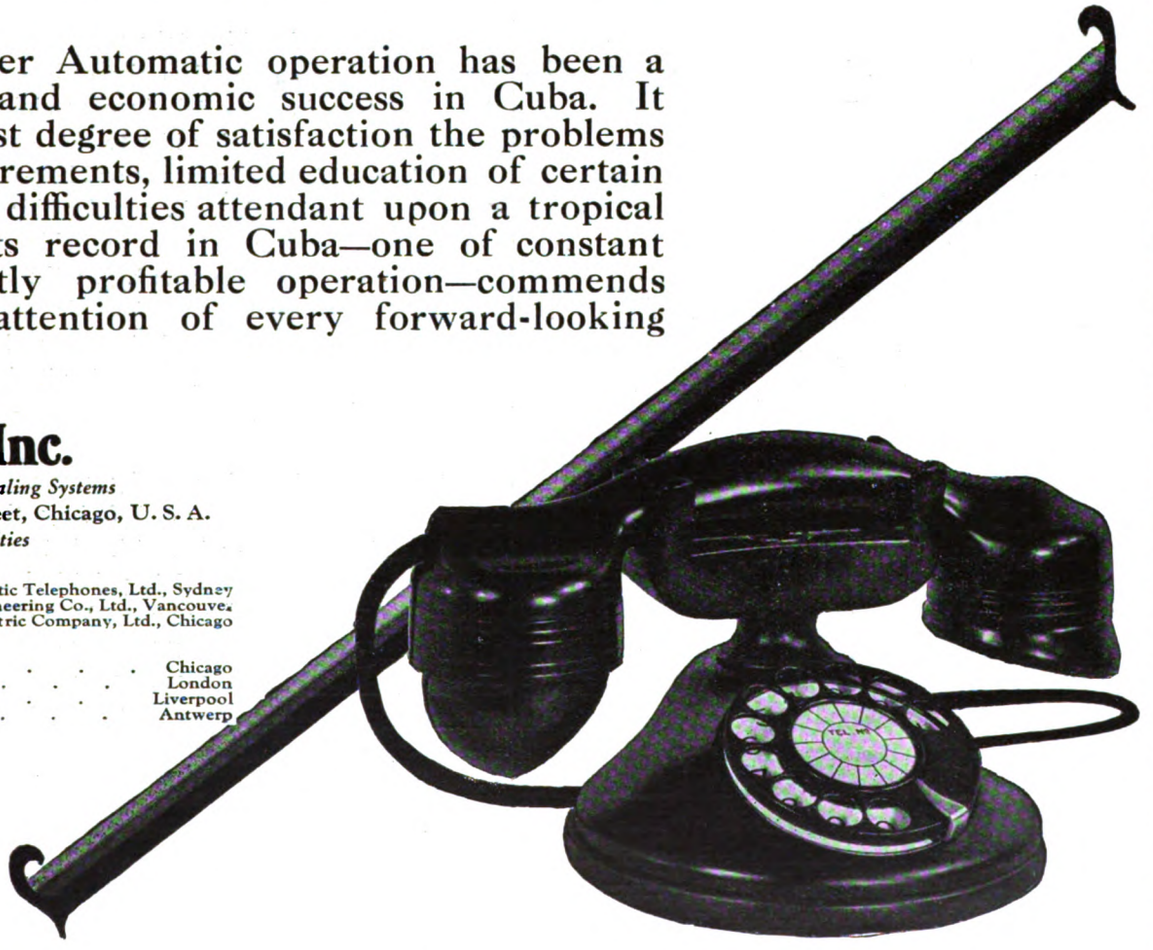
Record of Successful peration in Cuba

NTEEN years ago the first Strowger Automatic hone was installed in Havana, Cuba. To-day there over 45,000 Strowger Automatic telephones in use na alone, and over 10,000 more stations all render- same modern telephone service in seven other the island.

e first, Strowger Automatic operation has been a ced technical and economic success in Cuba. It with the highest degree of satisfaction the problems language requirements, limited education of certain e users and the difficulties attendant upon a tropical id climate. Its record in Cuba—one of constant and consistently profitable operation—commends the serious attention of every forward-looking e executive.



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The
Telegraph and Telephone Journal.

PUBLISHED MONTHLY IN THE INTERESTS OF THE TELEGRAPH AND TELEPHONE SERVICE, UNDER THE PATRONAGE OF THE POSTMASTER-GENERAL.

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NOTICES.

As the object of the JOURNAL *is the interchange of information on all subjects affecting the Telegraph and Telephone Service, the Managing Editor will be glad to consider contributions, and all communications together with photographs, diagrams, or other illustrations, should be addressed to him at the G.P.O. North, London, E.C.*1. *The Managing Editor will not be responsible for any manuscripts which he finds himself unable to use, but he will take the utmost care to return such manuscripts as promptly as possible. Photographs illustrating accepted articles will be returned if desired.*

VOL. XV. AUGUST, 1929. No. 173.

TALKING TO PEOPLE ABROAD—AND AT HOME.

IN our issue of November last year we devoted some space to the question of a "Personal Call" service. The introduction of this additional facility on the longer telephone routes of Europe has for some time been a burning question; and we mentioned last winter our hope that the existing efficient consultative machinery through the medium of the "C.C.I." would enable the obstacles standing in the way to be successfully surmounted.

This hope has now been realised. The whole matter was thoroughly thrashed out by a committee of "C.C.I." rapporteurs who met at Copenhagen in April last and who succeeded in overcoming the difficulties inherent in framing satisfactory operating rules for the working of a "Personal Call" service over the complex network of telephone routes connecting the polyglot and diverse national systems of Europe. The rapporteurs' proposals were discussed at the annual full meeting of the C.C.I. held at Berlin in June and were adopted, in the usual form of an "avis," issued by the "C.C.I." to all the countries represented on it, recommending them to introduce the "personal call" in their international services with effect from Oct. 1, 1929. (Incidentally, this meeting was of special interest in that for the first time some, though not yet all, of the telephone administrations of North America were represented at it by delegates with full "C.C.I." membership and rights.)

The "C.C.I." is, of course, a purely advisory body, and its recommendations do not take effect unless and until they are formally adopted by the telephone administrations of the countries concerned; but we understand that most of the European countries have already notified their intention of taking the advice of the "C.C.I." in this matter, so that the general introduction of the "personal call" into Europe, with all its essential advantages for the telephone-using public, will within a few weeks' time be an accomplished fact.

We venture to congratulate the "C.C.I." on a characteristic piece of good work; and at the same time to assure those administrations which have, in the interests of efficiency, faced the trouble incidental to modifying their operating procedure on a large scale and in important particulars, of our conviction that their decision will be highly appreciated by the rapidly growing section of the European community which uses the international telephone service.

We may remind our readers that the object of the "personal call" is to meet the growing demand by users of the telephone service, when they make an expensive long-distance call, for help in two ways; first, they ask for an insurance, in return for a reasonable premium in the form of a supplementary "personal charge," against the risk of the person they want to talk to not being at his telephone when the call goes through; secondly, they want help from the telephone administrations in finding the person wanted and getting him to the telephone to receive their call. The need for this insurance and help is, of course, the greater the more expensive the call, and for this reason the "personal call" service was made fully available over the transatlantic telephone route from the outset. In the European international services the need of the public in both respects will be met when the new "C.C.I." recommendations come into force in October; and the question has arisen of meeting it also on the inland trunk routes of this country.

As our British readers are by now aware, it was decided to introduce the "personal call" facility throughout the British inland trunk and toll service, with effect from Aug. 1; and when this number of the *Journal* is published the service will be in operation. It has been found possible to offer the "personal call" between any two places in this country (however distant) in the afternoon (after 2 p.m.) and throughout the evening and night hours, when the lines are, generally speaking, less heavily loaded than in the morning, at the low additional charge of 6*d*. During the morning hours (7 a.m. to 2 p.m.) a somewhat higher "personal charge," varying according to distance, is payable on inland personal calls. The possibility of ringing up a business associate or personal friend anywhere in the country at any time in the afternoon or evening with the certainty, not only that he will be found and brought to the telephone if possible, but that if he cannot be found no liability will have been incurred beyond the almost nominal "personal charge" of 6*d*., should appeal to both business men and residential subscribers.

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A GERMAN VIEW OF AMERICAN TRUNK RATES.

THE May issue of *Europäischer Fernsprechdienst* contains a very well informed article comparing the rates for inland trunk telephone service in the United States and in Germany. The writer certainly says: "the trunk service offered by the American Telephone and Telegraph Company is as a rule to be characterised shortly by two words: Good and dear," but he is fully alive to the fact that the two services are not comparable and that you cannot effectively compare rates in two countries simply by converting the charges in one country into the currency of the other, and then, without taking the difference of purchasing power into consideration, proceeding to draw false conclusions. He admits that it might be claimed that in order to obtain as rapid trunk communication in Europe as is normally afforded in America, it would be necessary for a subscriber to book his call as "urgent," and to pay those supplementary "urgent" charges to which many European administrations still cling, and which would bring the cost to the subscriber to a figure in excess of the American charge.

With the conclusions drawn by the writer in his final paragraphs, however, we are inclined to join issue. He says: "If there actually existed an economic requirement for trunk telephone calls (in Germany) to be completed immediately after booking as in America —a condition which is certainly worth striving after, if the costs in connexion therewith be kept within tolerable limits—then much greater use would be made of the 'urgent' call than actually happens." He then gives a table showing that in five years the percentage of "urgent" calls in Germany has fallen from 8.7 to 2.2 in the case of inland calls, and from 23.3 to 4.7% in the case of foreign calls.

But it is surely one thing to fix fairly high trunk rates (with no alternative lower ones) and offer the subscriber a very high-grade and almost instantaneous service in exchange for them, and quite another thing to offer the subscriber a *fairly* rapid trunk service at low rates, and then ask him to pay treble charges if he wants a *really* rapid call. He is obviously not going to pay the threefold charge unless his need is very pressing. It is a well-known fact that the great improvement in the European trunk services, which has been going on continuously during recent years, has largely restricted the scope of the "urgent" service, and is the natural and explicable cause of the steady decline in its use. But that does not, to our mind, prove that there exists no demand in Germany for rapid trunk service. It may prove that the average subscriber prefers to pay the normal rate for a trunk call which is subject to 20 or 30 minutes delay rather than pay treble that rate for an instantaneous call; but it throws little light on the question whether he might not prefer to pay a higher ordinary rate for a trunk service normally as rapid and reliable as that given in America. If the proposal to reduce the international continental "urgent" rate from thrice to twice the ordinary rate, which is to be discussed by the C.C.I. next year, is adopted, experience of the use of an urgent service at the lower charge may throw some light on the real issue, which is admittedly a difficult one.

HIC ET UBIQUE.

MR. S. P. VIANT, J.P., M.P. for West Willesden, has been appointed Assistant Postmaster-General.

We heartily congratulate Mr. M. C. Pink on his appointment to the post of Deputy Controller, London Telephone Service, and Mr. H. Dive to that of Assistant Controller. We also congratulate Mr. G. T. Archibald on his promotion to the Assistant Controllership of the C.T.O., and Mr. F. Riley on his appointment as Inspector of Traffic, Secretary's Office. All these officers are well known to our readers as fairly regular contributors to the *Journal*.

The Geschäftsbericht for 1928 of the Austrian Postal and Telegraph Administration shows a remarkable development of the Austrian telephone system during that year. The total number of telephone stations has increased from 165,613 to 209,470, whilst in Vienna there is an increase from 105,420 to 140,759. This raises Vienna from the 30th to the 21st place in the list of cities with over 100,000 telephones.

Another continent is now in telephonic communication with Great Britain. Telephone service was opened between London and Buenos Aires on July 22. The hours of service vary according to the season, but at the outset are restricted to the period from 5.30 p.m. to 9 p.m. For the present, subscribers in Buenos Aires have to be called by the Argentine officials to a special public call office in order to receive calls from this country, and it is necessary, therefore, for subscribers in this country, when booking a call to Buenos Aires, to give the usual postal address of the person required, in addition to his name and telephone number.

The charge for a call to Buenos Aires will be £6 9*s*. for the first three minutes and £2 3*s*. for each minute or portion of a minute thereafter.

It is now possible to give data of the telephone development of the 5 largest telephone using countries at the end of 1928. The figures are as follows:—

United States	...	19,341,000
Germany	...	2,950,430
Great Britain	...	1,759,686
Canada ...	...	1,341,219
France ...	...	965,519

A correspondent sent us the following cutting which he entitles "A match for the telephone":—

It is reported that the Swedish American Match Trust, which recently obtained a match monopoly in Jugo-Slavia by making a loan to the Government of 30,000,000 dollars, has now offered an additional loan for an exclusive contract to rehabilitate the country's telephone and telegraph systems. If the offer is accepted, Jugo-Slavia will join the growing list of European countries that have entrusted their State telephone and telegraph services to private, or semi-private, bodies to be run on business lines, with a responsibility to the Government to provide an efficient and ample service.

The growing list—a very slowly growing list, we may remark—is confined to countries which were, telephonically speaking, extremely backward. Even in one of these, Greece, the transfer, according to our latest information, hangs fire.

We have received the annual report of the Post and Telegraphs Department of the Federated Malay States. We find that here, as in Europe, there is a decrease in telegraph traffic (10.2% for the year), whilst telephone traffic increased by 5.3%. The number of subscribers' lines is 4,534, with 2,177 extensions, &c., a total of 6,711 stations if we include some bell and alarm circuits not shown separately.

A gentleman writes to the *Evening Standard* saying "it would be interesting if an actuary or accountant could arrive at the number of wasted hours a day that are caused by telephone delays, wrong numbers, &c." But would it? For what could it be worth, no matter how many actuarial titles, honours and degrees

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soever the computed might boast. Interesting also would be computations and conjectures as to the loss of time due to traffic blocks, train delays, heat waves, cold waves, permanent waves, brain waves, and other undulatory distractions. But more interesting still would be the estimates of the immensities of time saved by trains, motor vehicles, telephones, &c., despite inherent and human drawbacks.

The silly season has provided some paragraphs about Mr. Zzyz of New York. A Mr. Zzyn it appears recently enjoyed the enviable distinction of being the last entry in the New York telephone directory. This advertising advantage was snatched from him by Mr. Zzyk, who changed his name by deed poll to Zzyx in order to get behind him. The story goes that Zzyx has been deprived of pride of (last) place by Zzyz. This the *Daily Herald* rashly describes as an unbeatable name. But in 1930 the Z Z Z Association may come along, to be beaten in 1931 by the Z Z Z Company, and in 1932 by the Z Z Z Corporation. 1933 a firm with four capital Z's may appear and the game would then begin again *da capo*.

The University of London has, at the instance of the Institute of Public Administration, established a Diploma in that subject. The first examination was held in July, and amongst the five successful competitors were two Civil Servants, one of whom is Mr. J. T. E. A. Waddell, B.A., a Clerical Officer in the London Telephone Service and an Associate of the Institute of Public Administration.

We congratulate Mr. Waddell very heartily upon the distinction he has won.

We regret that owing to pressure on our space several interesting articles are held over, and some personal paragraphs.

PROGRESS OF THE TELEPHONE SYSTEM.

THE total number of telephone stations working at May 31, 1929, was 1,775,870, representing an increase of 13,246 on the total at the end of the previous month.

The growth for the month is summarised below :—

	London.	*Provinces.*
Telephone Stations—		
Total at May 31	634,479	1,141,391
Net increase for month	3,998	9,248
Residence Rate Subscribers—		
Total	152,847	240,449
Net increase	1,298	2,214
Call Office Stations (including Kiosks)—		
Total	5,626	20,595
Net increase	39	242
Kiosks—		
Total	1,323	5,233
Net increase	36	135
Rural Party Line Stations—		
Total	—	10,523
Net increase	—	81
Rural Railway Stations connected with Exchange System—		
Total	17	1,134
Net increase	—	23

Further progress was made during the month of June with the development of the local exchange system. New exchanges opened include the following :—

PROVINCES—Ashford (Kent) ; Berkhamsted.
Aughnacloy, Ampleforth, Barrhill, Crucorney, Dunsop Bridge, Ellastone, Offton, Pipegate (rural automatics) ;

and among the more important exchanges extended were :—

PROVINCES—Exeter (automatic), Failsworth, Horsforth.

During the month the following additions to the main underground system were completed and brought into use :—

Blackpool—Port Erin—Douglas (I. of Man) cable.

while 70 new overhead trunk circuits were completed, and 81 additional circuits were provided by means of spare wires in underground cables.

THE TELEGRAPH SERVICE IN 1950.

BY JAMES J. TYRRELL.

(*Continued from p.* 206.)

We can admit frankly that, for very short distances, the telephone will eventually oust the telegraphs. Road and air transport will also be competitors, as we have seen, but the Inland Telegraphs of this country will always be an essential part of the long-distance telegraphs which have their termini here.

It must not be forgotten that the Inland Telegraph Service is the telegraph distributing organisation for the British Isles. Upon this organisation every submarine telegraph cable system, and every wireless communication with Europe, Asia, Africa, America, and Australasia, as well as every ship-to-shore system, depends for the primary collection of this traffic and its ultimate delivery in these islands.

It is an indispensable service for these purposes alone, and the question of whether the Government receives an adequate amount in terminal charges for the services rendered may possibly be one which will one day receive examination. Yet, however much this traffic may vary from time to time, it will demand from our own Administration nothing less than an intensively accelerated delivery. It this be not forthcoming, then there will be justifiable cries from the Press and public that the Post Office is apparently not co-operating in making the Empire services a success, possibly a clamour for private enterprise.

But no matter who controls in the future, State or corporation, the telegraphs, to hold their own, will be compelled to accelerate, and of this I am also certain, that whether delay occurs to urgent, ordinary, deferred or even week-end traffic, the pressure for less and less transit time will continue increasingly.

Therefore, I repeat, whoever controls in the near future will be compelled to make radical changes amounting almost to a revolution in the industry, if public confidence is to prove wholehearted.

Reorganisation will mean money, and certainly not less than a million or two must be spent in reorganising, not so much the staff as the machinery.

Cheaper beam and cable rates will add materially to the traffic passing over the inland lines. Private enterprise and its sponsors have promised better results than, they say, a State service can give, and from their own point of view they will be fully justified in throwing the onus of every minute of delay possible upon the Government handling. The successes of the new private interests will have a good Press ; any failure on the part of the State service will also have Press notice ! It is also not difficult to forecast an increase in correspondence, with its concomitant expenditure at Headquarters and elsewhere. One cannot sufficiently emphasise, too, the great need in the coming years for the highest manipulative efficiency plus a zero fault-standard for apparatus. Any hope that the coming years are likely to yield cheaper labour, either in the instrument room or workshop, may be dismissed. You will need your best everywhere, and it must be paid for.

The next 20 years will see the continued and extending use of typewriter keyboard telegraph apparatus on all, if not nearly all, circuits, whether they be simplex, duplex, or multiplex or multiplex-duplex, wire or wireless.

By 1950 an international keyboard lay-out may have been agreed upon as one was tentatively settled in 1926 at Berlin.

The problem of speedy delivery of telegrams will be further accentuated in the next few years, by the trend of business to come south and to surround the metropolis in ever-extending circles. The solution of the problem in crowded areas will, however, not be found in hand-delivery. It may not yet be admitted, but it ultimately will be agreed, that there is a better means than the "walks" system. It will also be further agreed that any attempt to speed-up the pace of boy messengers through the ever-increasing dangers of modern street traffic would be highly undesirable, if not reprehensible.

The delivery difficulty will be largely met by its mechanisation, and that by the aid of the telephone circuits. This will be done by means of typewriter keyboard telegraph circuits superimposed upon the addressees' telephone lines as a special fitment. The fitment will be of a pattern approved by the Government engineers, purchasable from private manufacturers or procurable by hire from the Administration itself.

In the next 10 or 15 years every business house, bank, factory, office, large or small, will have the option of obtaining this supplementary apparatus, or, alternatively, an automatic teledictaphone. Facilities will also be increased for direct private inter-office communications.

With the increase in the number of telephone users the problem of "lightning delivery" will thus become less acute. Hand-delivery will only be resorted to in the case of the diminishing number of addressees "not on 'phone," and where practicable, as in rural districts, delivery will be effected by means of motor-cycles, &c.

Thus, by one system or the other, telegrams would be available for the addressee whether he were in actual attendance at the moment or not, and at any time of the day or night, as such automatic apparatus envisaged would

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produce a printed copy on the addressees' receiver whether he were in attendance or not.

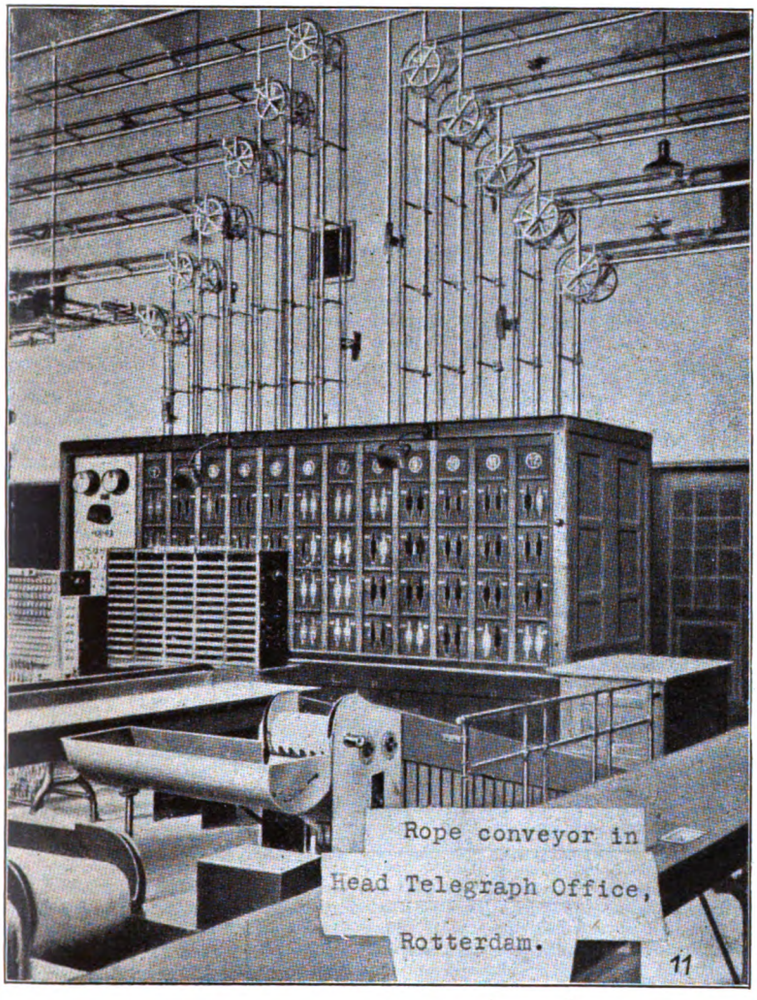
The cost of such apparatus will not be heavy, as mass-production methods will be adopted in their manufacture.

The provision of these facilities will be available for private residences and for the termini of Branch Exchanges.

All post offices now using the telephone for the transmission of telegrams will then also be provided with similar superimposed telegraph apparatus, the better to preserve the secrecy of a telegram, which is now not infrequently dictated over the telephone in the hearing of the public.

The posting of a *copy* of any telegram thus dealt with, or simply telephoned to a subscriber, will no longer be considered necessary in an efficient service. This somewhat superfluous process should not outlive the next decade.

The telegraph offices of 1950 will differ considerably from those of the present day, both in appearance and organisation, especially the larger offices.



As regards the latter, with fully mechanised services, the personnel of the Engineer-in-Chief's department will loom more largely in its every-day work and duties concerning the telegraphs.

As I have already said, we may expect to see type-printing telegraph apparatus equipped with typewriter keyboards on all circuits, main or local, the main or trunk circuits being multi-channelled. Each group of the latter type will be under the charge of a qualified engineer of the Engineer-in-Chief's Department. He will, of course, have no control over the traffic.

Larger groups of the simpler circuits will be under the technical charge of an officer of similar or identical rank, according to the size of the office, traffic dealt with, &c.

These officers of the Engineer-in-Chief's Department will have placed under their immediate charge the necessary staff of fully qualified mechanics, who will bear the more definite title of "mechanic," instead of the wider appellation of to-day. A liberal supply of spare apparatus in certified running order will also be readily available, and in the larger offices in the case of multiplex sets, one or two will be constantly maintained in actual running, so that complete change-overs may be made in the event of an awkward fault or complete breakdown.

The duties of these officers of the Engineer-in-Chief will include the selection of the most suitable conductors.

The necessary supervision of the traffic itself will most naturally be provided by the commercial side and its supervising staff. The dirigeur, as

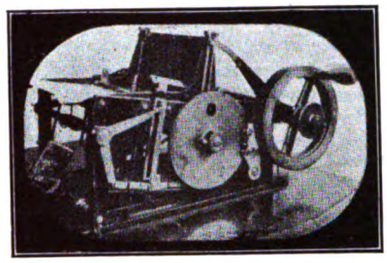


FIG. 10.—TELEGRAM FOLDING MACHINE AS USED IN NEW ZEALAND.

at present understood, will cease to exist, but recruitment for the engineering posts will be open to a stated percentage of technically qualified telegraphists, after a thorough examination, the standard of which would be fixed by the Engineer-in-Chief, plus a certified first-class manipulative knowledge.

The presence in a telegraph office of an active and fully responsible representative of the Engineer-in-Chief will be found to secure not only the efficiency of the telegraph apparatus, but the efficiency of the circuits over which they are to work. This will naturally give to the latter department fuller opportunities for observing the day-to-day difficulties, and for scheduling and subsequently analysing them. It will, in effect, give the engineering department a fairer chance of meeting the criticisms and complaints which, it is feared, at present arrive too late for successful examination and through a third party.

Now, apart from these considerations so far as they fit the present circumstances of the Inland Service, the scientific developments for "making the most of the Line," as Dr. Frank Jewett terms the new systems, the equipment of telegraph offices by the use of voice-frequency, carrier-current, polar-duplex methods, &c., all involving the use of the same circuit for simultaneous working of telegraph and telephone, and the use of type-printing forms of telegraph apparatus, MUST bring into prominence the necessity for actual engineering responsibility for the good working of both apparatus and circuits, whether the latter be physical or phantom.

In one word, specialisation of function in the telegraphs will have fully arrived. The advantages of such specialisation for the telegraphs, a specialisation already long enjoyed by the telephones, will be found especially helpful in cases, for example, where alleged detrimental effects are felt upon *telephone* circuits by certain voltages used on *telegraph* circuits working along the same route, or vice versa, where it is suggested that a *telegraph* circuit is working indifferently due to certain technical restrictions imposed upon it on account of indifferent or disturbed *telephone* audition.

With the new arrangement, such matters become purely domestic to the engineering side, to be settled satisfactorily by that department within its own domain.

The simple situation will then be as follows: the engineers provide, maintain and guarantee both line and apparatus in first-class working order.

The equally clearly defined duty of the manipulative side will be to dispose of the traffic expeditiously.

The possibilities of the newer telegraph systems of obtaining the maximum number of traffic channels from one, two or more physical lines is possibly not yet realised in this country by everyone in the service. One understands the difficulties of harried supervising officers during the transition period of changing from one system to another, but when one reads in a contemporary :—"Concurrently with the changes in *apparatus*, the Engineering Department is busily engaged in adding still further to the task of maintaining efficient communications by substituting high resistance screened telephone conductors with a drastic power limitation, the displaced telegraph lines being surrendered to the telephones," one can only say that the statement is misleading, as these systems are well tried and proven, and their ultimate aim is economy of lines, and the reduction of expense due to new construction. Further, the systems have also yet another possibility, that of the extended use of the telegraphs between large offices, works, depots, &c.—another financial advantage to the Inland Telegraphs.

The possibilities of the future which I have foreshadowed, with engineers in charge, will relieve the traffic side of much of the worry and responsibility on the technical side of which complaint is made. The traffic side will only be answerable for that portion of any adverse criticism which may be due to the failure to produce an A1 output from an A1 circuit.

It must be borne in mind that these modern superimposing systems are far and away superior to the methods available, let us say, in the early days of the Anglo-Continental telephone circuits, when, by means of the Van Rysselberg system, telegraph circuits were superimposed upon the London-

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Paris and London-Brussels telephones, with no small success, on the whole, although I am afraid the telephone had the worst of the bargain, at times.

Those were the days prior to the advent of valves and filters.

Possibilities of Carrier Current Systems.

The carrier offers :—

(1) Three extra telephone channels on one pair of lines.
(2) Ten extra duplex telegraph channels on one pair of lines.
(3) Ten to twelve two-way telegraph channels on a 4-wire telephone cable circuit, or
(4) Five to six two-way telegraph channels on a 2-wire telephone cable circuit.

THE ADVANTAGES.

(*a*) Increased circuit facilities that are in every way equal to or an improvement upon those existing by means of long distance lines.
(*b*) Secrecy in transmission.
(*c*) Reduced maintenance costs per circuit mile.
(*d*) Absolute reliability.
(*e*) Carrier can connect towns a great distance apart by bridging together, for carrier purposes, any intermediate lines without interfering with existing facilities.

The possibilities noted above refer particularly to overhead lines, but superposition is quite practicable for cables, telephone, telegraph or lighting.

While on this interesting subject one may, perhaps, express the hope that future Chancellors of the Exchequer will be more liberally disposed towards research work in connexion with Post Office activities. When one has seen the facilities elsewhere for this, the most essential work of a department whose motto should always be "excelsior," one cannot but greatly admire the good work done in this country on a parsimonious expenditure, while deeply grieving at what one dares to hope will, at no very distant date be ameliorated, even if the reproach be not wholly removed.

There are other developments of telegraphy which will create their own particular market, picture telegraphy, for example. This alone, however, is not going to revivify the Inland Telegraphs of this country, though, naturally, it will not harm it.

Educationalists and business men are inclined to the conviction that the typewriter has spoilt the art of handwriting. Certainly, my personal experience of the public who do *not* use typewriters is along the line that such would rather leave the deciphering of their own caligraphy to the experienced telegraphist at the sending end than use a facsimile system which would all too faithfully reproduce the writer's eccentricities, and annoy a correspondent at the other !

Facsimile telegraphy is, however, still advancing, and certain experiments quite recently carried out are said to have decreased the transmission of an entire picture to one minute.

There is television, too, which is fitting itself into broadcasting, and could, of course, be associated with telegraphy and/or telephony.

Opinion, however, seems divided as to whether the sight of one's correspondent at the other end of the circuit would *always* tend to a better understanding !

The huge developments of the next few years under the aegis of the Electricity Board will facilitate the use of quite a number of labour-saving and comfort-giving devices in connexion with Post Office activities in general and telegraphy in particular. With cheap light and power at the door of every post office and telephone exchange, improved cleansing, lighting and heating will no longer be difficult or expensive.

The heavy swing doors of public offices will then open more easily at the pressure of a small electric button than at the present moment they are inclined to give way to the weight of a burly butcher ; dust will no longer be *swept* up in clouds, it will be led away by electrically-driven suction devices, while artificial sunlight will be provided for the benefit of the staff in those offices still remaining where natural sunlight is a rare and timid visitor.

There is just one other possibility, which the completion of the Electricity Board's scheme will in a few years render practicable. In the event of several of the present broadcasting wavelengths being required for telegraph and/or telephone purposes, on the demand of public safety, the police, or of other national purposes, with electricity served to every householder the wireless programmes could be superimposed upon the light and power mains, and thus delivered from the broadcasting station instead of by the ether.

One hears of objections to cord carriers, but the tide cannot be stemmed. Mechanisation of the service will continue. To this the staff will adapt itself in time as easily as to an escalator. Other administrations are proving the utility of these labour savers, and British offices cannot afford to lag behind. Whether *we* have the best type of apparatus for this purpose it is not my job to decide, but the slide now exhibiting shows an example of a fairly simple and effective type of some I have seen in other countries.

There is also this little machine for folding telegrams, as used in New Zealand. While dealing with this same Colony, the next two slides give some idea of the proportion of counter space given to telegraph traffic compared with the whole of the remaining Post Office activities in Wellington.

It is a measure of the importance of the telegraphs in the eyes of the New Zealand Postal authorities. Home administrations please copy, and make the telegraph user welcome !

Although I have recited the many forces against the Inland Telegraphs, I yet see no cause for despair, despite the jeremiads within and without the service. Provided the service is organised on new lines fitted to the new conditions and upon a basis which will permit mass production of A1 apparatus, there should be a good return for the nation's money. In taking this step, it will need courage of a high order to scrap and to scrap mercilessly, but it will be the only way.

I know with what tender solicitude an engineer looks upon old stocks of relays, printers, typewriters, &c., and one cannot but admire these genuine motives of economy.

There is such a thing, however, as the *economics* of economy, and one always recalls the miser of Molière in these cases !

One event I fully expect to see in the next few years, and that is, side by side with the Postmaster-General will be his assistant the Postmistress-General. Why not ?

There are other things one may only be permitted to *hope* for. In the not too distant future I *should* like to see that the present theory regarding the presumed incapacity of Civil Servants to successfully run a public service had received its quietus, and the reasonableness of the claim admitted that the Post Office itself, by that time administered under a Ministry of Communications, should be permitted to run its services as a whole, balancing its losses by its gains.

This permission to be confined to those services where the public or public policy demanded a first class quality service at second or third grade prices.

Not every 'bus or tram stage is remunerative, nor do all railway freights fully cover expenses.

Even on the Postal side there was a loss last year of 1½*d.* per unit cost of 10*d.* on the 140,000,000 parcels carried, though one heard no protest.

Conclusion.

It may be considered by some that I am belittling the telegraphist craft of to-morrow by emphasising the typewriter keyboard. Far from it, but no one can get away from mechanisation these days, and nothing is gained by kicking against the pricks.

These changes need be feared by no man or woman who knows his or her job. Also, there is more in a telegraphist's job than a knowledge of the typewriter keyboard. The *expert* telegraphist will always be worthy of high pay whether he or she manipulates a keyboard or a Morse key, just as the compositor of to-day, with his linotype keyboard, earns as much, if not then more, than when he lifted every individual letter from his "case" and placed it wrong way round by hand in his composing stick. The Morse code, also, is not yet dead !

Telegraphy a dying industry ? Not yet, anyway, and probably not until that day arrives when Man will find the medium through which he can transmit not the written word, but his thoughts, across the seas !

For the present, let us remember that the gas industry delivers millions more cubic feet of gas to-day than it did 20 years ago. Wireless has not ousted cables ; indeed, cable-designers are now challenging the cross-Atlantic telephone, and they look like winning with a service immune from fading. Broadcasting was to see the supersession of the gramophone. There are more records sold now than ever. The gramophone was going to spoil the piano trade. I am told that last year was a bumper year for the latter.

It is because of these things that my faith in the Inland Telegraphs is confirmed and encouraged. This unwavering attitude on my part is further strengthened by my faith in a staff whose loyalty has been severely strained of late by events which are beyond *their* control or of that of the administration, and yet a staff which will, nevertheless, willingly co-operate with that administration once they are convinced that hope is not dead.

I claim to know something of the doggedness and the team spirit of the telegraphist, and it depends much, very much, upon this spirit of goodwill and doggedness, equally with the genius and enterprise of inventors and the skill of engineers, what the Telegraph Service of this country will be to-morrow.

Success is assured, despite the apparently bewildering new conditions with which the future opens, if wholehearted co-operation is assured between staff and administration.

The reorganisation necessary is not a job of a few months, but of one, two, perhaps three, or even more, years, and the period may be a trying one to everyone.

It is a long time, I know, but everyone also knows that there is no royal road to success here, and that only mutual help and hard work can bring the desired result.

The Telegraphs is not the only industry suffering from economic changes and transition periods.

Professor Gilbert Murray, in his latest book called "The Ordeal of This Generation," dealing with the chaotic condition of affairs, both political and economic, at the present time, gives a very sympathetic estimate of the phase through which our country is still passing. He says "We stand to-day

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between two worlds, one dead, the other waiting to be born," and he pays a splendid tribute to the thousands upon thousands of men and women of to-day in these islands of ours who are sticking to their jobs, plugging along bravely without recognising that they are brave, though the future is blurred and shows nothing much of certainty except, perhaps, the uncertainty.

To such as these the next generation will owe much. It remains to the men and women of the Telegraphs to hand down to that next generation a service worthy of to-day's struggles and disappointments, and it can be done.

REMARKS BY SIR HENRY BUNBURY, K.C.B., AT THE CONCLUSION OF MR. TYRRELL'S PAPER.

I SHOULD like first to express my thanks to Mr. Tyrrell for a very stimulating contribution to this important subject. He has, I feel, taken the right approach to his problem; and after all the right method of approach to a problem is the first requisite for its successful solution. Apart from technical matters, on which I cannot profess to have an opinion, there are few of his propositions with which I should disagree, though one might perhaps give rather more or less weight, as the case may be, to particular factors than Mr. Tyrrell does. For instance, I am inclined to think that he over-estimates the increased competition to be expected from the postal side in the future. It is perfectly true that the scope for an inland telegraph service in small and compact countries like Great Britain, or for the matter of that, Belgium or Holland or Denmark, is very much narrower than in spacious countries like Germany and France, and still more, the United States. But I rather doubt whether, in spite of the great improvement in methods of transport which we anticipate, postal facilities will cut further into the field which is at present open to a telegraph service. The true utility of the telegraph service of the future is, I think, on lines which no postal service can supply. I will come back to this point later.

As regards what Mr. Tyrrell says about the telephones, he is right, I am sure, in pointing out that in general the cost of telephone service is likely to increase rather than to decrease. We can, I think, say this with some confidence as regards those countries where telephone service is at present relatively cheap. I am not so sure, however, that it will ever become necessary to raise telephone charges in this country, where they are at present relatively high. In America, where the tendency in recent years has been to increase charges, they seem to think that they have reached the peak. In their last report the American Telegraph and Telephone Company say: "With the exception of a few places where rates are clearly inadequate, and in spite of the tendency for the cost of furnishing local service to increase as the extent of the service increases, the continuing technical advances in the telephone art and improvements in operation methods, should enable the system to provide ever-increasing service in local areas without further increase in rates." I think, without being too positive about it, that we may hope to achieve similar conditions in this country. Since 1921 British telephone charges have already been very substantially reduced and we have now practically no annual surplus. But if we can do what the Americans expect to do—and there is no reason why we should not—we may hope to avoid raising rates, and, in the alternative, a telephone deficit.

There is one other point on which I should like not so much to differ from as to qualify, Mr. Tyrrell's point of view. In dealing with the relations between the engineering and the traffic and operating services, he puts in a plea for specialisation of function on the lines "that the engineers provide and maintain both line and apparatus in first-class working order while the equally clearly definite duty of the manipulative side is to dispose of the traffic expeditiously." This is right, but is not, I would suggest, complete without another proposition of perhaps even more importance. It is a principle which has become more and more clearly recognised in progressive concerns that it is for the productive or operating side to say what they want equipment to *do*, and for the technical side to produce the equipment which will do it, and will do it continuously and efficiently. I expect that this is the point which Mr. Tyrrell had in his mind and if so I am merely dotting the i's for him. The principle, however, is of such fundamental importance that it is well, I think, to state it quite explicitly.

What I like most about Mr. Tyrrell's paper is that he shows no signs whatever of despairing of the telegraphs, and that he believes in the men who work them. Admittedly telegraph services in all countries, except great continents like the United States are and have for some years been passing through a crisis. Nor is this peculiar to telegraphs. The railways of the United States, in spite of the great prosperity of their country, are under road competition losing traffic more heavily than the British railways, although we do not hear so much about it. I fancy that they are treating their crisis in the way in which a crisis should be treated, viz., looking the facts fully in the face and bracing themselves to meet it. And I am convinced that if we look at the facts about inland telegraphy fully in the face we shall see no reason for throwing up our hands.

Let us suppose that the telephone had been invented before the telegraph, and that only recently some inventive spirit like Colonel Booth had come along with telegraphy as a new idea which had been worked out and brought up to the stage of commercial utilisability. What should we say about it? Should we say that it is of no practical use in this country because the posts, and a 100% telephone development, provide every kind of service that telegraphy could possibly offer?

I don't for a moment think so. The telegraphs, as Mr. Tyrrell rightly says, are "not a dying industry, but a growing one, viewed on the grand scale and the wide horizon." We should, after studying the possibilities of the new invention probably discover at least this, that telegraph line-time is cheaper than telephone line-time, and therefore wherever the spoken conversation is not wanted the telegraph has the advantage over the telephone in conveying the message so long as that advantage is not neutralised by the greater cost of telegraph re-transmission as compared with telephone switching.

There will always, I think, be a very large field for a written message service as distinct from a conversation service, especially for communications with overseas, for which, as Mr. Tyrrell points out, the inland telegraph service is to a large extent the collecting and delivering agency. The problem here is, to what extent will it be economically advantageous for us to convey those written messages *telegraphically* and not telephonically, up to the office of destination or from the office of acceptance. Telegraphy has, in the relative cheapness of telegraph line, a fundamental advantage wherever the distance is considerable, though Mr. Tyrrell's 20 miles strikes me as too low: what neutralises that advantage is the costly process of re-transmission. As a basis I think we may expect to see telegraphic transmission of written messages wherever enough traffic exists, or can be got, to justify a machine-operated direct service. On that foundation it may be that other services of the by-product variety can usefully be built. Then, in the second place, the greater cheapness of telegraph line-time will make it possible to offer telegraphic communication to the public at lower rates than telephone communication where the distance is considerable, and this again should secure to the telegraphs a considerable volume of business which *could* be conducted by telephonic conversation so far as the public is concerned, but comes to the telegraph on the ground of cheapness alone.

Thus telegrams will be necessary for all communications where (1) a written message is demanded, or (2) a telegraphic message can be offered to the public at a lower charge than a telephonic service and is for that reason preferred. And such telegrams will be handled telegraphically wherever the greater cheapness of telegraph line-time is not outweighed by cost of retransmission.

I see, therefore, no reason why we should not expect a steady and even a growing volume of telegraph traffic, operated telegraphically for the whole or part of its course, provided that we exploit to the full, and in every way, the fundamental advantages of the telegraph as now developed; but I think it will be rather a different sort of traffic from that which we used to handle. It may be that these things can only be done by re-casting our equipment and organisation and re-educating our public. Mr. Tyrrell has given us some ideas as to things which are necessary to achieve this end, and no doubt this discussion will produce others. We are very much indebted to him.

CRICKET: NOTTINGHAM *v.* SHEFFIELD.

A PARTY of 22 members of the staff of the Sheffield District Office and Engineers visited Nottingham on Tuesday, June 18, at the invitation of the District Manager's Staff. The primary object of the visit was a cricket match, and this took place under ideal conditions, the weather and the surroundings of the cricket ground being perfect.

Thanks mainly to the prowess of the Engineering members the Sheffield team won by 82 runs. All the other honours of the day undoubtedly went to our Nottingham colleagues, who not only provided excellent refreshments during the interval between the innings of the two teams, but also spared no pains to ensure that the whole of the visitors enjoyed every minute of the visit.

We are now looking forward to the return visit, which we hope will take place early in August.

THE RETIREMENT OF MR. H. P. STEED.

THE position of an Executive Engineer, especially one placed in a large telegraph office, is undoubtedly a highly responsible one. When that office happens to be the capital of the Kingdom, and when the period of the appointment covers nearly the whole of the war and post-war period, the position of the holder of such an appointment cannot be but unique for the demand upon that officer's time, knowledge and tact alone. That Mr. Steed retired from the C.T.O., London, with the best wishes of all those with whom he came into contact from 1915 to 1929, therefore, is the best tribute one could possibly pay him, viewing the duties and difficulties from the commercial as against the technical side. Only those who, from time to time during the years of stress and strain, have been forced to call upon the Executive Engineer to assist, at times it would seem with the impossible, are entitled to correctly appraise the tact, courtesy and whole-hearted co-operation of Mr. Steed. Mr. Steed's earlier years spent in the C.T.O. as a telegraphist, however, served him well, and if the new world of high-speed printing telegraphy seemed to him at moments an over-elaboration of the craft of telegraphy, the beauty of a machine was never lost upon him. Maybe that, now he has more time to devote to his much-beloved hobby of music, and his speciality of the church organ, some of the gadgets he has met with in modern telegraphy may give him new ideas for easing the "foot-work" of his favourite instrument! In any case, a happy retirement, dear colleague and friend!

J. J. T.

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Looking Downwards.

FROM the eminence of that wisdom which comes with advancing years how often we look backwards and reflect, with some measure of amusement, upon the misconceptions of our youth. Now don't turn away, I am not about to commence a sermon, and even if I were there would at least be no need for immediate action until the collection were threatened. The thought came to me and prompted the reference when I felt a line or two of "The Village Blacksmith" running through my head recently.

As a party piece the poem had its merits, but I must confess that I misunderstood it in parts. I used to picture the smith standing beneath the tree with arms akimbo, glaring at a gaping group of rustics. I suppose I formed the notion from the words "Under a spreading chestnut tree the village smithy stands," and "He looks the whole world in the face for he owes not any man." I realise now, of course, that the poet, when he referred to the "smithy," was not being familiar at the expense of the smith but that he meant the house wherein the smith laboured. I know now that to look "the whole world in the face" was metaphorical and indicated a sturdy independence of mind born of a true appreciation of his honesty.

In some mysterious manner it seems that the practice of looking the world in the face is falling into disuse. Whether it be the influence of the Higher Criticism or the Hire Purchase I do not know. Personally I find in myself a tendency to look downwards—and sometimes upwards—instead of looking straight at the world like the blacksmith. And with that desire which prompts each of us to defend an idiosyncracy and to clothe it with an appearance of the rational, I would say that to look downwards has much to commend it. After all, might not the world grow tired of being continually fixed by the eye of even the most estimable of blacksmiths and might it not come to resent the inescapable vision of the normal face? Of course, if you are beautiful it is the world who will look *you* in the face and then you will, quite properly, look downwards—from motives of maidenly modesty and of the need to watch your step.

It was when I was looking downwards recently that I found the harebell —where once there had been fresh grass and shady trees but where now there were only broken bricks, chipped tiles, scraps of wood and heaps of sand. There she stood like a dainty fairy who had forgotten to vanish at the first tint of dawn. Or she may have returned for a moment to look upon a scene once rich in happy memories but which was now fast becoming desolate and I may have surprised her in reverie. She had such a delicate beauty, she looked so fragile amid her coarse surroundings and so pathetic in her loneliness that I took her home. She graced my desk for days and the buds with her opened and seemed to gaze up at her as a queen to be worshipped. They looked upwards in adoration: I had looked downwards in pity.

The harebells have gone and other wild flowers are disappearing, but hope springs eternal in the human breast and any day now I may find sixpence. Who knows!

PERCY FLAGE.

According to a contemporary, Gerrard is to Geneva as "a rushlight to the sun," or, in his own words, "if our telephonists' work of connecting and disconnecting is rather like fast tennis, so many and varied are the duties of a Genevan operator that theirs is fast badminton, golf, tennis, stoolball, lacrosse, hockey, billiards, quoits, polo, bowls, croquet, football and cricket! They have to describe the weather at any given place, say what won the Swiss equivalent to the Derby, know when the last Sunday excursion train leaves some distant froghole up in the Alps for another obscure huddle of chalets out in the wilds (the question often being asked in German or Italian!) give the address of the nearest chemist, repeat the names and addresses of every single person who rang up Monsieur T. while he was away in Zurich—or Yokohama; tell Mademoiselle C.'s friends when they ring that Mademoiselle has gone to chez Henri for the evening, and transfer them to that number"; and so on and so on. The article concludes "There are still more duties which the operator has to undertake, but enough have been instanced, I think, to render highly improbable any considerable rush of emigration from Gerrard to Geneva."—And to this mild surmise we subscribe heartily.

To a Colleague.

Seated one day in the school-room
I was weary and ill at ease;
And it took me all my time, lass,
To mind my Q's and P's—
Till at length I asked for a casual
When the hour was nearing ten;
And soon with my fellow jail-birds,
I was cheerfully saying "When?"

Some café-au-lait and a biscuit
Soon worked like a potent charm;
And refreshed my wearied spirit,
Restoring my wonted calm.
When I drifted back to the Lecture,
I was feeling twice the man;
Whereas before the treatment
I was merely an "also ran!"

Now, it may be that one fine morning
You'll report at the Auto-School;
So take this tip from your mess-mate
And keep this unwritten rule:
If you find your wits a-wandering
And you cannot concentrate—
Just toddle out and "have one"
And your brains will soon scintillate!

C. A. S.

Contributions to this column should be addressed: THE EDITRESS, "Talk of many Things," *Telegraph and Telephone Journal*, Secretary's Office, G.P.O. (North), London, E.C.1.

NEWCASTLE NOTES.

Operator! operator!!
Where are you now?
While I ring and I ring
And I shout Hell-ow!
Are you drinking your tea
Or powdering your nose
Or mending that hole in
Your smart silken hose?
What! You've been
busy!
Oh come, that's not true.
No sub. would
ever
Believe that of you.

J. H. W.

Sometimes, however, we do get the ha'pence, and letters such as the following are very gratifying:—

"Dear Sir,

METRO-VICK HOUSE.

We would like to take this opportunity of expressing our thanks and gratitude for the very expeditious and thorough way in which you have dealt with the telephone arrangements in our new building.

We were able, through the thought of your staff, to continue our business during a somewhat difficult changeover without the slightest telephonic interruption.

Knowing full well that you get more kicks than pence, it is an added pleasure to us to express our sincere thanks for the great assistance you have been to us in the matter of the telephones.

Yours faithfully,
METROPOLITAN VICKERS ELECTRICAL CO., LTD.,
(Signed) H. PATERSON, *District Manager*."

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LONDON TELEPHONE SERVICE NOTES.

Contract Branch Notes.

THE business done by the Contract Branch during the month of June resulted in a net gain of 2,822 stations as compared with 2,542 last year. The net gain for the June quarter amounted to 11,664 stations as compared with 11,146 in the corresponding quarter last year.

The smallness of the increase over last year's figures is disappointing. As an antidote to this disappointment we have been looking up the figures for new business since 1912 and we find that new business (excluding transfers) for the quarter just finished amounted to 21,240 stations, as compared with 7,222 in the corresponding quarter in 1912. Certainly we have grown in the meantime, but we do not intend to rest on our oars.

A new library recently built in the Burroughs at Hendon has a tower or turret on the top which is very much like a telephone kiosk. One day someone with an eye to a practical joke put one of our signs, "You may telephone from here," on it, just at the time when one or two people going past the building were looking for a call office. One enquired inside for the call office and would not be convinced there wasn't a call office, but when he got outside again and looked up the sign was gone! I wonder how many people were taken in? Two at least wrote letters to the local press about it.

Our best wishes to Mr. J. H. James, Contract Officer, Class II, on his transfer to Brighton.

* * * *

Contract Branch Cricket.

In the fourth match of the series of league games, played at Chiswick on June 25, the Traffic Department succeeded in winning. Scores: Contract Branch 103, Traffic Branch 119 for 6 wickets.

This result finally disposes of the Contract Branch's chance of retaining the Cricket Shield, the destination of which was settled in the match between the Accounts Branch and the Traffic Branch played on July 9, which resulted in a win for the Traffic Branch, who are the new champions for the season.

* * * *

L.T.S.—Bowls.

The team's run of success in the league tournament was arrested by the L.P.S. in the game played at Chiswick on June 20, 1929. In the sixth game of the tournament, five of which have been won, the L.P.S. triumphed by 66 shots to 60.

It was, like many other games this season, a most exciting contest and once again the result of the match depended on the last end of the game.

Fortune and good bowling favoured the L.P.S., and they eventually proved worthy winners of a most interesting and enjoyable match.

* * * *

L.T.S.—Cricket.

A very interesting position was revealed when the Accounts Branch met the Traffic Branch on Tuesday, July 9, in what was generally regarded as the "needle" match of the tournament, when the destination of the League Shield would be decided. Up to that time the former were an unbeaten side, having dropped only one point. On the other hand, the Traffic team had experienced defeat at the hands of their opponents at the first meeting and were therefore a point behind. The Traffic Branch required to win to enable them to hold the trophy, whilst a draw would suffice to enable the Accounts Branch to regain the honour. Such was the atmosphere when the game began. "Captain" Drabwell, of the Accounts, won the toss and decided to put in his opponents. Following a pre-concerted plan of campaign, the first four Traffic batsmen "laid on the wood" with great gusto to the extent of 106 runs. The remaining seven "had to go," and the side were out for a total of 118 runs. The Accounts then set out to knock off this total. An astonishing collapse set in after the departure of Taylor, seven wickets falling in quick succession for only 25 runs. With the advent of Drabwell and Lewis, however, a change took place, and for 35 minutes this dour pair made a stand—but without adding materially to the score. The steady and accurate bowling of Crossley and Merrick eventually told, and the intrepid batsmen followed their predecessors to the pavilion. When the last man came in the keenness of the fielders intensified. As the rival captains had agreed to draw stumps at 8 o'clock many anxious glances went towards the clock, which now indicated a period of only a few minutes in which to dispose of one of the last two batsmen. They both survived until a minute to eight, when, after a consultation between the umpires, it was announced that the last over should be delivered. Excitement ran high and the Traffic men were on their toes. The first four balls were sent down without incident. The fifth, however, was a snorter from Crossley, and it caught Moyle napping and spreadeagled his stumps. The Traffic team had won. Whilst enthusiasm ran high among the victors commiseration was expressed with the losers, who had so narrowly missed obtaining the necessary point to enable them to regain the shield. Thus the match ended, and a more exciting finish could not be wished for. The contrast between the two sides when fielding was marked, and it can be said truly that the winners gave nothing away—until after the match.

Scores:—

Traffic Branch.		*Accounts Branch.*	
Thomson, b. Taylor	32	Taylor, l.b.w., b. Merrick ...	12
Leaver, b. Taylor	2	Oliver, c. Webb, b. Merrick ...	2
Grove, c. Oliver, b. Moon ...	24	Vacher, l.b.w., b. Crossley ...	4
Meyer, l.b.w., b. Moyle ...	26	Moon, c. Leaver, b. Merrick ...	0
Webb, b. Moyle	4	Young, c. Adams, b. Merrick	1
Crossley, c. Oliver, b. Moon ...	2	Smith, c. Walby, b. Merrick ...	6
Adams, c. Boston, b. Moon ...	0	Pick, b. Merrick	0
Bishop, c. Oliver, b. Moon ...	4	Drabwell, b. Merrick	11
Walby, l.b.w., b. Moyle ...	0	Lewis, b. Crossley	0
Merrick, not out	1	Moyle, b. Crossley	1
Hancock, b. Moon	0	Boston, not out	2
Extras ...	23	Extras ...	8
	118		47

The annual encounter with the A.G.D. was played at Chiswick on July 2.

The A.G.D., as on every previous occasion, succeeded in winning fairly comfortably, the scores being: A.G.D. 109 for 7, L.T.S. 73.

Although the record of the L.T.S. in inter-departmental games is a poor one, there is sufficient talent now available to offer much stronger opposition to other service departments, and consideration might profitably be given to the arrangement of matches between picked L.T.S. teams with the object of building up a strong L.T.S. eleven.

* * * *

L.T.S. Sports Association: Tennis.

Progress is being made in the "Agnes Cox" and "Pink" Competitions. The following teams have so far been successful: in the former, Controller's Office teams A/cs A.R.5, A.R.4 and A.R.1, Staff Section R.1 and Chiswick, Central and Avenue Exchanges, and players representing Maryland, Grangewood, Enfield, Victoria, A/cs A.R.1 and Staff Section R.1 in the latter.

The Committee have arranged a meeting to fix the dates of the finals, which will be duly announced in the next issue of this Journal.

* * * *

Hockey.

As the result of the discussion at the General Meeting, a meeting was held on July 17 to form a Hockey Section and arrange an inter-club competition during the coming season. Owing to the unavoidable absence of Mr. Hugh Williams, the Chair was taken by the General Secretary, Mr. George Lewis. Representatives from Sloane, Battersea, City, Hop and Trunks attended. Miss Grist, of the Trunk Exchange, was elected Hon. Secretary, and a Committee was formed consisting of one representative from each club or proposed club.

It was decided that all exchanges unable to form a separate club organise a composite club. It was also decided that the Committee should arrange a competition, but the question of a trophy would have to remain in abeyance, as the Women's Hockey Association prohibited such contests. A discussion then took place with regard to grounds for clubs not already provided for, and it was decided to request the newly-formed Committee to attend to the matter.

The good attendance and keen interest shown at the meeting indicated that the Hockey Section of the L.T.S. Sports Association is bound to be a success.

LONDON ENGINEERING DISTRICT NOTES.

Cable Breakdowns in London Subways.

REFERENCE has been made in previous notes to the serious dislocation in telephone traffic due to the fires in the Victoria Embankment subways.

Enquiries were held on each of the two large outbreaks in the Victoria Embankment subway by the City Coroner, and evidence was taken from officials representing the Post Office, the London County Council and other undertakers who owned plant in the subways.

The subway is owned and maintained by the London County Council, and subject to certain conditions as to payment, &c., permission is given for undertakers to place plant in the subway. At that part of the subway where the fire occurred there are gas, hydraulic and electric power mains,

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telegraph and telephone cables. The London County Council also had a system of electric cables with a number of service leads supplying current to the lights in the parapet of the embankment.

The finding of the jury was that the fires were due to defects in the L.C.C. electric lighting cables, and they recommended that these cables should be replaced as early as possible by a more modern system. This replacement was being carried out when the second big fire occurred. This was found by the jury to have been caused by sparking at the junction of the old electric light cables with some temporary leads which were in use pending the completion of the new system.

It is stated that when the new system is completed the Victoria Embankment will be one of the finest lighted thoroughfares in the world. This is satisfactory, but it is unfortunate that so much injury was caused to the telephone cables, which are as incapable of causing fire as any electrical plant can be. There is, however, another and brighter side to the picture. Some of those who saw the great molten mass of metal and twisted wire that had once been cables thought that the restoration would necessarily take months and that there would be great delay in restoring service. So effective, however, was the co-operation, and so strenuously did the Post Office staff in the subway strive to evolve order out of chaos that within two or three days a fair service was being given, and within a fortnight telephone traffic was being carried as usual.

Promotion.

L. F. Worthy, from Chief Inspector to Assistant Engineer.

Transfers.

A. W. Whittaker, Inspector, N.W. District, to London Engineering District.

J. E. Gilbert, Inspector, Scotland East District, to London Engineering District.

Retirement.

A. E. Bebington, Inspector.

Presentation to Mr. J. H. Watkins.

On Tuesday, June 25, Mr. Watkins, on proceeding to a few days' annual leave, bade farewell to the L.E.D. prior to taking up his appointment as Sectional Engineer at Bangor. On the previous evening he was presented by Captain Hines (on behalf of his personal friends and colleagues) with a case of two pipes, a leather tobacco pouch, and other smoker's requisites. Messrs. Dolton, Hay and Hill also expressed their regret at Mr. Watkins' departure, whilst congratulating him on his promotion. Mr. Watkins briefly and suitably replied.

Opening of Automatic Exchanges.

The following automatic exchanges were opened during the month of July :—

Name.	*No. of Equipment Lines.*	*Date opened.*	*Manufacturers.*
Beckenham ...	3,000	July 3, 1929	Siemens.
Reliance	2,700	July 11, 1929	General Electric Co.
Maida Vale ...	7,500	July 20, 1929	Siemens.
Edgware	1,300	July 20, 1929	General Electric Co.
Fulham	7,500	July 27, 1929	Standards.
Manual Exchanges.			
Emberbrook ...	C.B. No. 1	July 31, 1929	Standards.

Exchange Transfers.

Chancery.—On July 27, at 2 p.m., Chancery Manual Exchange was transferred to Terminus Exchange, where it will function hypothetically.

General.—The restoration of the service, following the "fire" referred to above, and the implementing of the foregoing programme has necessitated the closest co-operation between all Engineering Officers concerned and also between the London Engineering District and the London Telephone Service.

The final operations at the time of cutting out the old exchange and cutting in the new are but the culminating acts in the practical application, over a long period, of many and diverse economic and technical considerations.

The problems arising from the conversion of London's telephone system are many and difficult, but the successful achievements during July, 1929, show that with good will, good temper and good work, these problems can be solved with credit.

GLASGOW TELEPHONE NOTES.

Miss A. McL. Cunningham, Telephonist, Central Exchange, who has been with us seven years, has resigned the service to go to Vancouver.

The staff presented Miss Cunningham with a gold wristlet watch and she carries with her our united good wishes for health, wealth and prosperity in the new country.

On Relaxation and Holidays.

"I've been saving up out of my wages for a year just for this vacation. I intend to spend it like a lady if I never do another one. I intend to get up when I please instead of having to crawl out at seven every morning; and I intend to live on the best and be waited on and ring bells for things just like rich folks do. Now, I intend to have the happiest time of my life. Then, I shall come back to my work and my little hall-bedroom satisfied for another year."—(O. Henry.)

"To the body and mind which have been cramped by noxious work or company, nature is medicinal and restores the tone. The tradesman, the clerk comes out of the din and craft of the street and sees the sky and the woods, and is a man again."—(Emerson.)

"The jug of wine and loaf of bread and Thou in the wilderness business is about as much rest and pleasure to me as sliding down the bumps at Cony would be to President Taft. . . . Give me a big city for my vacation."—(O. Henry.)

"There is moral as well as bodily wholesomeness in a mountain walk, if the walker has the understanding heart, and eschews picnics. It is good for any man to be alone with nature and himself, or with a friend who knows when silence is more sociable than talk. It is well to be in places where man sees all around him what has the same look as it had a thousand years ago. It abates and rectifies the man, if he is worth the process. As the body, harassed with the noxious air of cities, seeks relief in the freedom and the purity of the fields and hills, so the mind wearied by commerce with men, resumes its vigour in solitude, and repairs its dignity."—(Sydney Smith.)

"Let us praise God in gladness and humility for all great and simple joys; for games and holidays in the open air; for the beech trees in spring and the fruit blossom; for the smell of the country after rain; for the green grass and the flowers; for cloud and sun and hills and mountain streams; for all pure comedy and laughter, and for the gift of humour and gaiety of heart."—(Commemoration of St. Francis.)

CIVIL SERVICE COMMISSION.

Forthcoming Examination. — Male Assistant Superintendent of Traffic (Class II) in the London Telephone Service and Male Assistant Traffic Superintendent in the Provinces, General Post Office (18—23, with extension for service in H.M. Forces).

Regulations and particulars, together with the forms on which applications must be made, will be sent in response to requests (preferably by postcard) addressed to the Secretary, Civil Service Commission, Burlington Gardens, London, W.1. The latest date for the receipt of application forms is 29th August.

The Shanghai Mutual Telephone Company, Ltd.

TELEPHONE LINE FOREMEN.

The Shanghai Mutual Telephone Company, Limited, require the services of two Foremen thoroughly experienced in telephone line construction and maintenance work. Age 24 to 30 years, preferably unmarried. Commencing salary 300 taels per month (approximate value of tael 2*s.* 6*d.*). Applications, stating age and giving brief particulars of training and experience, to be sent to Messrs. Preece, Cardew & Rider, 8, Queen Anne's Gate, Westminster, S.W.1.

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"Golf."

The definition of a modern fool, according to an acquaintance, whose hobbies are gardening and poultry keeping, is to be a player of ball games, especially that of golf. To hear him is to be persuaded that the golfer is one of life's failures: one of those ineffable men—insensible, brawny—who think that all that matters is to be a sportsman and a good fellow: whose main ambition is to roll silly little balls over the grass into silly tin holes in a smaller number of strokes than anyone else.

Bearing these strictures in mind, I was recently persuaded to play my first game of golf on the occasion of the District Office (annual) competition at Cardross, on the banks of the Clyde, and thus qualify for entrance into the ranks of those who, according to the authority referred to, are "blessed" with an obliquity of understanding.

The desire to see oursels as ithers see us, says G.B.S., makes us the moral cowards that we are; and that other genial Irishman, Sergeant Cassidy, with an even greater perspicuity, tells us it is better to take amoosement from what others think about us and—give it no heed. Therefore I played golf.

I cannot say that I have succumbed to the fascination of the game as yet, but I have learnt that it is extremely easy to send a golf ball in an entirely different direction from that which one intends, or, easier still, to miss it altogether. I learnt also to become absorbed in the business of keeping the head still to keep the eye on the objective, to drive the ball in the way it should go when I did connect, and on the greens to be painstaking—qualities, especially that of a still head, which are not the marks of a low intelligence. I also learnt consistency. Over an 18-hole course my outward score was 90 and the inward score the same, my opponent's being 50-50.

The prize-winners were:—

(1) Mr. W. Campbell;
(2) Mr. J. M. Harvey;

and Messrs. R. F. Gilchrist and T. Rowand, who tied for third place.

A BRIEF CHRONOLOGY FOR STUDENTS OF TELEGRAPHS, TELEPHONES AND POSTS.

By HARRY G. SELLARS.

(*Continued from page* 188.)

1881, May 14 ... Silvanus P. Thompson published an exhaustive work on "Electricity and Magnetism."

M. Brasseur, of Belgium, supported Hughes' method of preventing induction on telegraph lines.

Baudot obtained a diploma of honour at Paris Electrical Exposition.

Volta Laboratory Association formed by Alexander Graham Bell, Dr. Chichester Bell and Charles Sumner Tainter, for the purpose of studying and elaborating ideas, inventions and discoveries relating to the art of transmitting, recording and reproducing sounds. The capital of the Association consisted of the Volta prize of 50,000 francs, which had been awarded to Graham Bell for his invention of the telephone.

First London theatre—the Savoy—lighted by electricity.

Thomas Alva Edison invented a current-meter.

Electric railway opened in Berlin.

M. Volk & Co. installed the first English electric railway at Brighton.

Telephones introduced into Isle of Man.

1881, Aug. 9 ... Electric lighting first used in mines (at Hamilton, Scotland).

1881, Dec. 3 ... Postal Telegraph Clerks' Association formed at Liverpool with Thomas Morris as General Secretary.

Compass needles in London pointed 18 deg. 33 mins. *west* of the true north.

Angle of "dip" in London, 67 deg. 39 mins.

Special revenue stamps for telegrams discontinued.

Penny stamp available for either postage or Inland Revenue issued. Separate telegram stamps abolished.

Fawcett revision of pay, &c., in the Post Office took place.

1881, Dec. 31 ... Fifteen telephone exchanges in London serving 1,338 subscribers.

1882, Jan. 1 ... British Postal Order Service extended to Gibraltar and Malta.

1882, Jan. ... Postmaster-General expressed the view that in the public interests rival telephone exchanges should not be established in one town.

W. E. Irish patented a telephone switchboard with a rotary switch for establishing communication between the operator and the caller.

J. E. Kingsbury published *The Telephone in Principle and Practice, its Origin and Development.*

A. W. Heaviside devised a metallic circuit system of telephones known as the "North East (Northern)" system.

1882, Feb. 16 George Lee Anders patented a central battery system of telephone working.

(T. F. Purves and J. Fraser also devised central battery systems.)

Edison devised a shunt wound dynamo with a drum-wound armature.

Dr. Hopkinson improved Edison's dynamo and, in collaboration, produced a dynamo for electric lighting, the armature of which could be coupled directly to a steam engine.

Elihu Thomson and Edwin J. Houston produced a dynamo providing a constant current for arc lamp lighting.

Col. R. E. B. Crompton made improvements in Bramme's dynamo.

Ferranti, Ganz, Gramme, Kapp, Mordey, Parker, and Westinghouse devised current alternators for electric lighting.

1882, June ... Sir Charles Bright patented an electrical accumulator of reduced weight, more effective action and simpler construction.

Dr. Fleming constructed a battery with copper and lead, the two separated liquids being sodium persulphide and nitric acid. He also produced a direct reading potentiometer.

Major Cardew invented a "hot wire" voltmeter.

M. Paul designed a direct reading movable coil micro-ammeter.

Kelvin invented an Ampere Balance and an Electrostatic Voltmeter.

G. F. Fitzgerald suggested that a Leyden jar might be used to produce electro-magnetic waves.

Crompton constructed a clockwork regulator for adjusting electric arc lamp carbons automatically, and devised a method of measuring electro-motive force.

Barclay, Boltzmann, Gibson, Silow, Wuellner, Gordon, and Hopkinson measured the inductive capacity of various liquid and solid bodies.

Hopkinson calculated the magnetic permeability of various metals and introduced a formula for calculating the number of magnetic lines proceeding from an electro-magnet.

H. A. Rowland fixed the magnetic susceptibility of Norwegian iron at a figure rising to 366 units, of cobalt 800, and of nickel 494. Ewing found that the magnetic susceptibility of thin soft iron wires went up to 1,300 or 1,400 units.

1882, May 24... Marr and Moseley, of Manchester, patented a granular carbon telephone transmitter with an ebonite diaphragm.

S. Bidwell patented a telephone receiver.

Gurney, Genest and Mix devised telephone transmitters.

1882, July 17 Postmaster-General decided to grant telephone licences to all responsible persons who applied for them, even where a Post Office system was established.

1882, Aug. 9 ... Silvanus P. Thompson and Philip Jolin patented the Valve Telephone Transmitter, the essential part of which resembled a mechanical ball-valve.

1882, Aug. 12 Postmaster-General (Henry Fawcett) did not think there was any possibility of the Government buying the rights of telephone companies.

1882, Aug. 18 An Act of Parliament granted to the Railway Clearing House, acting on behalf of the railway companies, eleven-twentieths of the postage collected upon parcels carried by rail.

Barclay introduced a printing telegraph system using a keyboard perforator and printing the received message in page form.

(*To be continued.*)

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THE

Telegraph and Telephone Journal.

VOL. XV. SEPTEMBER, 1929. No. 174.

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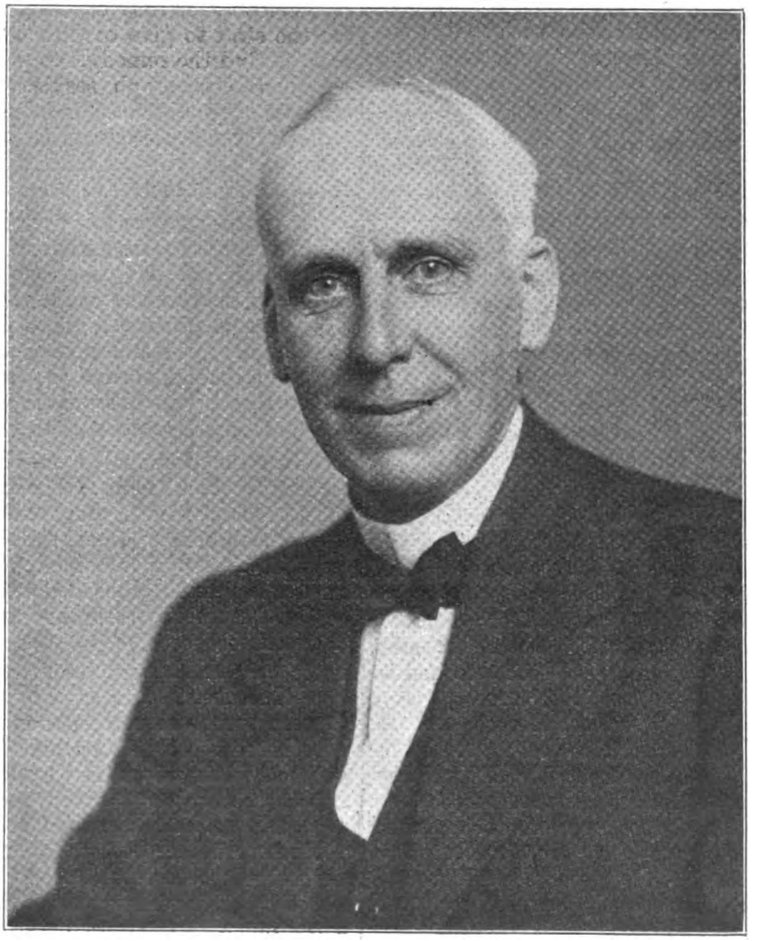
TELEGRAPH AND TELEPHONE MEN AND WOMEN.

LXVIII.

MR. HORACE DIVE, M.B.E.



WHEN the Post Office commenced exchange working in London, a number of likely young men on the established clerical grades were selected to fit into the new telephone organization. So in 1905 Dive, who had for 8 years trod the peaceful path of an A.G.D. Second Division Clerk, found himself suddenly an Exchange Manager, called upon to face the cold wind of criticism which inevitably blows upon a public service and reacts on those who administer it.

The Exchange Manager of 24 years ago has grown with the system, grown in experience, in outlook, and in knowledge. That he is now Assistant Controller is the justification for the original selection and a fitting crown to a life of hard work, tempered by an outstanding sense of humour, and guided by a keen mental alertness.

While in essentials telephone traffic questions may change little, methods are ever changing. To keep abreast of the changes is no easy task, and it says much for Dive's adaptability, his easy grasp of affairs and his organizing flair that the transition from manual to automatic working in the London area has become part of the normal day's duty to be taken in one's stride.

His gift of pungent speech, spiced with incisive wit at times a trifle mordant, has been in evidence at more than one official conference and staff society, while his presence, and the easy badinage of which he has an inexhaustible supply are always welcome at social gatherings. The possession of an attractive personality is not the least of his assets.

Has he hobbies? He was a member of the Middlesex County Council for 3 years and is still on its Education Committee. But in case that should seem too much like work to be called recreation, he joined a Golf Club but never plays. When there is an evening at home his children and his garden claim it; a delightful ending to a busy day.

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HOW TO IMPROVE THE TELEGRAPH SERVICE.

VIII.—A POSTSCRIPT.

THE *T. & T. Journal* may, I think, justly be congratulated on the series of articles on "How to Improve the Telegraph Service" which has appeared in the last seven numbers. The articles show that men in all departments of the Telegraph organisation are thinking, and thinking constructively, about the future of the service and its needs. Written from different points of view, they reveal a substantial measure of uniformity of opinion. In particular, the contributors are at one in believing that the telegraph service has still a great function to perform, and that the "human material" at its disposal is capable of responding to the highest demands that can legitimately be made of a telegraph service. The complete absence of any note of despondency or defeatism is gratifying. There is, also, a good deal of common ground as to what is wrong with the service and what can be done to make it a better servant of the public.

If I may begin with a word of criticism, I think that the writers, or most of them, are too apt to assume that the responsibility for what is wrong lies exclusively at the door of the administration. It may be freely (even cheerfully) admitted that in past years the administration has made mistakes; and there is no reason in the nature of things why the administration of to-day should be exempt from the general human liability to imperfection. But that liability attaches to the administration neither more nor less than to any other branch of the service. On the face of it, there is something untrue to life in the picture of a telegraph service in which only the administration fails to do its job perfectly. Yet that is the sort of picture suggested by most of the articles. One misses, too, any attempt to appreciate the special difficulties with which the administration has been faced during the last few years. But to this point I will recur later.

The suggestions made by the writers of the articles are many and various, and cannot all be discussed, or even enumerated, within the limits of a single brief article. They may be divided into two categories, according as they relate to the facilities afforded to the public, or to the internal organisation of the service.

To the former category belong suggestions for extended hours of service, for abolition of the charge for telephoning telegrams and the extra Sunday charge, and for reduction of the charge for a registered abbreviated address (which, by the way, another contributor would increase!). The first of these has recently been met to some extent. The others can scarcely be adopted unless the financial position of the service is to be regarded as a matter of entire indifference; and to the unfortunate administrator, however much he may desire to help the telegraphing public, this "hang the cost" attitude is a forbidden luxury.

In the same category fall the suggestions for differential rates for different classes of traffic. Differentiation is suggested on the basis of (*a*) distance, (*b*) speed, (*c*) character. A "zone" tariff has its attractions, but it is not so obviously fair as it appears to be at first sight (a telegram sent over a distance of 100 miles in two transmissions costs much more to handle than one sent 300 miles in one transmission), and it has always been rejected as unsuited to British conditions. The "urgent" telegram has similarly been rejected on the ground that it could not be of much use unless the ordinary service were degraded to a considerable extent. The "deferred" telegram might be a sound scheme if the ordinary tariff were on a paying basis: but as things are we cannot afford to accept telegrams even for transmission in the slack hours at a rate sufficiently below the ordinary rate to attract traffic. This applies also to "travellers' telegrams" and "greetings telegrams," if a reduced rate is suggested (the American Commission proposed "greetings telegrams" at the ordinary rate).

One novel—not to say revolutionary—suggestion is that of using petrol stations with continuous service for telegraph purposes. This idea seems at first sight to be beset with difficulties; but it is not for that reason to be rejected out of hand.

It is common ground among most of the contributors that whatever facilities we offer ought to be well advertised. There is room for difference of opinion as to the value of advertisement for a monopoly service which is long-established, and the existence and uses of which must be familiar to anybody who could ever have occasion to use it. (I am speaking here, as throughout, of the inland service, which is not faced with direct competition such as exists to some extent in the overseas service.) Personally I do not believe that advertisement is likely to have any serious effect on the volume of inland telegraph traffic. But I believe it to be right that the telegraph service should abandon its somewhat Olympian aloofness from the public, and, in particular, that useful facilities which may not be so well known as they ought to be (phonograms and night letters) should be kept in the public eye by modern advertising methods, suitably adapted to the requirements of a Government Department.

To turn now to the second class of suggestions, we have a pretty general agreement that the service is not at present as rapid as it should be, and that it needs a more generous provision of staff and wires. In other words, it seems to be generally assumed that to some extent efficiency has been sacrificed to economy. To this point I will return in a moment, after saying a word about some of the other suggestions which fall under the head of internal organisation.

The suggestion, made by one or two of the contributors, that the telegraph staff should have better prospects is one with which everybody must sympathise. Not only from the point of view of the men and women affected, but from the point of view of the efficiency of the service, lack of adequate prospects of advancement is a thoroughly bad thing. It not only bears hardly on individuals; it inevitably creates an atmosphere in which it is very difficult for the staff to give of their best. But it is easier to see the evil than to find the remedy. A policy of creating higher appointments within the telegraph service for the sole purpose of providing avenues of promotion is indefensible; and the possibility of finding outlets for telegraph staff in other branches of the service, or in other Departments, is limited by the claims of officers already in those other branches or Departments.

A greater degree of specialisation is recognised by some of the contributors as a condition of increased efficiency; and stress is rightly laid on the necessity of thorough training both on the operating and on the engineering side. So far as the question of apparatus is discussed, there is a consensus of opinion in favour of the policy of standardising a minimum number of types, and of adopting the teleprinter to the greatest practicable extent. One of the writers sees advantage in transferring responsibility for the maintenance of apparatus to the Traffic side.

But the principal demand is for more staff and (to a lesser extent) for more wires. The reduction of operating staff through the adoption of the staffing standards, and of delivery staff through the introduction of the "walk" system, and the suspension of a certain number of direct circuits, seem to be regarded as mainly responsible for an alleged deterioration of service. It is here that the difficulties of the administration appear to me to be insufficiently realised.

The inland telegraph service has been worked at a loss practically ever since it was taken over by the State, and markedly so since the sixpenny telegram was introduced. Nobody seems to have worried very much about that while the service was expanding and the national finances were in a healthy condition; but the rapid decline of traffic during the last few years, coming at a time when stringent economy has been required of the public services, has forced the administration into a position in which it could not ignore the deficit and concentrate on the provision of a service of maximum efficiency. No sane person, I think, believes that the deficit can be wiped out with the present tariff; and it is highly doubtful whether

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any practicable increase of the tariff would help very much. Anybody fully conversant with the facts would probably agree that—at any rate unless there is an almost miraculous reversal of the traffic curve—the inland telegraph service must continue indefinitely to be carried on at a substantial loss, which can be justified on the ground that (despite any conceivable growth of the telephone system) the business and social interests of the nation require, and will continue to require, a telegraph service accessible to all. But it must equally be admitted that public opinion would not tolerate any marked increase in the deficit The administration is bound to aim at reducing the deficit if possible, or at least at keeping it somewhere about its present level.

"Efficiency" is a relative term. An efficient telegraph service is one that maintains a certain standard; but the standard must be in a sense arbitrary. Obviously, we could give the public a more rapid service than we have ever given if we chose to provide direct wires for very small traffic loads, and to staff telegraph counters, instrument rooms and delivery rooms on a "no-delay" basis. But a service with an inherently unremunerative tariff cannot afford to be so generous. What we have tried to do is to maintain the long-established standard of service—which is a reasonably good one, regard being had to the fact that we aim at equal service for all—while taking advantage of the legitimate opportunities for economy which are offered by technical developments. If we have not wholly achieved that object, we have not fallen short of it—as one of the contributors reminds us—nearly so much as is often supposed. To some extent we have been "let down" by unsuspected weaknesses in our modern apparatus, though it is only right to add that the teleprinter, which is (so far as can be foreseen) the instrument of the future, bids fair to give us a very high degree of stability. Factors of a psychological nature have also intervened. But I believe it to be true that the service is recovering from the set-back which followed the recent revisions of telegraph staff in the large offices, and that, if our performance is judged by what we have done in the past, and not by some ideal standard, or in relation to isolated cases in which an exceptionally rapid service was provided before we were forced to consider so narrowly how much we could afford, there will be found to be little ground for the charge of serious deterioration.

One need not rest content with that. We should all like to give a better service than ever; and improved technique ought to make that possible. But the deficit is a limiting factor. We have to reduce the deficit if we can; at any rate we must avoid a larger deficit. Is an improved service possible within the limits thus set? The recommendations of the American Commission are an attempt to answer this question in the affirmative. In many ways they involve increased cost. Standardisation of apparatus (with consequential scrapping of much that might still be useful); unified control of operating and apparatus; time-stamps and hand-gummers; reduction of supervising areas; regular rest reliefs for telegraph operators; acceleration of delivery in business areas; typewriter reception; publicity and canvassing—these things cannot be done without considerable expense. On the other side, the proposals for a more economical lay-out of large instrument rooms, for a higher degree of specialisation, for higher outputs on the more important circuits (with concurrent abolition of the "carry-over") and for some measure of payment by results are designed to secure savings which will enable the added expense to be borne. I believe that if the recommendations of the Commission were carried out in their entirety (and they are essentially parts of a single whole) the service could be improved without any addition to the deficit, and probably with some reduction (though of course in this connexion a great deal depends on the future trend of traffic and wages). But clearly that object could not be attained if only the measures which cost money were to be carried out. Its attainment demands the co-operation of all the various parts of the telegraph organism in an effort to make increased efficiency compatible with that regard for economy which circumstances dictate. It is scarcely necessary to add that it is in the best interests of the staff, no less than of the administration, to give the public a service of maximum efficiency. L. S.

THE ACCOUNTS BRANCH AND THE CALLING RATE.

By R. S. Grosvenor, Gloucester.

The Accounts Branch is consistently in touch with subscribers at the most vulnerable point—the pocket.

The relationship between the Accounts Branch and the calling rate is, perhaps, not immediately apparent, but it nevertheless exists and is of considerable importance. A rigid system in respect of the collection of quarterly accounts from thousands of subscribers, involving very many thousands of pounds, is essential. The administration of that system, however, calls for the greatest tact, not only in order to avoid the possibility of subscribers curtailing use of the service, but by means of accurate, prompt and courteous treatment in every case, fostering popularity and so encouraging greater use.

To send a subscriber an account is a comparatively simple routine matter, but any query subsequently received in connexion with that account requires very careful treatment. As an example, for a subscriber to write a three- or four-page letter, and to receive a printed postcard acknowledgment to say that the matter is receiving every attention does not create anything like such a good impression or feeling of confidence as a short, carefully worded, duly signed letter. The importance of this point is even more appreciable when a subscriber makes a service complaint in addition to raising a query or seeking information regarding an account.

Correspondence in connexion with deposits requires most careful treatment or undoubtedly a tendency to curtail use of the telephone is engendered. Cold formality tends to "freeze" a subscriber and should be well tempered by the personal element in order to counteract necessary purely formal statements. In a few words, subscribers' confidence should be sought and maintained in order to avoid anything in the form of prejudice with consequent distrust, apathy, and probable curtailment of use. An idea that an overcharge has been made, and paid, rankles and is distinctly dangerous to the interests of the service.

This feeling would be serious for any ordinary business concern; how much more so, therefore, in perhaps the largest business in the world existing for the public service only—the British Post Office.

The standard of accuracy maintained in our accounting system, bearing in mind the millions of transactions that are dealt with each quarter, is surely an achievement of which to be proud. Much can, however, be done by the Accounts Branch to popularise the service. It cannot be too strongly emphasised that care and tact in the treatment of correspondence on all accounting matters is of the first importance.

A very courteous and definite reply to telephone enquiries should be given. Again the personal element enters into the matter and the subscriber should always be left with the impression that the enquiry has been or will be fully and correctly dealt with.

This, of course, equally applies to an interview with a subscriber making a visit for enquiry or information. In this case, a feeling of personal welcome in opening the interview should always be given to *the customer*. During the course of the interview opportunity frequently occurs to sow really good seed by dealing with the business on hand in an expeditious, confident and definite manner so that the subscriber leaves not only satisfied that the case has been correctly handled but with a firm feeling of confidence in the service generally. There is an old saying that in order really to know a person see him in his home. This is also, of course, a truism in business.

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A further word with reference to service, &c., complaints received when accounts are paid. Such complaints are, of course, very varied in nature, and range from a subscriber who states he has been intending to bring a certain point under notice for some time to one who has experienced difficulty on the day the account is being paid. There is also that form of complaint made in very general terms, from which it appears that the subscriber is just indulging in a little grumble when required to forward a cheque.

Whether apparently important or not, such complaints should be carefully acknowledged, *at the time the receipt is sent*, and forwarded to the relative section for treatment as expeditiously as possible in order to avoid delay and irritation to the subscriber.

As a Government Department dealing so closely and intimately with the public, it is essential that the best relationship should be maintained.

The question of withdrawal of service is approached with some diffidence, but an article of this nature would not be complete unless such an important point is mentioned. This is a delicate matter, requiring much care, but by tactful handling it is frequently possible to gain a friend instead of making an enemy. The point of view of an officer dealing with accounting matters is all-important.

The prompt collection of an account is not the only essential factor. To do so without in any way incurring displeasure or causing irritation is of equal importance.

In conclusion, to popularise the service and thus increase the calling rate is the duty and should be the motto of every officer in every section of the telephone service. Effort on the part of every branch is necessary.

The problem of the calling rate is not capable of any single solution. Our potential stock of calls is inexhaustible, with facility for speech which even at present is not confined to seas or continents and which will in the not distant future be world wide. What an asset this is to business and social life in general and yet it is not anything like fully realised.

Education in and encouragement of the telephone habit in every phase of life is necessary.

To rent a telephone and *use it* is sound advice in business or private life.

With combined enthusiasm, consistently directed to enriching the life-blood of our service by increasing the calling rate, from the telephonist whose *personality* in her work is so important, the Service Inspector who should be *missionary* as well as emissary, the Contract Officer upon whom much depends to advertise *the great facility and usefulness of the service*, to the officer of the Accounts Branch dealing with the subscriber on the vital question of money, *creating a good impression* by care, discretion and tact, then each will have done his or her best in achieving the desired end.

FOR OUR ADVERTISERS.

Contracts Open.—Melbourne Posts and Telegraphs Department. Sept. 24. Supply of Condensers (Schedule C. 461) (Reference B.X. 5488). Also for supply and delivery of switchboard instruments, test plugs, and sleeves (Ref. B.X. 5541). Latest date Oct. 15.

The above are Department of Overseas Trade references.

This same Department in a Consular report on Roumania (April 1929) gives the following information. The broadcasting station of which the construction was begun last year by a British firm is expected to be ready this summer, and an exhibition of radio apparatus is being held at the present time (August) and will be open until the end of October.

"The restrictions," says the report, "on the import and use of radio apparatus have also been removed, and British manufacturers have now an opportunity of making their goods known on a market where the demand for radio apparatus is likely to increase considerably in the future."

The Railway Authorities have ordered seven radio-telegraphic stations in France and the Postal Administration has some similar orders in view.

J. J. T.

NUMBERS.

BY T/SV5.

AND, by "Numbers," we mean of course "Telephone Numbers!" Most people have a number or combination of numbers which they regard as "lucky" and, *per contra*, many people regard the number "13" as unlucky. In the first case a not inconsiderable measure of satisfaction is afforded a subscriber if he can in any way identify his lucky number in the one allotted to his telephone circuit, and, in the second case, instances are not unknown where new subscribers, on being given numbers such as 5413—or any combination containing the fatal 13 (even if the digits total that number), have made urgent requests for the allocation of other numbers without this "undesirable" characteristic.

On a rather different plane are the requests received from subscribers for numbers which have some special significance in connexion with their businesses, e.g., the years in which their firms were established; the street number of their premises (generally taking a repeated form such as 3636); the number of "varieties" manufactured by the firm, and so on.

In pre-automatic days the most-sought-after telephone number was undoubtedly "1." Other single digits were attractive; but the first digit held pride of place. It will be recalled that this was the telephone number of several large London stores. So much importance was apparently attached to this number, that, recorded in the history of the National Telephone Co., is the case of a large universal stores which "went over" to the Post Office because the company would not force a private subscriber to relinquish his number "1" in order that it might be utilised by the stores. The Post Office at that time were in the position to offer the magic number on a P.O. exchange and thereby added a large installation to their system.

Next to the single digits, round hundreds and thousands were generally popular. On a manual exchange such numbers are quite good; although under the "Stile Strip" method of passing numbers they are perhaps at a slight disadvantage as the general rule (one two—pause—three four) takes on an exception in the case of hundreds (one—pause—hundred) and thousands (one thousand without pause).

The introduction of four-figure numbers in London was brought about by (1) the elimination of single and 5-digit numbers and (2) the prefixing of cyphers to two- and three-figure numbers. In this latter connexion it may be of interest to note that although some 40,000 subscribers' numbers were affected, only 29 letters were received by the Controller which could possibly be regarded as complaints or protests against the cypher prefix. This is typical of the wonderful readiness with which the average London subscriber is prepared to co-operate with the Post Office in the acceptance of small—but nevertheless disturbing—alterations which have as their aim the general well-being of the London Telephone Service.

The adoption of four-figure numbers for all subscribers on exchanges within ten miles of Oxford Circus has developed another magical number, viz., "1234." This was regarded by the large Stores previously mentioned as the most attractive substitute for the single digit "1." The first question a subscriber asks when he is notified that a change in his number is pending, is usually: "Can't I have a number that can be easily memorised, such as "1234"? As, obviously, only one subscriber can have the use of that number on any one exchange, pressing claimants find solace in "4321" or other sequences. The next form of number in order of appeal is perhaps the repeated digit, e.g., 3333, 4444. These numbers have, seemingly, replaced the request for round thousands; especially when it is realised that in calling these latter numbers three full swings of the dial are necessary. A form of number which attracts many people is the repetition of the first and second digits, e.g., 3434, 4343, 8181.

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It might not be inappropriate to refer here to "Numbering Schemes." The preparation of such schemes for automatic exchanges is necessitated by the need to provide for the accommodation of the four different classes of installations, viz. :—

(1) Single lines
(2) Private Branch Exchange groups of 2-10 lines.
(3) „ „ „ „ „ 11-20 „
(4) „ „ „ „ „ 21 and over lines.

In the preparation of numbering schemes two main points are kept constantly in mind. (1) The avoidance, as far as possible, of number changes when subscribers are transferred from manual to automatic exchanges, and (2) the equal distribution of traffic over the levels of the first numerical selectors.

On all automatic exchanges in London the following numbers are reserved for special services :—

0001 Monitorial group,
0099 Multi-Coin box reversed Toll calls,
0101 Service Private Branch Exchange group,
1111 Police,
2222 Fire,

and, in addition, the telephone number formed by the numerical equivalent of the 4th, 5th, 6th, and 7th letters of the exchange name.

When a manual exchange is replaced by an automatic exchange bearing the same name, e.g., Holborn, Bishopsgate, Sloane, Western, it is necessary to effect certain number changes in order to meet the requirements of the respective numbering scheme. These changes are mostly due to :—

(*a*) Large- and medium-sized groups having numbers not in the prescribed ranges for 11-20 and over 20 Private Branch Exchanges.

(*b*) Small Private Branch Exchange groups not in the appropriate ranges ; also where the final digit of the primary number ends either in "0" (4860) or is a digit which will not admit of the entire group being accommodated on one level, e.g., 4686-4692.

(*c*) Single-line subscribers in the ranges set aside for 11-20 and over 20 Private Branch Exchange groups.

It is generally necessary to carry out the above changes prior to the transfer to the automatic exchange in order to avoid flooding the "Changed Number" equipment at that exchange. To give effect to these changes frequently necessitates the adoption of "hospital" working, by means of a "paper multiple," at the manual exchange, owing to the non-availability of suitable "physical" spares. A special effort is then made to break down calls for the old numbers before the transfer to automatic working.

A point of interest in connexion with the numbering of the circuits forming the 11-20 and over 20 Private Branch Exchange groups on automatic exchanges is the utilisation of the directory number, together with a stroke and a suffix number, to identify each circuit in the group, thus : 1234/1, 1234/2, 1234/3 and so on. The individual lines are numbered in this manner at the Private Branch Exchange and faults are reported to the exchange by the Private Branch Exchange operator accordingly. The respective registers at the exchange are similarly marked.

A final word regarding "Night Service" numbers. These are non-auxiliary numbers and are associated with the main group numbers of the 11-20 and over 20 Private Branch Exchange groups in order that, during the period the Private Branch Exchange is unattended, incoming calls may be connected to particular extensions. As is well known, the operating rule, under manual conditions, is to test the number asked for and, if available, establish connexion. If the number is in the middle of a large auxiliary group the same rule applies, and this procedure permits of the utilisation of different numbers in the auxiliary group for night service. But, as is also well known, it is not possible to select a particular line in an 11-20 or over 20 group on an automatic exchange. This will be readily appreciated by the preceding description of the stroke suffix method of numbering individual circuits in these groups. The only method by which selection can take place is to tee single numbers on ordinary or 2-10 final selectors to the bank contacts of the 11-20 or over 20 unit, so that when these single numbers are called a particular line in the auxiliary group will be selected, or, if engaged, the busy tone returned.

Somebody asked the question "What's in a name ?" I know not ! But I do know that there is "heaps" in a number when it happens to be that of a telephone circuit.

REVIEWS.

"Radio Telegraphy and Telephony" by Rudolph L. Duncan (Director of Radio Institute of America) and Charles E. Drew (Instructor in Radio and in Charge of Electrical Division, Radio Institute of America). Published in this country by Messrs. Chapman & Hall, Ltd. Price 37s. 6d. net.

This book (950 pages) has been prepared as a complete text book for students of wireless communication. The first 190 pages are more or less introductory in character and deal mainly with matters not exclusive to radiotelegraphy and telephony. They are lucidly written and abound with analogies and illustrations which should help the student to steer a straight course through the intricacies of the subject. The next chapter of 100 pages deals exclusively with valves (described here as in all American publications as vacuum tubes), and is followed by Chapter XII of 120 pages about Receiving Circuits. Rectifying circuits, loud speakers, antennae, and commercial broadcast and telegraph transmitters all receive full treatment in the latter half of the book ; and, although we rather grudge the 60 odd pages occupied by spark and arc transmitters which are rapidly becoming obsolete, we realise that the authors in the present state of change were bound to make some reference to systems which may remain in use here and there for another ten years. Indeed, these chapters and some sections of the appendix seem to indicate that the book is largely intended for the use of ships' operators *in posse* and *in esse*. If that be so it may account for the fact that the authors have dealt quite inadequately with what is perhaps the most successful recent development in long-distance high-speed telegraphy, "Beam transmission," which they dismiss in 30 lines of type with the remark that "the success of beam transmission no doubt will be decided by the practical investigations now being carried on." Similarly, they have ignored altogether the Transatlantic Telephone Service, and the abstruse technical problems which have been met and overcome in connexion with the development of that commercial service. We think these omissions are to be deplored in a book bearing the imprint of Anno Domini 1929.

We notice on page 926 that water is classified amongst the oils. This is obviously a proof-reader's slip, as it would puzzle our American cousins to get "well oiled" on that commodity.

Generally speaking, the book has been written for American readers, and the Appendix furnishes much information in tabular form of the characteristics of American valves, &c., which would probably be of little use to the British public ; and the demand in this country will in our opinion be largely confined to those interested in wireless development on the other side of the Atlantic.

"International Lists of Radioelectric Stations."

As a result of the International Radiotelegraphic Conference at Washington in 1927, the International Office of the Telegraph Union at Berne has revised the list of radiotelegraph stations in consultation with the various telegraph administrations throughout the world.

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The new edition of the lists is published in five volumes, as follows :—

Vol. I.—Fixed and land stations.
Vol. II.—Stations performing special services.
Vol. III.—Ship stations.
Vol. IV.—Aircraft stations.
Vol. V.—Broadcasting stations.

Volume II comprises 7 sections, i.e. (A) Direction-finding stations, (B) Beacon stations, (C) Stations sending out time signals, (D) Stations sending out regular meteorological bulletins, (E) stations sending out notices to mariners, (F) Stations broadcasting press messages, (G) stations sending out medical advice, calibrated waves, &c.

In Volume III the names of ship stations are given in alphabetical order instead of being grouped according to countries as in previous editions. Similarly, in Volume IV aircraft stations are given in the alphabetical order of their call signs instead of being grouped by countries.

In Volume V we find the first comprehensive list of broadcasting stations, with their wavelengths, geographical positions and hours of service.

The new volumes are much handier than the old combined list and the sub-division and rearrangement of the stations makes reference to the lists much simpler.

"Aufgaben aus der Fernmeldetechnik (Telegraphen-, Fernsprech- und Funktechnik) nebst Lösungen." By K. Buttler. Published by Franz Westphal, Lübeck. Price 11.50 *Rm.*

THIS volume contains 500 Problems with Solutions in the technology of telegraph, telephone and radio communications. It is written by a teacher of wide experience, a Postdirektor in the Telegraphentechnisches Reichsamt, and one who has a clear perception of the needs of students in dealing with theoretical and practical questions relating to electrical communications. We have not before seen a book of this kind which is so well calculated to assist candidates for examinations in these subjects, not to mention the large number of students who have become interested in the science of electric signalling on account of the development of broadcasting. In this book the German reader has the advantage, but it is to be hoped that a translation will be made available for English-speaking students.

THE ST. JOHN AMBULANCE ASSOCIATION : LONDON POST OFFICE CENTRE (POST OFFICE AMBULANCE CORPS) : PRELIMINARY ANNOUNCEMENT.

CLASSES to be held in the Post Office Ambulance Centre during the coming Winter Session.

Controller's Office, Cornwall House	First Aid on Thursdays, commencing end of September. Lecturer : Dr. Hellier.
Holborn Exchange ...	First Aid, starting early in October.
G.P.O. South	Home Nursing, starting in November.
Croydon Exchange ...	Home Nursing, on Fridays in October.
Victoria Exchange ...	First Aid, first week in January.
Central Telegraph Office	Home Nursing on Thursdays, commencing for lectures on Oct. 24, at 5.30 p.m., and for practices one month previously.

We hope as many as possible will attend these courses and lectures, and so secure an efficient knowledge of Home Nursing and First Aid.

Further details will be announced later, and particulars of enrolment can be obtained from : Miss B. L. Webb, Branch Secretary L.T.S. Exchanges, Trunk Exchange, Carter Lane, E.C.4, or Miss C. M. Stephen, Cornwall House, Waterloo Road, S.E.1, or Miss A. L. Yitton, Branch Secretary Central London Telegraph Office, K. Division, St. Martin's Le Grand, E.C.1, or from Miss E. K. M. Meeser, General Secretary, Women's Section, Cornwall House, Waterloo Road, S.E.1.

PROGRESS OF THE TELEPHONE SYSTEM.

THE total number of telephone stations in the Post Office system at June 30, 1929, was 1,786,865, representing an increase of 10,995 on the total at the end of the previous month.

The number of stations at June 30 last, in London, England and Wales (excluding London), Scotland, and Northern Ireland was as follows :—

	No. of Stations at June 30, 1929.
London	638,884
England and Wales (excluding London) ...	966,538
Scotland	159,288
Northern Ireland	22,155

The growth for the month of June is summarised below :—

	London	*Provinces.*
Telephone Stations—		
Total at June 30	638,884	1,147,981
Net increase for month	4,405	6,590
Residence Rate Subscribers—		
Total	154,108	242,285
Net increase	1,261	1,836
Call Office Stations (including Kiosks)—		
Total	5,647	21,273
Net increase	21	678
Kiosks—		
Total	1,353	5,366
Net increase	30	133
Rural Party Line Stations—		
Total	—	10,548
Net increase	—	25
Rural Railway Stations connected with Exchange System—		
Total	17	1,146
Net increase	—	12

The total number of inland trunk calls dealt with during April (the latest statistics available) was 9,539,701, representing an increase of 1,050,409, or 12.4%, over the total for the corresponding month of the previous year.

Outgoing international calls in April numbered 43,002 and incoming international call 45,829, representing increases of 11,113 (34.8%) and 10,227 (28.7%) respectively over April 1928.

Further progress was made during the month of July with the development of the local exchange system. New exchanges opened included the following :—

LONDON—Beckenham, Edgware, Fulham, Maida Vale, Reliance (all automatic).

PROVINCES—Ardwell, Bridge of Cally, Cerne Abbas, Closeburn, Gamlingay, Hampden Row, Island Magee, Lumsden, Mouswald, Newbrough, Pirnmill, Welford-on-Avon (all rural automatic),

and among the more important exchanges extended were :—

PROVINCES — Cleckheaton, Henley - on - Thames, High Wycombe, Minehead, Stockport (automatic).

During the month the following additions to the main underground system were completed and brought into use :—

Port Erin—Belfast cable,

while 68 new overhead trunk circuits were completed, and 75 additional circuits were provided by means of spare wires in underground cables.

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TELEGRAPHIC MEMORABILIA.

PROBABLY our readers have long since noticed with what persistency the American press insist upon crowning Edison as the first inventor of the incandescent electric lamp, despite the very very clear evidence that the honour should be given to Swan.

The *Electrician*, in referring to the relaying of the King's Thanksgiving Service to Canada, asserts that this latter notable achievement resulted in many letters of congratulation being sent to the National Broadcasting Company of *America!*

Our esteemed contemporary fears that, "unless we are very careful, and unless we change our methods of showmanship, the credit for the Beam system, the establishment of world-wide communication by radio-telegraphy and telephony, the invention of the radio valve itself will soon be handed over to America."

It will be recalled that the service between Great Britain and Canada was so good that the service was passed on to Australia over the Canada-Australia beam and then successfully re-broadcast in Australia itself.

About the middle of last month the Wireless Correspondent of the *Daily Telegraph* wrote as follows: "I understand that protracted negotiations between the Baird Television Development Co. and the General Post Office, in connexion with experimental television hours from the B.B.C. stations, have not yet reached a definite conclusion, but it is believed that the Baird Company will be offered revised facilities consisting of about three hours a week for experimental purposes, instead of the forty-five minutes offered by the B.B.C." Up to the time of going to press there has been no indication of the acceptance of this new offer by the Baird organisation, but the offer is doubtless a sequel to the reply of Mr. Lees-Smith on July 23 regarding this matter, as recorded in *Parliamentary Questions* hereunder.

Television is making certain progress in the U.S.A. One of the scientific features of the Fourth of July celebrations in that country was the demonstration at the Bell Laboratories, West Street, N.Y. City, where the "first colour television transmission was publicly exhibited."

It is true that the actual screen was no larger than a postage stamp and the distance transmitted was limited to the length of the laboratory, but the movements of a young and gaily dressed American girl, who "acted" by waving "Old Glory" and the "Union Jack," munched a melon and showed in succession a multi-coloured ball, a pot of geraniums, a pineapple, flowers, &c., all of which, it is stated, were very effectively received in all their variety of colour and shade, although up to the present it is only possible for one person at a time to view the tiny picture.

While on these interesting developments of "still-life" and "television," it is worthy of a full quotation that *The Electrical Review* in a recent issue records the following use to which the Royal Meteorological Society has placed the Fultograph system in the expeditions of the Society into the tangled forest of the origin and nature of atmospherics:—

"An enormous amount of research into the origin and nature of atmospherics has been done in recent years by the radio research station at Slough, and the station is now to make use of an entirely novel method of recording them. The Royal Meteorological Society has arranged with the B.B.C. for special transmissions after the normal picture programmes and they will be picked up by Fultograph receivers installed for the purpose at recording stations in various parts of Europe. The transmissions will not take the form of pictures; instead there will be sent out a series of straight lines, both horizontal and vertical, forming a grid or network. When an atmospheric occurs deformation of the straight lines will take place to an extent depending upon the intensity of the interference. It is hoped that by this means it may be possible to make records which will afford valuable data for research into the intensity, duration and origin of individual atmospherics. Since the drums of all receiving apparatus, wherever situated, will be synchronised, it will be possible, by comparing the results obtained in different places, to determine the range at which an individual atmospheric can cause interference and the intensity of such interference in different localities.

Parliamentary Questions, &c.—On July 9 Viscount Wolmer asked the Postmaster-General whether he intended to carry out the policy of the late Government with regard to the sale of the Imperial cables and the leasing of the beam services.

Mr. Lees-Smith said that the contracts between the Post Office and the Imperial Communications Co. providing for the transfer of these services were signed before the present Government assumed office. Those contracts were conditional on the requisite percentage of assents being received from the shareholders. The requisite percentage had been received and the principal agreements therefore automatically became binding.

On July 8 Mr. D. G. Somerville asked the Postmaster-General if he would state the mileage and the cost per mile of underground cables already laid in this country and the annual average provision for new work of this nature; and what were the reasons for the slow replacement of overhead by underground wires.

Mr. Lees-Smith said that the total mileage of underground telephone and telegraph cables in this country was 33,500. The cost per cable mile, which depended on several factors, varied from about £500 to over £3,000. The average annual provision for new underground cable work for the next two or three years was about £4,000,000. In areas where the telephone density was high, subscribers' circuits were provided by means of underground cables throughout; in other areas poles carried and distributed the wires beyond the point where it was economical to provide underground cables, but cables were substituted for the overhead wires as soon as such a course was justified. In the aggregate, out of a total of eight million miles of wire, 6,800,000 were already underground.

On July 9 Dr. Spero asked the President of the Board of Trade whether he was aware that the increased royalties on wireless receivers had placed the wireless industry in a serious position; and whether he would make an inquiry with a view to amending legislation.

Mr. W. GRAHAM said that some representations had been received as to the effect of a recent decision of the Court on the manufacture of wireless receiving sets. As to the second part of the question, a committee was recently appointed by the Board of Trade to inquire whether any amendments in the Patents and Designs Acts were desirable.

On July 16 Mr. Lees-Smith, Postmaster-General, informed Mr. Day that there were now three radio-telephone circuits in commercial operation between Great Britain and the United States; the transmitters were concentrated at Rugby. The total number of calls passed over those circuits during the three months ended June 30 last was 3,881.

The P.M.G. also recently announced in the House of Commons that up to March 31, 1929, the beam radio-telegraph services of the Post Office had earned gross receipts of £813,100 at a cost of £538,850.

Among other matters dealt with by the Postmaster-General in the House of Commons just before it rose was a statement to the effect that it had been decided to establish a public photo-telegraphic service between London and Berlin for the transmission by telegraphy of pictures, photographs, documents and other similar matter. It was anticipated that the service would be opened in the early autumn.

Specifically, on July 23, Mr. Lees-Smith informed Major Church, on the question of the development of Television in this country, that he (the P.M.G.) "had received representations both from the Baird Television Development Company and from the British Broadcasting Corporation concerning the facilities offered for the use of a broadcasting station for experimental transmissions of television. He was considering those representations, but he was not yet in a position to state the result.

According to *World Radio*, European progress regarding broadcasting in 1928, as evidenced in the official returns collated by that journal, has shown, generally speaking, a most gratifying state of affairs. The number of actual licenceholders in Europe (excluding Russia) rose from 5,897,000 to 7,163,000.

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The actual *percentage* increase, however, is lower than in 1927, traceable to a somewhat stationary state of affairs in Czecho-Slovakia. the I.F.S., Italy and Norway, and a slight slowing up in Sweden.

The personal impression gained so far in the current year is on the whole a steady increase, as in 1928. Only in Germany has one noted any considerable decrease, which country recorded, on July 1, a falling off of no less than eleven thousand licences, up to the end of June.

There does not appear to have been any official attempt to explain this decrease, although when we read that the Berlin police have been keeping a very vigilant eye on the increase in numbers of wireless aerials, and have issued orders for their removal in several cases, we have obviously touched *one* cause, if not the complete list of causes, for the remarkable drop. A test case has been fought out in the Berlin courts, where the police contended that "a large number of aerials would produce a marked disfigurement of the city." The Court, however, decided that "only when a disfigurement already existed" could action be taken and that the police "could not act when it was merely an aesthetic probability." It will be interesting to see the figures in, say, three months' time!

In Poland, however, there has been an increase of over 13,000 during the first three months of the year, and this despite a known, but undiscovered—as yet!—number of "pirates."

By the way, in Roumania the broadcasting administration has authority not only to confiscate any unlicensed apparatus, but any person who even erects an aerial on behalf of the owner of such apparatus is punished equally with the pirate himself. The maximum penalty is a fine of £13 or imprisonment for a period not exceeding two years. In Spain, with a minimum licence fee of 8*d*. per quarter for a crystal set and just over 3*s*. for a valve installation, there, no more than in England, has it been possible to entirely eliminate the broadcasting thief.

Only in Formosa is the existence of the "pirate" unknown. According to a report from H.M. Consul at Tamsui, there are no restrictions on the use of receivers there. As the Japanese are anxious to popularise the service no fee is charged for listening in, and the Bureau of Communications is therefore able to report "no pirates"!

Personal.—The knighthood conferred on the Engineer-in-Chief, Col. Sir T. F. Purves, O.B.E., in the last New Year's Honours list for special services to the Post Office is still fresh in the memory.

To this is now added, in a more restricted sphere, his election to the presidency of the Institution of Electrical Engineers. One can be confident that the genial president-elect will grace the honoured position, no less than his many other responsible roles.

News comes of Frank Sherrard and Miss Carter, both of T.S., having been visited in The Deepings, Rutlandshire. Both Frank and his sister-in-law, it will be recalled, were on the Inland Staff, C.T.O., and both are now living in a "charming old-world cottage," so I am told. Adam Gordon is still making some slow improvement.

Things Heard.—That, a new monthly magazine is about to appear in Paris in connexion with the Posts, Telegraphs and Telephones. It will be known as *Le Relais*, and is to be issued under the auspices "of Les éditions du Torrent," a small limited liability company largely supported by the French Post Office employees.

That, Mr. Herbert, in his new book, expresses an unmistakable liking for the French Baudot brushes.

That, the American slogan, "Don't write—Telegraph," is now a popular song in the U.S.A.

The Cynic.—A cynic is a man who knows the *price* of everything and the *value* of nothing.—*Oscar Wilde.*

J. J. T.

CORRESPONDENCE.

HOW TO IMPROVE THE TELEGRAPH SERVICE.

TO THE EDITOR OF "THE TELEGRAPH AND TELEPHONE JOURNAL."

DEAR SIR,—It is perhaps safe to assume that the Department has already laid the foundation upon which to erect the telegraphs publicity machine. Let us hope so, for the organisers will admit that much ground must be covered, from John o' Groats to Land's End and the whole of Northern Ireland; so that it is not too early to set the cogwheels in motion.

The series of "How to Improve the Telegraphs" articles, have been of absorbing interest to the writer and many others, but when discoursing upon a publicity item too much attention, it would appear, has been paid to business clientele.

It will, of course, be the duty of an officer who is to take charge of an industrial, or commercial area, tactfully to convey an idea of the benefit which industry will derive from using an up-to-date service more extensively. But his job will be easy compared with that of his colleague who has been detailed to canvas in residential districts. And it is this field which as yet has not been explored by the Department, and which, the writer maintains, will contribute very largely towards saving the Telegraphs.

For a striking analogy to prove the above, we have to go no further than the huge commercial concerns, which, realising that catering for the masses is more profitable than retaining the custom of a favoured few, have adopted the instalment system for the convenience of those who cannot afford to pay "cash down."

To the business man a telegram is a necessary adjunct (our aim is to make it more so) but to a very large percentage of the social community, it is an event of such rare occurrence as to cause a considerable flutter in many households.

It is perhaps no exaggeration to say that in the matter of business it is more difficult to approach the average member of the artisan, or working classes, than that of commercial people. But that is all the more reason why we should tackle them, for are not difficulties made to be overcome? The world has no room for those who shirk the battle, for he who can cry "Victory" is a most satisfied man, and the more strenuous the fight the greater his satisfaction.

I have hinted that, to those who comprise the majority of the populace, a telegram is an unnecessary item in the social order of things, but they have relatives scattered all over the United Kingdom. To them, in many instances, compiling a letter is a laborious and thankless task, and this trait has been responsible for losing touch for many years with, perhaps, brothers or sisters or even parents. If they could only afford to send a few telegrams simply conveying the fact to those "up North" that everything is alright with those "down South," the Department would be indirectly assuming the position of social godparent, and incidentally "lining its pocket," for the result would be an overwhelming increase in traffic.

But this will never happen whilst the proletariat (horrible word!) have no alternative from "twelve words a shilling." Would it not be worth while to do as some have already suggested and inaugurate a deferred inland rate with the proviso of certain conditions?

Just about a century ago, James Morrison was employed as an errand lad in a Fore Street warehouse. By the time he had reached middle age he possessed a fortune so large that after all expenses had been deducted for the upkeep of the huge business which he now controlled, an enormous surplus was left which was put to many and varied uses, including the purchase of ample demesnes. Mr. Morrison died in October, 1857, leaving behind a matter of over four millions, and the secret of his success lay in the fact that he was one of the earliest among mercantile men to realise that small profits bring quick returns, placing his merchandise within *everybody's* reach, he reaped the benefit. If it is proposed to institute a house-to-house canvas in residential districts, the question as to time and day must be given very careful consideration. A publicity officer, or canvasser, will anticipate anything but a standard duty if he is out to make things "go." A knowledge of human nature will be of great value, and the necessity for excluding official atmosphere will soon be made more apparent here than in an industrial centre.

One must be very careful not to leave an impression with these people that they have been conversing with a very important public official who may feel a slight increase in the size of his head at being called "Sir," as is very probable in these circumstances. Rather should he gain their approval by adopting an attitude of a genial and unassuming nature.

Mr. Archibald is dubious about any increase in social traffic; but I most respectfully submit my very humble opinion that attractive features and publicity among the masses may entice *all* classes to make such use of the telegraphs as to reverse the trend of events, and make the system a serious competitor to that of the Telephone—or, at least, place the two services on a par.

If the mountain won't come to Mahomet . . . !

W. T. L. (*C.T.O.*).

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C.T.O. NOTES.

Promotions.

MR. G. T. ARCHIBALD, Traffic Section, Secretary's Office to Assistant Controller; Messrs. F. Sparks, W. A. Lock, Assistant Superintendents to Superintendents (Lower Grade). Messrs. G. H. Baker and T. H. Wright, Overseers to Assistant Superintendents; Misses G. E. Sutton, M. Veats, M. W. Lambert and E. A. T. Targett, Telephonists to Assistant Supervisors, Class II Telephones.

Retirements.

Messrs. E. Cooper (Assistant Controller), H. Almond (Higher Clerical Officer), J. Rees and A. E. Bowden (Superintendents, Lower Grade), P. Diggins and L. S. Page (Assistant Superintendents), F. R. Foster, W. H. Lane, M. S. Jackson and S. H. Townsend (Overseers), W. A. Cox, F. W. Martin, S. E. Barrett, H. W. Bastable, E. G. C. Reay, W. S. Roberts and C. J. Nelson (Telegraphists); Misses M. McLaren and L. E. F. Carr (Supervisors), A. M. Messeder and R. A. Battersby (Telegraphists).

Obituary.

We regret to learn of the death of Mr. H. E. Cullum who only retired from the post of Superintendent in April last. It is understood that Mr. Cullum had just finished a game of bowls when he collapsed and died. To his widow we extend our sincere sympathy.

C.T.O. Veterans.

The Summer re-union of the C.T.O. Veterans was favoured with delightful weather for their river trip to Hampton Court and back to Richmond. All thoroughly enjoyed themselves and are looking forward to the announcement of the completion of arrangements for some form of re-union during the Autumn.

Sports.

The C.T.O. Sports and Garden Party held a successful meeting at Chiswick back in July. Glorious weather prevailed and the races, together with some attractive side-shows and dancing to the music of Leonard Coombs Orchestra, helped the company present to pass an enjoyable time. Mrs. Stuart Jones, who presented the prizes, was supported by Mr. Stuart Jones; Mr. D. M. Ford and Mr. A. Faull, and we were pleased to see Mr. J. Y. Bell and Mr. L. Simon from the Secretary's Office in attendance. The London Telephone Service won the Ladies' Invitation Race. The Mile Championship is now held by Mr. Sowden, Cable Room, Mr. A. Pritchard of the "D" Division won the 100 Yards Handicap, Miss M. Badderley, Central Hall, winning a similar race for the ladies.

The Cable Room also have held a very successful Sports Meeting at Chiswick recently and Mrs. Stuart Jones presented the prizes. Mr. Sowden won the One Mile Handicap.

Cricket.

The Centels beat the Secretary's Office on July 11. Scores: Centels 179 for 3; Secretary's Office 60. On July 25 the Centels won the game with the W.C.D.O. Scores: Centels 161 for 8; W.C.D.O. 128.

Flower Show.

The C.T.O. Amateur Gardening Association held a successful Rose Show recently. In addition, occasion was taken to have the Annual Floral Gift Day, and the numerous bunches of flowers were divided between the London and Garrett Anderson Hospitals. A collection resulted in £1 10s. being forwarded to the latter for the supply of flowers for the C.T.O. bed. Mr. E. J. Piercey was the most successful exhibitor.

OBITUARY.

MR. A. A. PARSONS, STORES DEPARTMENT.

THE unexpected death of Ambrose Parsons, three years before the time at which in normal course he would have retired, has robbed the service prematurely of a conspicuous figure. There are many men who command the respect of their colleagues for the qualities which make for efficiency of the harder sort, there are many who gain esteem for their character, but there are not many of whom it can be said that they have won the love of those with whom they have mixed in the official world. Ambrose Parsons was one of these few. His was a personality of singular charm and graciousness, which found expression in a remarkable way in his dealing with men and affairs even in the unromantic business of the Stores Department of the Post Office. He never failed to look upon those with whom he worked, particularly his juniors, as men and women first, and cogs in a big machine only secondly. In all the non-official activities which grow out of the life of a big Department he took a great interest, and one of his congenial functions was to represent the Stores Department on the Committee of the Post Office Clerks' Benevolent Fund.

Outside the official world he had very active literary and artistic interests and he will be missed by a wide circle of friends. A little quixotic and unconventional, but essentially sane and large-minded, he attracted and held the regard of some of the leaders of the intellectual and social life of our time, and with his gentle and tolerant spirit, was a link between them. The funeral service on Aug. 7 at the old Parish Church, Chiswick, under the shadow of which, on the Mall, he had lived for many years, was attended by a large number of mourners, and from his own Department there came the Controller, the Vice-Controller, and representatives of all grades.

DEATH OF MR. S. O. ALLEN.

THE Post Office Telephone Service has suffered a severe loss by the death of Mr. S. O. Allen, late District Manager of the North-Western District, which took place in a Liverpool nursing home on Wednesday, June 19.

Mr. Allen's devotion and loyalty to the service were tempered by a pleasing personality and genial disposition which endeared him to his colleagues and the staff who served under him, and his death at the comparatively early age of 51 has left all who know him with a deep sense of personal loss.

Prior to his appointment as District Manager of the North-Western District in January, 1926, Mr. Allen's official career was spent mainly in Birmingham and Southampton, but his work as one of the executive of the Traffic Officers' Association for many years was known and appreciated by telephone traffic men throughout the country.

The funeral took place at Birmingham, on Saturday, June 22, and in addition to the family, relatives and personal friends, there were also present Mr. R. Morgan, Traffic Superintendent (representing the Surveyor and Telephone Staff of the North-Western District), Mr. P. Currall (District Manager, Birmingham), Mr. A. L. Barclay (District Manager, Chester), Mr. C. W. Piggott (Traffic Superintendent, Birmingham), and Mr. J. Henson (late Postmaster of Lancaster). An unusually large number of beautiful floral tributes were forwarded, including wreaths from the Surveyor and Assistant Surveyors, North-Western District, Staff of the North-Western Telephone District, Preston, Superintending Engineer and Staff, Preston, many Head Postmasters, District Managers, District Office and Traffic Staffs, with whom Mr. Allen had been associated, colleagues of the Secretary's Office, G.P.O., London, Telephone Traffic Officers' Association, and the Federation of Post Office Supervising Officers.

In the following note of appreciation Mr. A. E. Coombs expresses the feelings of all whose privilege it was to know Mr. Allen.

"S. O. Allen was one of that limited band of practical idealists with which humankind is blessed. He was, moreover, guide, counsellor and friend to his co-workers in the service, and was ever ready to help and encourage his fellow officers. To many of the recruits to the ranks of the Provincial Traffic Staff he may be known more by repute than by personal acquaintance, but that does not alter the fact that he did much for them, and for the rest of his colleagues during the past decade. From 1916 onwards to his promotion to the District Managers' grade in 1926, he was an active member of the Traffic Officers' Association and was responsible, with his fellow executive members, for the splendid pioneer work which was carried out during that period, the results of which are seen and appreciated to-day and therefore need no eulogising here. It can be said with truth that our departed colleague 'spent himself doing good,' and that his death will create a gap, and leave a wound that time alone will lessen and soften.

"In addition to his official and 'associational' activities, Mr. Allen was possessed of a charming personality which made and kept many friendships. To be counted his friend was to be brought in a circle within which it was a privilege and honour to move. Truly that part of the world in which he moved, lived, and had his being is very much the poorer by his loss."

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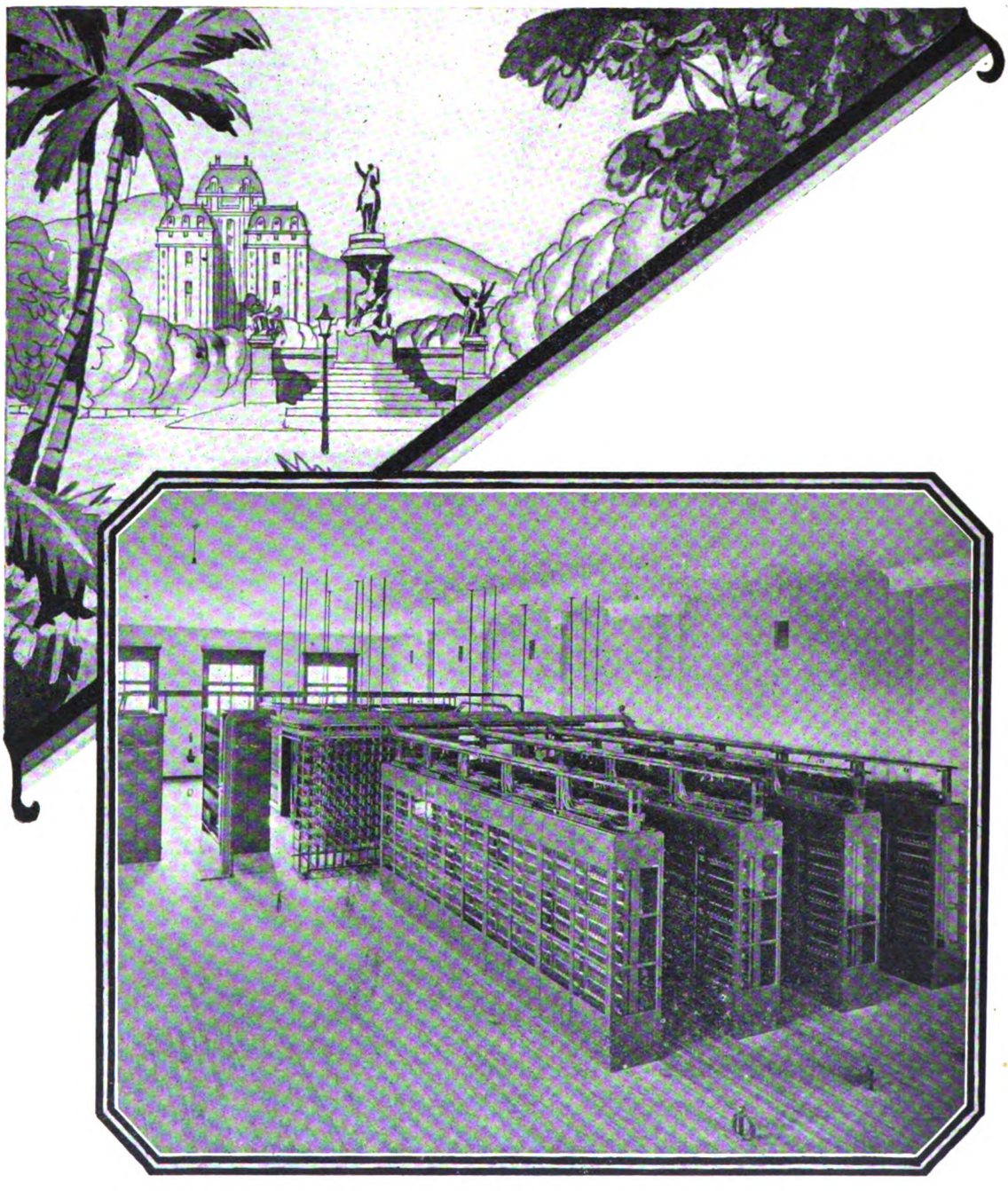

A view of the Barracas Office in Buenos Aires showing some of the Strowger Automatic telephone equipment. Since this picture was taken, substantial additions of automatic equipment have been installed in this office, due to increased demands for service in its area.

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STROWGER

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ɔs Aires Makes Rapid Strides
ı Telephone Development

e United River Plate Telephone Company introduced the first Strowger
ic telephone equipment into the Buenos Aires network. The decision to
convert this premier city of South America to Strowger Automatic
made only after the company's highly successful experience with this
cities of Cordoba and Rosario during a six year period prior to 1919.

ıere are more than 75,000 Strowger Automatic Telephones
in the city of Buenos Aires serviced through fourteen
ices. These comprise about 75% of the total number of
ıtions in the city, with additional offices scheduled for
an early date. The excellent reputation which Buenos
ıs having one of the finest telephone systems in the
ıo small measure due to its early adoption and
e of Strowger Automatic equipment.

tic Electric Inc.

er Dial Telephone and Signaling Systems
033 West Van Buren Street, Chicago, U. S. A.
ce Offices in All Principal Cities

ORT DISTRIBUTORS
Automatic Telephones, Ltd., Sydney
Independent Sales and Engineering Co., Ltd., Vancouve.
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CIATED COMPANIES
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npany, Ltd. Liverpool
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AUTOMATIC

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The
Telegraph and Telephone Journal.

PUBLISHED MONTHLY IN THE INTERESTS OF THE TELEGRAPH AND TELEPHONE SERVICE, UNDER THE PATRONAGE OF THE POSTMASTER-GENERAL.

Editing and Organising Committee - - - Lieut.-Col. A. A. JAYNE. J. STUART JONES. W. D. SHARP. J. F. STIRLING. J. W. WISSENDEN.

Managing Editor - - W. H. GUNSTON.

NOTICES.

As the object of the JOURNAL is the interchange of information on all subjects affecting the Telegraph and Telephone Service, the Managing Editor will be glad to consider contributions, and all communications together with photographs, diagrams, or other illustrations, should be addressed to him at the G.P.O. North, London, E.C.1. The Managing Editor will not be responsible for any manuscripts which he finds himself unable to use, but he will take the utmost care to return such manuscripts as promptly as possible. Photographs illustrating accepted articles will be returned if desired.

VOL. XV. SEPTEMBER, 1929. No. 174.

A YEAR OF JUBILEE.

IN August, 1879, some nineteen months after the first public telephone exchange in the world had been opened at New Haven, Connecticut, the first telephone exchange in Europe was working at Coleman Street, London, with about a dozen subscribers. In the September of the same year exchanges were opened at Faulkner Street, Manchester, and Lombard Street, London, and in October in Liverpool and Edinburgh. In each case these exchanges started with eight to twelve subscribers, and in most cases they had increased to several hundreds by the end of the year. Exchanges at Birmingham, Sheffield, Glasgow and Bristol were also opened late in 1879. These dates, we believe, are as accurate as the most careful investigation can render them. Old readers of this *Journal* will remember that we have had much correspondence on the subject of the first exchange in Europe. The honour has been variously claimed by Manchester, by the Edison Company's exchange in Lombard Street, London, the Coleman Street Exchange above mentioned, and by a system established by Mr. David Graham in Glasgow, which was probably a private wire system. As the Telephone Company of London (with which the Edison Company subsequently became amalgamated as the "United Telephone Company"), held the Bell patents, there is every probability that they were in a position to open an exchange earlier than their sub-licensees, and the opinion that Coleman Street was the first exchange established in this country is held by the principal surviving telephone pioneers who remember its existence in the August of 1879. The evidence of the *Manchester City News*, of Sept. 13, 1879, "a telephone exchange is *about* to be opened in Faulkner Street" is pretty conclusive of this contention.

What has done much to complicate a simple question is the confusion by historians and paragraphists of the date of the formation of a telephone company (which usually at once proceeded to deal in private lines) with the construction and opening of an exchange—a vastly different matter. For example, the *Daily Mail*, in a recent article on "50 years of Telephones," after referring to the Coleman Street Exchange, says: "But Liverpool had an exchange earlier, in a barn-like building, in which sat the first 'hello' girl." The Lancashire Telephone Company was certainly formed in Liverpool in August, 1879; but the first exchange in that city was not opened until the October of that year, nor did, we think, the first "hello" girl sit at it. The earliest exchanges, as our readers know, were operated by boys and the employment of girl operators was not *universal* until 1889. They were, however, well-established in Liverpool and London by 1883 and 1884, as is evidenced by pictures in the *Graphic* and *Electrical Review* of young ladies in "bustles" seated at the switchboards of those cities.

Whatever points may be in dispute, it is certain that 50 years ago in September 1879 there were exchanges in existence in London and Manchester with less than 50 subscribers between them, and that within 18 months of its inception the London telephone system had increased to 8 exchanges with about 1,000 subscribers' lines. The 50th anniversary of the system is, we think, worthy of a modest commemoration in this paper. The small bodies of subscribers who could to their astonishment and delight converse satisfactorily with the dozen subscribers joined up to their exchange have grown to some 1,845,000, who can communicate not only with one another but with about 90% of the telephone stations in the world. Familiarity with the achievements of 50 years of telephone progress has perhaps blunted our sense of the marvellous, but some of the recent developments of the art have certainly gone far to put a fresh edge upon it.

HIC ET UBIQUE.

THE series of articles on "How to Improve the Telegraph Service" has provoked much discussion, as we hoped that it would, and we are pleased to publish in this and the succeeding number of the *Journal* supplementary and unsolicited articles on the same subject from two officers of the British telegraph service and from one of our foreign colleagues. But the series as planned ended with our last number; and it is appropriate, therefore, in the present number to review the whole series. Mr. Simon, Assistant Secretary in charge of the Inland Telegraph Branch, has been kind enough to undertake the task in an article which he modestly calls a "postscript." Mr. Simon congratulates the *Journal* on the series; we pass on these congratulations to our contributors, to whom the praise belongs. The articles clearly show that the telegraph service, though it has little cause for complacency, has every reason for hope.

Further extensions of the overseas telephone services took place in August. The Anglo-Finnish service was extended as between

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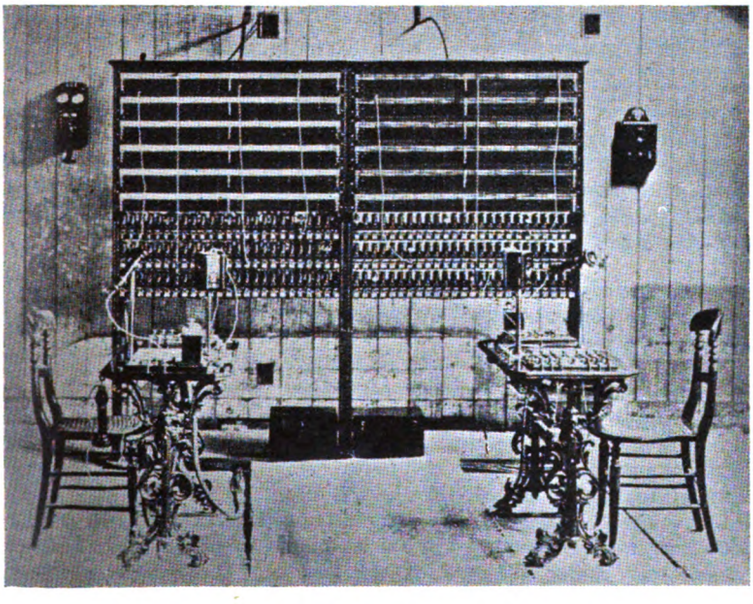
London and the fourth Finnish zone on the 22nd. On the 26th the transatlantic service was extended to the Isle of Man, Belfast, and Dublin; and on the 28th Italy (Milan only for the present) was admitted to the transatlantic service.

We have received a copy of *A.T.I.* (*Annuaire Téléphonique International*) published in Copenhagen. This enterprising work is a European telephone directory classified according to trades. The introductory matter (information concerning European and transatlantic telephone services, &c.) and the headings are in English, French, and German. The book includes an extremely useful list of charges from practically anywhere to anywhere else in Europe (that is, of course, between places in telephonic communication with one another). It is well printed and produced.

Another foreign publication for which we have nothing but praise, is the *Länderkarten des Europäischen Fernsprechnetzes*, published by Verlag Europäischer Fernsprechdienst, Berlin. This is an atlas containing maps of the trunk telephone system of every country in Europe, showing all the cable routes completed or planned, brought up to the May of this year. It is invaluable to all interested in inter-European telephony and costs only 2 marks.

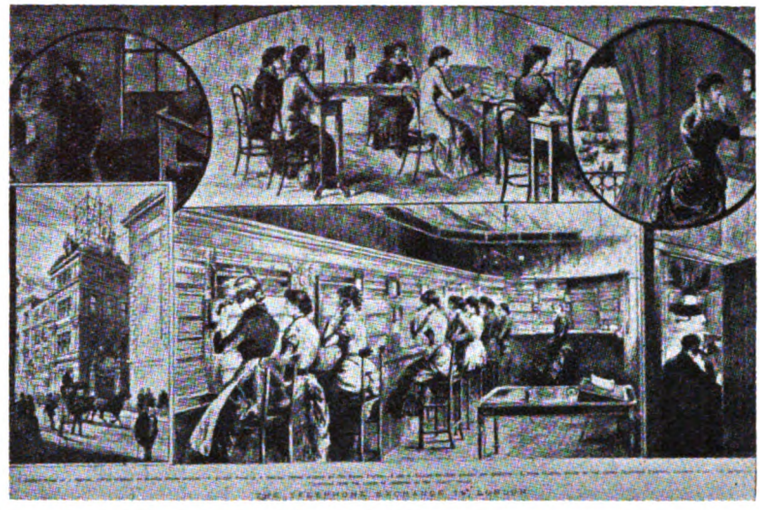
The fiftieth anniversary of the opening of the first European telephone exchange has given rise to much discussion in the press and has called forth many opinions and reminiscences from early subscribers. The quotation from the *Manchester City News*, to which we refer in our editorial, seems to settle Manchester's claim, and Mr. Bennett's letters and quotation from the *Electrician*, 1879, contained in our June and September (1925) issues effectively disposed of Glasgow's. There is still a little obscurity about the



THE EXCHANGE AT 36, COLEMAN STREET, LONDON, 1879.

priority of the Coleman Street and Lombard Street exchanges in London. The late Mr. T. Fletcher, and Mr. C. J. Phillips (happily still alive), who were both chief engineers of early telephone companies, and who should be in a position to know, were certain that the former was working in August, 1879. The latter was officially opened in September, and in his work on "The Telephone," Mr. J. E. Kingsbury gives the following list of first subscribers: (1) Messrs. Parrish, (2) Pullman Car Association, (3) Messrs. Renshaw, (4) Col. Gourand, (5) Equitable Insurance Co., (6) Messrs. Waterhouse, (7) The Edison Telephone Co., (8) Messrs. Kingsbury, (9) Messrs. Anderson, (10) *The Times*.

The Times on Sept. 6 1879 remarked "that telephonic communication has at length become an accomplished fact in the City of London," and says elsewhere, "there are ten favoured spots



TWO LONDON EXCHANGES IN 1883 (FROM "THE GRAPHIC"), SHOWING GIRL OPERATORS AT WORK. BY THIS TIME THERE WERE AT LEAST 15 EXCHANGES IN LONDON and 3,195 SUBSCRIBERS.

at which this privilege can be obtained" (i.e. those just mentioned). This looks as though *The Times* was not aware of the eight or so subscribers' lines working on the Coleman Street Exchange; and it seems probable in the case of those early exchanges that the companies did not give publicity in the press to their opening with a mere handful of subscribers, but waited until they had a respectable number of lines working. In fact these exchanges were never born, but like Topsy they just "growed." Mr. Kingsbury is of opinion, for instance, that Lombard Street was working before its official opening with 10 subscribers on Sept. 6. The Telephone Co. (the Coleman Street firm) had about 200 subscribers by Dec. 24, 1879, and the Edison Co. (Lombard Street, afterwards Queen Victoria Street) 172 by the following February, when each company had 3 exchanges working.

Mr. Baldwin, in his comprehensive "History of the Telephone in the United Kingdom," gives the names of those "among the first" subscribers on the Coleman Street Exchange: (1) Harvey, Brand & Co., (2) W. C. Quilter, (3) J. S. Forbes (L.C.D. Rly.), (4) Croll (Wool Exchange), (5) G. Chubb & Sons, (6) Saml. Dobree & Sons, (7) Marine Ins. Co., (8) G. & R. Dewhurst, (9) Ashurst, Morris & Co., (10) Dent Bros. & Co., (11) Quilter, Ball & Co., (12) Smith, Payne & Smith, (13) Emile Erlanger & Co. It will be seen that the traditional number of 8 has grown to 13; but it is evident that the foregoing were not all "original" subscribers. Mr. G. Chubb, for example, after writing to *The Times* on Aug. 19, asking when London would get a telephone service, wrote again on the 21st saying he was pleased to find that one company had "got it at work," and thanking the officials of the Telephone Co., Ltd., for showing him the arrangements.

In the various reminiscences recorded in the press there is a tendency to confuse private lines, which were developed much earlier, with exchange lines. The Telephone Co., Ltd., was registered in June, 1878 and installed numerous private lines before it opened its first exchange. One subscriber remembers talking from London to Brighton in 1881, although the London—Brighton trunk was not actually opened until the end of 1884. Such is the material from which the historian of the telephone has to glean his scanty evidence.

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THE TELEGRAPH SERVICE.

I.—By an Engineering Officer.

[The following is the first of two supplementary articles received on the subject "How to Improve the Telegraph Service." The Editing Committee accepts no responsibility for the views expressed in this series of articles.]

An attempt by a minor grade man, engaged in a restricted sphere of work, to state a case for "The Improvement of the Telegraph Service" must of necessity be limited, and will in all probability be made with a degree of bias.

From experiences gained over a number of years in the Central Telegraph Office certain definite conclusions may be arrived at. The first and foremost which, in the writer's opinion, has proved detrimental to the best interests of the service is the indefinite method of control which exists where two or more sections of the service are involved. Whilst fully appreciating the difficulties to be surmounted there appears to be an urgent necessity for complete control under one head. The present arrangement does not foster that co-ordination so necessary to an important public service. Border-line duties must necessarily exist under any telegraph system; it should be an essential, however, where duties of an engineering nature are apparent, that only officers fully trained in that particular branch of the work should be employed upon them.

For some considerable time the alleged instability of apparatus has been a byword in most large offices. This, it would seem, is more attributable to method of control than to actual instability. The line of demarcation being such a fine one, it is difficult to determine where one duty ceases and the other begins. Experience has proved that apparatus placed under the care of an efficient mechanic and maintained solely by him gives a far greater standard of efficiency than apparatus which is at the mercy of the many and varied to do their best or worst upon as the case may be. Therefore, under efficiently trained maintenance engineers, considerable time and expense could be usefully saved by the rapid detection of the causes of trouble. To ensure that this class should be an economic grade, a commercial and manipulative training would be necessary, but only as a secondary and not as a primary training. In conclusion on these points: A Controller of Telegraphs, with traffic and engineering assistants responsible to him for their respective sections, would be in possession of a more efficient machine than is available at present. Of any utility service, it has become common public practice to look upon everything connected with it from two standards, i.e., bad and indifferent, and unless due care is taken this practice will develop inside the service as well as out.

As a matter of fact, in most things telegraphic there is a quality and stability which, if used in the correct way, would be difficult to equal in any branch of the outside commercial world. The failing appears to be in not carrying out a definite line of policy. The workmanship and quality used in the construction of telegraph apparatus is second to none, although it should be borne in mind that there is a vast difference between constructional adjustment and practical working adjustment. Much delay could be avoided by the appointment of highly specialised maintenance men to perform this class of work under traffic conditions. The policy of converting out-of-date apparatus to modern design is to be deplored—it is without doubt false economy. The usage of so many different types of apparatus throughout the service is indicative of the indecisive methods applied: both from a manipulative and maintenance standpoint it is bad. During recent years an attempt has been made to stabilise universally the Booth-Wilmot keyboard for general use on busy circuits. The chief grievance, from a manipulative point of view, is the unequal resistance of the keys. Although this may to some extent be eliminated, it cannot, with the present design, be entirely avoided. The only available alternative is to fit the operator to the machine and allow him or her to become thoroughly acquainted with its peculiarities. A competent typist has difficulty working on a strange typewriter, the keys of which, in contrast to the perforator, are of almost equal resistance; therefore it would seem that the constant change of operator is not sound. An analysis of the foregoing indicates that a definite policy on the selection and construction of apparatus is required, a thoroughly reliable test of apparatus by specialists under traffic conditions, and a method of allocating traffic points to the same individuals.

Maintenance.

The practice adopted in most of the larger offices for dealing with faulty apparatus leaves much to be desired. The diagnosis is not arrived at quickly enough, with consequent delay of advice to the maintenance staff. The remedy for this has already been suggested.

There is an insufficient means of proving and testing faulty apparatus, and the question of spares needs serious consideration. The present workshop system of maintenance exchange, involving so much transportation and unnecessary waste of time for minor repairs and overhauls, should be abolished. A modern workshop sufficiently large to accommodate the necessary staff is required, geographically situated to ensure immediate replacement of faulty apparatus. A systematic overhaul of apparatus would ensure greater efficiency than running it to a standstill. Greater care and attention should be paid to the training of maintenance staff. The departmental policy requiring skilled men to acquire knowledge of so many branches of work is unfair both to the men and to the department.

Advertisement.

During recent months large numbers of engineering employees have been discharged. It would be well to attempt to carry out the Government policy in alleviating unemployment by engaging some of these men on the erection of advertising signs, electric and otherwise, in various parts of the country.

Imagine the commercial value of an electric sign along the front of the Central Telegraph Office, and similarly at other large and small offices.

There is adequate talent and ability inside the service for the formation of an advertising section, which would, incidentally, absorb some of the redundant staff of the manipulative grade. "Advertising pays," so why delay this all-important branch. Phonograms, being an arm of the telegraph, should be made more widely known. The collar of the telephone transmitter in all public call boxes could be put to good use as an advertising medium placed immediately under the eye of the public. Private subscribers' 'phones could also be used where no objection is raised. Many and varied are the facilities for advertising, which, of course, must be common knowledge.

Finance.

Of the wider issues involved, no attempt will be made by the writer; finance, although not entirely outside the normal ken, is intricate enough to make one wary. Sufficient is it that the amount taken weekly by any employee in the telegraph service is not so unnecessary or over-abundant to cause an absence of interest in the welfare of that service.

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TELEPHONE DEVELOPMENT STUDIES.

BY W. R. BURGESS AND A. R. LEWIS (*Manchester*).

IN the May 1928 issue of the *Telegraph and Telephone Journal* there was published a very interesting account, in the form of a paper by Mr. Maclure, of the Evolution and Practice of Telephone Development Studies. The present writers, who have been engaged for over a year in the clerical work of development studies, that is, in the translation of the material gathered by Field Officers into the form necessary for presentation to Headquarters for criticism and approval, desire to offer a few observations on the clerical side of the work.

The Block Survey.—A brief outline should perhaps first be given of the method by which the telephone requirements of an Exchange area are forecasted. Mr. Maclure has explained how the Field Officer, armed with six-inch map, service instructions, and note-book, surveys the area, makes judicious enquiries, and by means of an intelligent use of his imagination, restrained and fortified by knowledge of service instructions and past experience, records in his note-book particulars of the various classes of property (known as tenancies) existing in the area, and of the changes which he considers will occur during the course of the next 6, 11, and 21 years.

An Exchange area is divided into D.P. areas, i.e. small blocks of a size suitable for being served from a distributing pole. A small Exchange area may contain 20 D.P.s and a large one as many as 2,000. These blocks are numbered serially on the maps carried by the Field Officer, who surveys each block separately and enters in his note-book complete particulars of the tenancies existing and anticipated. At the end of the field work the note-book contains information on the following lines :—

Block No. 101.

Classification Code.	*Existing Tenancies.*	*Tenancies anticipated at*			*Notes.*
		6 years.	*11 years.*	*21 years.*	
O3	1	2	3	4	
O4	2	2	2	2	
S3	3	3	3	3	
S4	4	4	4	4	
R4	6	12	12	12	
R5	50	45	40	40	
S2	—	—	1	2	

Then follows the clerical work. The particulars are extracted from the note-books on to summary forms (C.M. 40) so that the separate items of each class of tenancy are collected from the many D.P. blocks and brought to one total for the whole of the Exchange area. A separate set of forms is required for the summarising of each of the four columns (Existing, 6, 11, and 21 years' tenancies) shown in the example. Multiplying factors, representing the anticipated telephone value of each class of tenancy, are applied to the various totals in each class, both in respect of each D.P. area and of the Exchange area as a whole, so that on completion the Summary forms show :—

1st Set.—Number of Existing Tenancies of each class, and total number of Lines of all classes (in one total) for each D.P. area and for the whole of the Exchange area.

2nd Set.—Number of Tenancies of each class, and number of Lines of all classes, anticipated at 6 years in each D.P. area and in Exchange area as a whole.

3rd Set.—Similar to 2nd Set at 11 years.

4th Set.—Similar to 2nd Set at 21 years.

Such, in brief, is the method of the Block Survey. Can it be said that finality has been reached, or is the system capable of improvement. So far as the Field Officer's part is concerned, the system would appear to be sound. Various unforeseen events could occur to mar his findings. A new industry might arise suddenly or an old one disappear. The recent action of the Manchester Corporation in passing plans for a 17-storey skyscraper may herald a movement which will involve a new development study of Manchester in the not distant future. Such happenings, however, are well provided for in existing instructions. All Contract Officers are required to bring under notice any town-planning scheme, estate development or abnormal building development which they may observe in their canvassing duties ; and every block survey forecast has to be reviewed quinquenially. But so far as the clerical work is concerned, it is the opinion of the writers that very great improvements can be effected.

Existing Telephone Value.—Assuming the field work to be done efficiently, the most important link in the development study is the multiplying factor, and the foundation for sound multiplying factors is the actual existing telephone value of the various classes of tenancy in the area under survey. But no provision is made, in the standard method* of carrying out a development study, for ascertaining and furnishing to Headquarters the existing telephone value of the various classes of property. This shortcoming has been remedied at Manchester by the following method :—

In the Field Officer's note-book an additional column is ruled for indicating the existing lines against each entry of existing tenancies, and when the latter are extracted on to the summary forms, the relative lines are extracted at the same time (by using divided columns). From the resulting totals the actual existing telephone value of each class of tenancy in the Exchange area is obtained.

Summarising Tenancies and Calculating Anticipated Lines.—The method of summarising the tenancies existing and anticipated, and of calculating the resulting lines has also been modified in practice at Manchester with the result that an enormous saving has been effected in the number of forms C.M. 40 used, and in the time required for achieving the desired result. So great is the difference in this method compared with the standard system that in one study, a block survey of the Manchester City and Central area, the number of forms C.M. 40 required was 17 instead of 700, a saving of 97%. In a small study of, say, 150 D.P. areas the number of forms C.M. 40 required would be reduced from 68 to 7. This result is achieved as follows : The summary forms are used for collecting the items from the note-books and bringing them to totals for each class of tenancy in the Exchange area, but not for working out the details of each D.P. area. The latter operation is more easily and concisely worked out in the note-books by providing extra columns, as shown below.

This alteration obviates the necessity of using a separate line on the form C.M. 40 for each D.P. area, and the columns of the form may now be filled with as many figures as they will hold. It is usually found that one form will suffice for the extraction and summarising of the whole of the particulars concerning existing tenancies and lines contained in a full note-book. When the totals of existing tenancies have been obtained the figures are carried to the top of a fresh form, C.M. 40, and the tenancies anticipated at 6 years are found simply by the addition and subtraction of new buildings and demolitions. Where there is no change in column (3) compared with column (2) the figures are ignored. (In the standard method every figure must be extracted and every D.P. area given a separate line on the Summary form.) In a similar manner the tenancies anticipated at 11 years are found by carrying the 6-year totals to a fresh form, C.M. 40, and adding or subtracting the differences between columns (3) and (4). Finally, the tenancies anticipated at 21 years are obtained from the 11 years totals by a similar operation.

Avoiding Duplication in Note-Books.—Following on the adoption of the foregoing reform a method was devised of making the extraction of the figures relative to the 6, 11 and 21 years periods much simpler. Instead of filling in each of the columns (1) to (6) in his note-book (see examples) a Field Officer is required no longer to utilise columns (3), (4) and (5), except for new buildings and demolitions. It had been found that in the vast majority of cases the figure for Existing Tenancies, also for those at 6, 11 and 21 years, was the same. To repeat the same figure in the four columns is not only an unnecessary duplication of work on the part of the Field Officer, but it makes the extraction of the figures much more difficult. It is the differences which are required, and if there is no difference then the presence of a figure is merely confusing. Liability to error is reduced because every figure now inserted has to be taken into account, so that instead of being mixed up in a mass of figures they stand out conspicuously. Time is saved because, instead of every line bearing a figure and having to be scrutinised, only a fraction of the lines now contain figures. In applying the multiplying factors, of course, the Existing Tenancy figure is used for all the periods if no subsequent figure appears in the following columns.

Block No......

Street, &c.	*Classfn. Code.*	*Existing Tenancies.*	*Tenancies anticipated at*			*Existing Lines.*	*Lines anticipated at*		
			6 years.	*11 years.*	*21 years.*		*6 years.*	*11 years.*	*21 years.*
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)

* The standard instructions are under review (Ed. *T. & T. J.*).

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Furnishing Result to Headquarters.—The next modification of the standard system occurs in furnishing the result of a block survey to Headquarters. In this connexion the following forms are required: C.M. 20 (classification of tenancies, with the multiplying factors adjudged to each class of tenancy for each of the forecast periods); C.M. 40 (containing a summary of the various classes of tenancies at each of the forecast periods) and C.M. 31 (showing past actual growth of lines, future anticipated lines at various dates, population, &c). Under the Manchester System the information contained in forms C.M. 20 and 40 is presented on a more comprehensive typed form which gives, in addition, the existing lines relative to the existing tenancies, and the existing telephone value of every class of tenancy in the Exchange area. As the next columns of the typed form show the multiplying factors used to forecast the anticipated lines, it can be seen at a glance what basis exists for the factors decided on.

New Comprehensive Form C.M. 31.—It is considered that it would be an advantage if the whole of the information required by Headquarters were embodied in one form, and a specimen form combining the present forms C.M. 20, 40, 31, and the additional information given in the typed form referred to above, has been submitted.

Population.—The calculation of population figures offers some difficulty, as Exchange areas rarely coincide with the administrative boundaries for which population figures are given in the Census returns. The most reliable method appears to be that of multiplying the "occupied tenancies" by the "occupancy value." The latter figure is obtained by taking from the Census returns the population and the separate dwellings of the administrative areas comprising the bulk of the Exchange area and finding the ratio. The figure obtained is, of course, for 1921, since which time some improvement has been made in the housing situation, and our ratio will generally need some slight modification. Then with regard to the population in 21 years' time, it seems safe to assume that all housing shortage will have been met, in which case the number of persons per house will be further reduced. Factors such as the influence of birth control, the general tendency towards the decrease in the number of persons per family, &c., are ignored. Their effect in the past is, of course, embodied in the ratio obtained from the Census returns. Considerable divergency has been found to exist between various areas, ranging from an occupancy value of 5 in a mining district to 3.78 in a district partly covered by farms.

Schedule of Telephone Values.—A very interesting outcome of the adoption of the foregoing modifications has been the compilation of a schedule giving the following particulars respecting each Exchange area recently studied:—

(1) Number of Existing Tenancies of each class.
(2) " " " Lines " " "
(3) Telephone value per tenancy " " "
(4) Population.
(5) Information similar to (1), (2), (3), (4) for the combined exchanges.

This schedule enables a Contract Manager to see at a glance whether any particular class of tenancy in an Exchange area is showing an average return in telephone development. If there is a considerable lag and no known reason exists to account for the deficiency there would appear to be a case for an intensive canvassing campaign in that particular class with some likelihood of success.

The ratio of doctors to population, of shops to residences, &c., can be seen as regards the district as a whole and as regards particular Exchange areas, and a study of the schedule from this angle would provide valuable information for testing the soundness of the development allowed in new studies.

It would also appear that if similar information were furnished to Headquarters in all development studies, valuable data could be compiled concerning the position and possibilities of telephone development. It may be objected that differences are bound to exist in the telephone development of different districts, and that there would be no value in making a comparison. Differences must exist, true; but if they are considerable, there is a prima facie case for asking why. A satisfactory explanation of a deficiency may be readily forthcoming. If so, good; but if a satisfactory reason cannot be found, it is thought that the enquiry should be pursued until either the missing customers are obtained or it is clearly demonstrated that they cannot be got.

INTER-DISTRICT CRICKET MATCH.

ON June 18 a team from the District Manager's Office, Sheffield, visited Nottingham, where a cricket match took place under ideal conditions on the Y.M.C.A. ground on the banks of the Trent, adjacent to the famous Trent Bridge Cricket Ground. The match resulted in a victory for Sheffield, the scores being as follow:—

District Manager's Office, Sheffield 131 (S. B. Townsend 42, C. V. Gaughan 42); G. F. Findley took 5 wickets.

District Manager's Office, Nottingham 48 (T. Mortin 16); Townsend and Gaughan each 3 wickets.

The return fixture was played on Aug. 15, on the ground of the Hallam Club. The visitors in this case gave a better account of themselves than on the occasion of the match at Nottingham, losing by two runs only.

District Manager's Office, Nottingham 75 (T. Allen 27); Gaughan took 8 wickets.

District Manager's Office, Sheffield 77 (C. V. Gaughan 24, E. Gregory 20); G. F. Findley took 5 wickets.

RECEPTION FROM SOUNDER BY TYPEWRITER.

BY W. T. L. (*Central Telegraph Office*).

THREE years ago, in the course of an article on "Typing from Sounder," that appeared in these columns, the writer advocated the adoption of one or more circuits at concentrator points for reception from sounder by typewriter, pointing out a few of the advantages gained thereby. The idea was criticized by one who, now an overseer, commands, and has for long years commanded, the greatest respect of the staff. But, misapprehending my statements, the gentleman in question instanced the failure of the "try-out" some few years previous, when a whole division was equipped with machines for the purpose—a fact which I had already commented upon.

I therefore wish to emphasize that, at the time of writing, I only suggested the system as a means of assisting with the reception of duplicate copies—such as press, or heavy pressure of work on a few concentrator circuits.

My critic incorrectly assuming that I suggested wholesale introduction, asserted that the idea would be impracticable owing to the noise of the machines. In fact, I pointed out the why and probable wherefore by referring to the advantage in this respect that cable company telegraphists had over those at the C.T.O. I therefore intended to convey the impression that such circuits should be segregated from other morse circuits; and placing them on a separate row in close juxtaposition to the control board would have sufficed.

Now, however, it is presumed that in the very near future every morse circuit will be similarly equipped and all messages will be transmitted by typewriter.

When one gets used to it, the system is much more simple and easy than most people imagine. Even the most dubious of receiving clerks will find that this is so, for it matters not how fast the transmitting clerk at the distant station may be sending, he or she will find that the difficulty will be to prevent themselves from completing words before the signals have formed the letters.

It is concluded that sounder-boxes will be reconstructed to that of the "gaspipe" pattern, and here it would be convenient to mention that, as one who has had much practical experience at both types of boxes, the principal item to remember is—concentrate on the sounder, and, if an ordinary typewriter is used, ignore as much as possible the noise of the machine. In the writer's opinion a standard sounder-box and ordinary typewriter would ensure most efficient training in the school.

The following points will be worth noting when taking up a position at a "live" circuit:—

(1) See that the movement of the roller-bar will not be impeded by any instruments, such as relays, rheostats, or resistance boxes.

(2) Always test the machine for good and clear impression.

(3) Test the spacing bar and lever, &c.; so as to ensure smooth and comfortable working.

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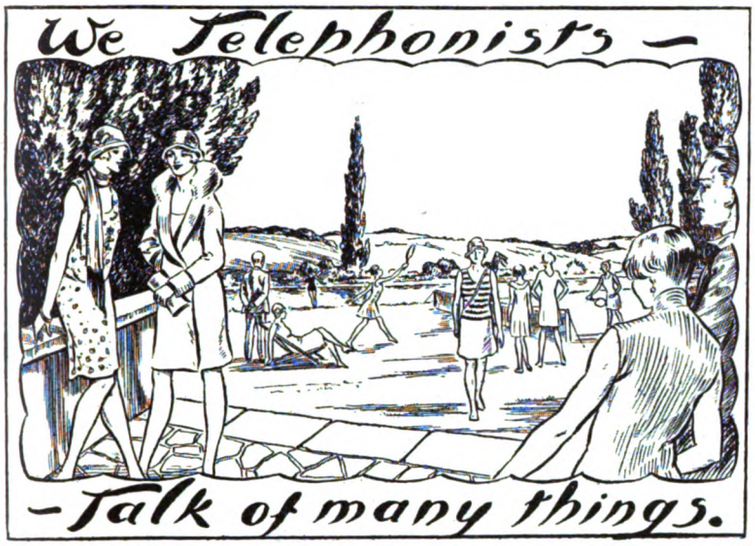

The Oldest Inhabitant.

THE path leaves the road and climbs up a winding route on the edge of a field to meet a wood set on the top of a hill. Then it breaks off sharply to the right and, keeping to the edge of the slope, it skirts the wood. You may, if you wish, pause here and look down across the valley. If you did you would notice a faint curl of smoke from a tiny hidden hamlet and the square top of a church tower. You would remember that, lower down, a stream fringed with rushes and wept over by willows meanders through pleasant fields and that presently, leaping into life, it trips and sparkles down an aisle of trees like a rustling bride hastening to her lover. Beyond, as the land rises again, you would see the dark pines with here and there a break of a gravel pit. You might suppose, if you thought of them at all, that they were amphitheatres made specially so that men might sit to watch the play of nature—the contest of light and shade, the graceful movement of trees and rippling corn, the race of sun-flecked cloud, the glory and might of the sun and the pale mystery of the moon.

I had paused and was feasting my eye, just as you might have done, when I became aware of the approach of an old man. He was only slightly bent and he walked, not slowly but contentedly and as of a purpose. He was rustically clad and he carried a stick more, I judged, from habit than for use, for he seemed still sound of limb. His whiskers were such as are rarely seen " in the flesh," shall I say ; the sort that figure in the conventional pictures of the farm labourer complete with oleographic grand-daughter. He greeted me with a cheery good-evening and said he was just going to revisit the scenes of 40 years ago—where he " used to do his courtin'." And the remark was accompanied with a prodigious wink and a poke in my ribs. Then, he said, he hoped to call on some of his old cronies—that is, if he could get so far—and have a chat and a drink and a smoke. I passed him my pouch, and, taking a modest dip, he told me of his sons and how they had come back from the war—except one—and of his dog and how " her suffered from rheumatism and couldn't walk fur now " and how he could do better than she although he was seventy-nine. He asked me where I was going and whether I knew the way. I described the route I proposed to follow and he winked again and told me it was a lovers' walk. He chuckled and twinkled and then said suddenly, " I didn't tell her I was coming. I didn't tell my wife. No ! I just come out without saying where I was going—but I don't know whether I'll get so far. So if you're passing my cottage —second past the inn—you can tell her as you've seen me." And with that he bid me good day and hoped heartily that I'd have a pleasant walk. " No, no, I didn't tell her," he said with another wink. And neither did I—the gay old dog.

I hope he lives to be 99. I hope he got there and had a good time and reached home safely. I hope Joan did not rate her Darby too soundly. I hope I shall see him again, and I hope that when I'm as old as 79 I shall be young enough to wink and chuckle and to go out on the razzle like the youthful oldest inhabitant.

PERCY FLAGE.

The Psalm of Strife.

Tell me not of calls misrouted,
  I will tell you what I mean
When a sub in haste dials Finchley
  Gets his wife at Palmers Green.

Thornton Heath comes through in earnest,
  C.C.I. is now their goal.
If the markers are all glowing
  Then they borrow over Toll.

Not enjoyment and not sorrow
  Is our destined end or way,
If a call you want to-morrow
  Start to dial that call to-day.

When they start the Tandem battle,
  Keying out the nine for fife,
Do not let them charge you extra,
  Dial the super for dear life.

Lives of auto men remind us,
  We can make our calls sublime,
If we use the dial correctly,
  And we listen every time.

Life is real, life is earnest,
  And whatever be your fate,
If you try to dial Holborn,
  Learn to labour and to wait.

When you muddle with the auto
  Do not break the dial and cuss
But go nimbly on life's highway—
  Try to get there on a bus.

Let us then be up and dialling
  Or the calls will be too late.
Still achieving, still pursuing,
  Auto now will be our fate.

M. PILOT, N.D.

Our Portrait Gallery.

No. 1.—JEAN MARGARET MCMILLAN.

It is fitting—even though wholly against her inclinations—that the first picture of our new series of Telephone Women should be that of the Editress of the Telephonists' column of this Journal, one of the best-known members of the London Telephone Service.

Officially, Miss McMillan is a Higher Clerical Officer of the Statistical Section, high priestess of the mystic rites which surround the naming of exchanges—a work admirably suited to her literary gifts and aptitude for historical research. By way of light relief, she also presides over the construction of that merry maze of statistics known as the London Peg Count Summary !

Probably, however, it is as the Service playwright that the subject of our picture is most widely known. Year by year her clever and whimsically humorous topical musical plays appeal to a delighted audience, ever eager for more. " As You'd Like It, or Much Ado About Something," " Yesterday, To-day, and To-morrow," " Nothing Like the Truth," " Holborn Calling and Other Trifles," " Telephone Tangles, or Love in a Mist," provide a series of topical plays surely unique in the history of any telephone organisation,

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and one of which members of the London Telephone Service are rightly proud.

As her name indicates, our playwright is a Scotswoman, sharing to the full all the high courage, romance and chivalry which have characterised the Britons of the North since the dawn of history. In every fibre of her being she is an eloquent refutation of all the libels on her countrymen ever invented by the subtly-humorous Scot for the delectation of his more gullible Southern neighbours.

An ardent lover of the beautiful in Art and Nature, Miss McMillan's literary bent perhaps finds its fullest satisfaction in poetry; and it would be difficult to find in the London Service anyone with a wider and deeper knowledge and appreciation of the master-works of this branch of literature.

But, despite her literary and artistic tastes, our subject is no recluse. Full of the joy of living, a lover of the sea, the open road, and the wide spaces of the world, she brings both to work and play an infectious gaiety all her own; but a keen sense of justice and a deeply sympathetic insight into the feelings of others keep her humour ever kindly. Ever ready to champion the cause of the under-dog, most loyal of friends and most generous of opponents, it is no wonder that the London Telephone Service loves its "pet playwright."

Spelling by Analogy.

A contemporary says:—

"Telephone users who use the instrument for the despatch of telegrams are familiar with the Post Office code of spelling, such as "A for Apple," "D for Dover," and so forth. A friend in Paris tells me that the postal authorities there have adopted a similar system, and with the growth of the use of the London-Paris lines we need to become familiar with it." He then gives the names used; but as, to quote him again, "they ring unfamiliarly in English ears," perhaps the following rhyme will help us to memorise them:—

"A" stands for Anatole (France, and no other),
"B" is for Benjamin, Joseph's young brother;
"C" for Celestin, une demoiselle pretty,
"D" for Désiré, who works in the city.
"E" is for Edouard, *he* owns a villa,
"F" is for François (complete with cedilla).
"G" stands for Gaston (Leroux, si vous voulez),
"H" is for Henri (no mot fits but "poulet").
"I," Isidore, is a name we can't love,
"J" is for Joseph, whose frère is above.
"K" stands for Kléber, a strange nomination,
"L" for Lazare (with a "Saint" he's a station).
"M" is for Marie, coquettish, I guess;
"N" stands for Nicolas—don't sound the "s."
"O" is for "Oscar (see "Dorien Gray");
"P" for Pierre (or for Peter, our way).
"R" stands for Robert, who lives near the Somme,
"S" is for Samuel, Eli's jeune homme.
"T" is for Théodor, Boulevard frequenter,
"U" for Ursule, who a convent will enter.
"V" is for Victor, un homme comme il faut,
"W," William, is English, I know.
"X" is for Xavier—he was a saint,
"Y" for Yvonne, who's attractive, though quaint.
"Z" stands for Zoe—c'est fini! Voila!
Voici ze Alphabet; n'oubliez pas.

The Death of Old Reliance.

Full many a year has passed away
And now we all are sad and sighing.
Take out the peg and the number plate,
For these are sadly out of date,
"Reliance" is a-dying.
Old friend, you must not go;
You came to us so readily,
You lived with us so steadily,
Old friend, you shall not go.

The subs are still; they do not call;
They will not flash and glow again.
They now will use the auto dial,
'Twill doubtless prove to them a trial,
They'll call for girls in vain.
Old friend, oh! do not go;
So long that you have been with us!
Such times that you have seen with us!
Old friend, you shall not go.

He was full of irate subs.
But all their swearing now is o'er.
To make him die the engineers
Did speed away with all their gears.
And now he is no more.
No good to sigh and moan;
C.B. is old and stale, my friend;
And Auto, new and hale, my friend,
Claims "RL" as its own.

I. E. R. J., Rodney.

Contributions to this column should be addressed: THE EDITRESS, "Talk of Many Things," *Telegraph and Telephone Journal*, Secretary's Office, G.P.O. (North), London, E.C.1.

LONDON ENGINEERING DISTRICT NOTES.

Retirements.

MANY changes are taking place in the personnel of the London Engineering District and others are pending. In addition to those referred to in recent notes, we have to record this month the retirement under the age limit of two Executive Engineers and an Assistant Engineer. Mr. C. Appleby was in charge of the Centre External Section, Mr. R. A. Wells was in charge of the North-east Internal Section, and Mr. F. J. Phillips was Assistant Engineer in the West External Section. In each case a suitable presentation was made by their colleagues and wishes were expressed for a happy period of retirement. As each of the officers is retiring in sound physical health and full mental vigour there is every reason to believe that the sincere wishes of their friends will be realised.

If the suggested history of the Engineering Department is written it will be found that the years served by these gentlemen were amongst the most eventful in that history. When the mantle of the prophet is donned it is often found to be a misfit, yet it is difficult to refrain from prophesying that the next 40 years will not unfold greater changes than it has been the lot of the above-mentioned officers to see in the 40 years just passed. Of course, 40 years is a long time and the applications of science to all forms of industry are advancing rapidly. Moreover, there is always the possibility of a discovery which is so entirely new that it cannot be regarded as a development but as epoch making. Nevertheless, when it is remembered that at the time of the entry into the service of our colleagues who have just retired, the telephone was still in its infancy and that they saw the introduction of paper core cables, loading coils, thermionic valve repeaters, common battery and automatic telephones, and that sandwiched in these years was the great world war and all the problems of communications which it produced, it will be granted that the coming years will have to produce many very drastic changes if they are to equal in variety the 40 years just passed. To those who, to a large extent, have been contemporary with the men recently retired it is rather a sad thing to see the departure of one after another of those who have so cheerfully borne the burden of the strenuous years and have triumphed over each new difficulty. But this sadness is mitigated when consideration is given to the splendid traditions of loyal devotion to duty which they have helped to build up and to the evident appreciation of these traditions by the younger members of the staff. While this spirit remains there need be no fear that the Engineering Department of the Post Office will suffer in comparison with any other public or private concern in this or any other country.

Underground Operations.

From time to time traffic jams are caused by street operations and a long-suffering public expresses in unmeasured terms its opinion of those responsible for causing the obstructions. Very few, however, know of the extensive planning that precedes these operations in order to shorten the period of interruption, nor of the extensive work that may be going on underneath the undisturbed portion of the carriageway over which they are riding. An operation has recently been carried out in the vicinity of Whitehall of which the only evidence to the passer-by was a pile of earth, bricks and ironwork surrounded by trestles at the side of the road! A site for a new exchange to accommodate 20,000 lines was required in this area, and the only available site was in a court which is approached by a narrow passage. The whole space underneath this passage was occupied by cellars, and although it may have been possible to lay a few pipes, the room available was altogether inadequate for the hundred ducts that were required. Adjoining the site was a large block of Government offices. No building is sacrosanct to a telephone construction engineer. Permission was therefore sought to tunnel under the foundations of this building. Surprise was expressed, but ultimately consent was given. The manhole in the adjoining thoroughfare had to be of great depth in order to get access to the tunnel. The thoroughfare carried a considerable amount of traffic and moreover was congested underneath the surface with pipes and sewers. The Post Office Engineers tunnelled under all these and ultimately got as far as Whitehall. At this point there was a busy omnibus halt, so the tunnel was continued across the road. Ducts were laid in the tunnel and the excess space filled in with concrete.

Trial holes had shown that the desired route from this point via Charing Cross was congested with pipes and in addition, the dislocation to traffic would probably be serious if an attempt were made to lay ducts in an open trench. Permission was therefore sought and ultimately obtained to tunnel underneath

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the foundations of a large commercial building which was in course of erection and so to gain access to a back street. The only possible route for the tunnel made it necessary to pass close to some ancient buildings which had to be shored up and underpinned. Then it was found that obstructions existed in the back street which could not be tunnelled under, and from working at a depth of about 20 feet it was necessary to lay pipes just underneath the paving. This involved a change from earthenware ducts laid in a mass and surrounded with concrete to steel pipes laid in shallow formation grouted in with mortar and covered with a steel plate to prevent accidental damage. Ultimately, a nest of conduits was provided between Craigs Court, Whitehall, to The Mall, and the north side of Trafalgar Square and other points where connexion could be made to existing duct routes.

Other operations of this kind are now in progress. Before they are put in hand very careful estimates of the requirements are made so as to ensure that the same thoroughfares will not need to be disturbed again for many years, but of course there is a limit to the extent to which provision can be made for the future and estimates are liable to fail. The Post Office is only one of many undertakers using the space under the road surfaces, and those concerned in the present operations—difficult as they are—cannot avoid thinking with some pity of those who on some future occasion will have to augment these routes. Perhaps, however, the pity is wasted and before the present provision is exhausted other means of communication will have been invented which will not involve the use of wires under the streets.

Centralised Service Observation Equipment.

This equipment has been installed in the Wood Street building to accommodate the observation junctions connecting the exchanges in the London area. Each junction has access to 25 or more subscribers' lines.

The outstanding feature of this equipment is that the subscribers' call when picked up at the distant exchange is automatically routed to an idle observation operator's position.

The observer's receiver is connected to the observed subscriber's line enabling the observer to hear all audible signals and speech on the subscriber's line.

A lamp number display shows the number, digit by digit, as the observed subscriber dials (outgoing calls). The following visual and audible signals are received at the observation position :—

(1) Pilot lamp lights at commencement of call.
(2) "A" lamp lights under control of observed subscriber's switch hook.
(3) "B" lamp lights :—
  (*a*) When the observed subscriber's line is seized for an incoming call.
  (*b*) When the metering condition is applied to the observed subscriber meter.

A tone is also heard by the observer when the metering condition is applied.

When a call is connected to an observation position the observer has control of the observation connexion and has the following choices :—

(*a*) Maintain the whole of the observation connexion to enable observing of successive calls to or from the same subscriber.

(*b*) Release tapping unit only, but maintain contact with the junction which enables calls to or from observed subscribers at the same exchange to be observed, i.e., concentrating the observation of a particular exchange on to one observation position.

(*c*) Release the whole of the observation connexion thereby freeing the observation panel for further calls from any exchange.

Facilities are provided at the central point to enable calls incoming to the subscriber to be rejected from the observation equipment.

When the junction is engaged all other tapping units are locked off the junction, also if the observation connexion is released during a call the tapping unit concerned is locked off the junction for the duration of the call, and if all observation positions are engaged release conditions are set up on junctions not in use to release tapping units which may be connected by observed subscribers making or receiving calls.

The junction equipment at the central point has been designed so that observation on manual exchanges and phonogram circuits can be observed on the same observation positions which are being used for auto subscribers.

It is worthy of note that throughout this equipment all switching and connexion is performed by selectors and relays, keys are only used to give access to the various controls, no jacks and plugs are used on the observation panel.

The equipment has been designed entirely by officers of the Engineer-in-Chief's Department, and the circuits at the observed exchanges are identical for all the various contractors' exchanges.

New Automatic Exchange.

Name and Address.	*Date opened.*	*Manufacturers.*
Metropolitan, Wood Street, E.C.	Aug. 31, 1929.	Automatic Telephone Co.

LONDON TELEPHONE SERVICE NOTES.

Contract Branch Notes.

THE business done by the Contract Branch during the month of July resulted in a net gain of 4,671 stations as compared with 3,865 last year.

An agreement for service handed to a visitor at the Ideal Home Exhibition in March, 1927, was received duly completed at the Western District Contract Office on July 25, 1929. Truly a case of "Cast thy bread upon the waters and thou shalt find it after many days."

A lady writes "the extension of the telephone to my bedroom upstairs at . . . is a great comfort and I am very glad I had it done." We are glad also, and having preached the value of extensions in season and out of season it is pleasing to have our views confirmed even by one of the thousands who have had extensions installed as a result of the post card advertisement sent out with accounts.

The additional convenience afforded by extensions is often more appreciated than the easily forgotten value of the telephone service itself, and the cost of extensions is insignificant to a telephone user.

An arrangement of some interest was discovered a short time ago when it was found that a telephone subscriber who lived a short distance from a multi-coin box kiosk, which had not been fitted with an emergency press button, had adopted the ingenious idea of placing two pennies on the top of the bell box and sticking them down with a piece of adhesive tape. He explained that his idea was in case of fire he might be caught in such a position that he could not rush back into a blazing house to use his own telephone and as he was not in the habit of keeping the necessary coins in his pyjamas these pennies would be immediately available. His neighbours were all aware of this arrangement so that it would be equally helpful to them. It is not proposed to disclose the neighbourhood of the kiosk lest some thoughtless individual might show a lack of appreciation of this foresight. The gentleman who was the author of this ingenious arrangement had served in the Navy.

* * * *

L.T.S. Bowls.

The last game in the "A" section of the league was played on July 22, when the Science Museum were defeated by 65 shots to 45 shots. The club's final record in the competition now reads, played 7, won 6, lost 1; shots for, 458; shots against, 369. This result ensures the L.T.S. the championship of the section and they have qualified to meet the winners of the "B" division for the Bunbury cup.

The deciding match will take place at Chiswick in September on a date to be arranged.

In addition to the Bunbury cup final two club games are down to be played on Sept. 9 against the C.T.O. and Sept. 10 against the Engineers.

Players are requested to make a note of these dates.

It is pleasing to record that one of the club's players, Mr. Hutchinson has been invited to play for Scotland in the championship tournament at Chiswick this month.

* * * *

An L.T.S. Bowls Tragedy.

The air was still—a sudden thrill
  Ran through our little rink
As number two and number three
  Crept off to get a drink.
When number one, the son-of-a-gun,
  Bent down to do his stunt
With a startling snap from under a cap,
  Came orders—"Face your front."

Poor number one, his training done
  In days when war occurred,
Just dropped his wood and there he stood
  And waited for the word
To stand-at-ease or bend his knees.
  But ne'er a sound came back,
For it must be told he was badly sold
  By an animated "Jack."

When two and three returned from tea (?)
  The sight they saw dismaying
A wood in the ditch and one on the pitch
  Of cricketers nearby playing
Said number two, whose coat of blue
  Had badges back and front,
"Leave this to me, for I can see
  Two Jacks. I'll bear the brunt."

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Alas! alack! his arm came back,
'Tis true he did his best,
But he forgot, when taking shot,
The gold braid on his chest.
He sank beneath that heavy sheath
Of badges round his chin:
Now R.I.P. is all we see
Of a little boy called "Jim."

Poor number three, now all at sea,
Heard skip say with a snort,
"I want one here, I want one clear,
I want one "up," one "short."
He wiped his eye, said with a sigh,
"All skips are sent to try us."
With quaking heart he made a start
And sent one up—wrong bias.

The skip stood there and tore his hair,
His jaw was quickly tight'ning.
Then with a bound he cleared the ground
His wood flashed by like light'ning,
With "country fine" he smashed the line
And took the jack careering
Just like a star into the bar
Where one, two, three were . . .

H. A.

[The bard seems to suggest that the three were tea-tasting again.]

* * * *

Cricket: London Telephone Service.

One of the most interesting matches of the year is the annual fixture between the Cricket Champions and the rest of the league.

The event is somewhat in the nature of an anti-climax after the keenness displayed in the competition games, and the latest fixture provided perhaps the most interesting and enjoyable game of the whole series.

The champions have been considerably strengthened this season by the addition of several promising young players, and they seem to have hit upon the happy combination of youth and experience which generally succeeds more frequently in cricket than in other games.

Batting first, "The Rest" were in danger of being overwhelmed by the excellent bowling of Shepherd and Merrick, but a timely stand midway through the innings and a healthy and vigorous knock of 46 by White, a young and improving youth from the Messengers' team, altered the outlook, and with the tail wagging a respectable total of 139 runs was reached. The champions opened quietly with Beaumont and Webb, but very soon the "Captain" found one or two opportunities of exploiting his favourite sweep to leg and quickly scored 20 runs when he was bowled by Moon.

Adams 23 and Merrick 26 not out were the other chief scorers, the innings closing for 95 runs.

Pearkes bowled very effectively and his final analysis of 8 wickets for 47 runs was his best performance of the season.

Scores:—

The Rest.		*Champions (Traffic Branch).*	
F. Pearkes, c. Pountney, b. Shepherd	4	B. Beaumont, c. Lester, b. Pearkes	4
G. Moon, b. Merrick	8	J. Webb, b. Moon	20
F. Young, c. Shepherd, b. Merrick	8	F. Thomson, lbw., b. Moon ...	0
R. White, c. Merrick, b. Adams	46	J. Shepherd, b. Pearkes ...	5
F. Moyle, c. North, b. Merrick	9	H. Adams, c. White, b. Pearkes	23
L. Murfit, c. Thomson, b. Shepherd	0	H. Pountney, b. Pearkes ...	0
J. Dickinson, l.b.w., b. Shepherd	9	F. Bishop, b. Pearkes ...	0
H. Lester, c. & b. Merrick ...	25	L. Walby, c. Murfit, b. Pearkes	9
G. Lewis, not out	9	E. Sweetingham, b. Pearkes ...	4
C. Drabwell, c. Sweetingham, b. Shepherd	7	H. Merrick, not out	26
—. Loban, c. & b. Shepherd ...	3	J. North, c. Murfit, b. Pearkes	0
Extras ...	11	Extras ...	4
	139		95

This is the "League's" third year, and the Cricket Shield kindly given by the Controlling Officers for competition has been won in turn by the three founders of the tournament, i.e., the Accounts Branch, the Contract Branch, and now the Traffic Branch. The Messengers, who only joined the league this season, have so far found the opposition too strong for them, but they will certainly do better, and have added to the interest of L.T.S. cricket by the enthusiasm they have displayed in the face of continued defeats.

Looking ahead, it would appear that future prospects are particularly bright. Many young and hopeful players are entering the various branches of the service and there is promise of a further addition to the league next year by the introduction of a team of Night Telephonists.

A tribute is due to the various "Heads of Departments" who have been agreeably helpful in promoting the various cricket events of the season.

Soon, perhaps next year, it should be possible to field a cricket eleven able to hold its own against the selected of any other Service Department.

L.T.S. Sports Association: Tennis.

The competition for the "Pink" Cup is now reaching its final stages. The semi-finalists are Miss Parker, of Maryland, and Miss Palmer, of Enfield. Miss Wilson, of A.R.1 Accounts Branch, has beaten Miss Fagan of R1, and is now waiting to meet the winner of the other semi-final in the final, which will take place at York Gate, Regent's Park Hard Courts, on Saturday Sept. 7, at 3 o'clock.

The "Agnes Cox" Cup Tournament is also approaching completion. The semi-finalists are Clerkenwell *v.* R1 (Accounts Branch) and AR4 (Accounts Branch) *v.* Central.

The final in this competition will also be held at Regent's Park, the date being Oct. 5, at 2 p.m.

The presentation of the Cups, as well as the Association prizes, Cricket Shield, and Bowls trophies will be deferred until a Social and Dance is arranged by the Committee, the provisional date for which is Wednesday, Oct. 16, at Cornwall House. Full details will be issued as soon as the final arrangements have been made.

* * * *

Table Tennis.

It is proposed to run another competition, similar to last year's, when over 90 entries were received, during the coming winter. Particulars will be circularised to all exchanges and office sections in due course. Separate competitions will be arranged for ladies and gentlemen. The Secretary, Mr. Hough, of the Accounts Branch (A.B.), hopes to receive an even larger number of entries than last year. The entrance fee, as heretofore, will be 6*d*.

MANCHESTER NOTES.

A PARTY representing all branches of the Telephone Service at Manchester spent Bank Holiday in a novel and enjoyable way. We sailed the 35 miles of the Manchester Ship Canal (by kind permission of the Manchester Ship Canal Company) from Trafford Docks to Eastham, crossed by Ferry to Liverpool and returned to Manchester by train.

Under the leadership of the District Manager (Mr. J. T. Whitelaw), the party embarked at 9 o'clock on the 500-h.p. Steam Tug *Ralph Brocklebank*. On working days this is one of the eighteen tugs which help great liners up and down the Canal, and in spite of its diminutive size (by comparison with the big ships which we passed) it had seen War service in the unpleasant capacity of "bait" on submarine chasing expeditions.

As we sailed down the Canal we saw ships from all corners of the world, some of them bringing 8,000 tons of cargo to Manchester. We passed Barton Aqueduct where the Bridgewater Canal passes over the Ship Canal and a slice of it swings round like a bridge to let ships pass. Throughout the length of the Canal there was hardly a moment when some new item of interest did not present itself. The Canal Company had also placed at our disposal pamphlets giving the history of the Canal since its opening in 1894.

It had been expected that some members of the party would rise to the occasion and turn out in white ducks and yachting caps, but in this we were disappointed. We boasted only one Sou'wester. No high seas were encountered. The ship was not guilty of a single roll, and our only experience of "that sinking feeling" was of the very mildest variety, as we sank slowly in the emptying locks.

There was some dancing on the lower deck, but the style of the dancers was cramped by the number of nautical fittings of which there was at least one per square yard. Vocal items were rendered by a small choir on the bridge and an air of great jollity pervaded the ship. In due course lunch was served on deck by an enthusiastic party of volunteer "Nippys."

At Eastham, where we took leave of the Ship Canal, a spirit of Bank Holiday gaiety prevailed and each ferryboat brought more and more eager trippers from Liverpool.

Unfortunately, we had not time to sample the pleasures which were attracting so many and, hardened sailors by now, we took to the water again sailing across the Mersey to Liverpool.

At the Gainsboro' Cafe the whole party had tea together, and before we left the District Manager expressed the thanks of all to the organisers of the excursion, while Miss Slater responded on their behalf.

Liverpool seemed mainly to be inhabited by Scouts of all nationalities exploring every corner of the city, and after tea we dispersed to join the exploration.

The fact that most of the party were already familiar with the work of Sir Gilbert Scott in the design of the new kiosks may have been responsible for the interest in his more imposing work which drew so many to the Liverpool Cathedral.

After a threatening sky in the morning we had so far been fortunate enough to have a fine day, but in keeping with our feelings of regret as the time for departure approached, the rain came at last.

The party re-united at Exchange station. We returned to Manchester by train, happy and proud of the wonderful feat that brought the sea to Manchester, and so brought to a close an interesting adventure and an enjoyable day.

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GLASGOW TELEPHONE NOTES.

MISS A. T. MCNAIR, Assistant Supervisor, Class II, Central Exchange, was the recipient of many presents, including a solid silver tea service and a silver and pyrex casserole subscribed by her colleagues and friends throughout the Service.

On the afternoon of Aug. 8 Miss McNair (who, by the way, is about to run in double harness) entertained the Supervisors to tea.

We all join in wishing her the best of luck and all happiness in the future.

Miss E. McCormick, Central Telephonist, left the Service on the 10th and sailed for India on Aug. 13.

The Staff presented her with a special cabin trunk and a travelling rug.

Miss McCormick carries with her the good wishes of her colleagues for her future success.

Verbal Tennis between one of our Contract Officers and a subscriber who did not see why the Department, &c., &c. :—

"You telephone men are as much trouble to me as the Sanitary Inspectors." "Well, sir, you see we look after the ether and they look after the odour."

Extract: "I have had the Telephone over 10 years and congratulate you on the nice, courteous service from your local operators."

The Modern Author on the Telephone.

"In the instinctive reliance upon one's physical means of locomotion one forgets that the telephone works nearly one hundred and five million times as fast as a man can run."—(Egbert).

"A deaf person somewhat resembles a telephone, which appears to be an appliance for conveying information to everybody but the person addressed."—(Freeman).

"I should like to use the telephone, if I may! He was shown into the private office, where in response to polite and repeated requests a lady at the exchange found leisure to connect him with Shepherd's Oyster Bar. . . . "I have only just finished telephoning," he said. "The Central Exchange are like the gods. They never hurry."—(Bridges).

"The amazingly complex affair began with the ringing of the telephone bell as we sat at breakfast that gloomy, chilly, mid-November day. Telephones ring for many purposes, trivial and tragic, but this one rang up the curtain on a play that was to hold us fascinated until dull November was a thing of the past."—(Temple-Ellis).

"If there was anything he particularly hated, it was to be called away from a good breakfast by the telephone."—(Triem).

"The telephone bell trilled, and with a stifled malediction he stepped over to the instrument."—(Connington).

"She snapped the word at him as if she were hanging up a telephone receiver."—(Edholm).

"The lawyer's voice sounded a little queer over the telephone, but she blamed that to the instrument."—(Roberston).

"We've been kept awake nights with that blamed telephone bell jangling so much."—(Spears).

"Your Solicitors are on the 'phone—Messrs. Hardy, Hardy and Hardy." "What, all three of them."—(A. Non).

"Seating himself at his desk, he pored over the fine print of the little red telephone book for about ten minutes and then sat back with a satisfied expression on his face."—(Baron).

"We do not call telephones miraculous, though they would have seemed so two hundred years ago; they are not miraculous because their mechanism is understood."—(Dean Inge).

"Well I wasn't exactly fishing for your telephone number."

"Wait a minute, I want to do a little 'phoning." He shut himself in a little dressing-room and called upon the lightnings of the heavens—condensed into unromantic numbers and districts" . . . "Is that you?" said I, employing the foolish words that form the vocabulary of every talker through the telephone." . . . "Imperious What's-his-name, dead and turned to stone—No use to write or call him on the 'phone."—(O. Henry).

"He promised to put a bullet in me if I ever came near him, and —— The flesh is weak but the telephone is ever ready."—(Buckley).

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A BRIEF CHRONOLOGY FOR STUDENTS OF TELEGRAPHS, TELEPHONES AND POSTS.

BY HARRY G. SELLARS.

(*Continued from page* 230.)

1882, Oct. 1 ... Stamped reply postcards introduced.

Atlantic cable laid for Western Union Telegraph Company.

An iron screw-boat carrying 12 persons, driven by two Siemens dynamos of about 3 horse-power, moved at 8 miles an hour on the Thames. The electricity was furnished by 45 Sellon Volckmar accumulators.

De Jongh, of Belgium, introduced a system of duplex telegraphy in which one circuit is superimposed on a telephone loop while the other is in the loop.

Ostrogovitch patented a method of automatic Hughes working, using a keyboard perforator and hoping to attain an increased output.

Electric Lighting Act passed.

Dr. Hopkinson patented his three-wire system of distributing electrical power.

Baudot suggested the duplex balance system for equal letter multiplex telegraphy.

M. F. van Rysselberghe, of Brussels, discovered a means of utilising a circuit for simultaneous telegraphy and telephony. Circuit used between Brussels and Paris for simultaneous telegraph and telephone working.

La Cour invented a method of correcting telegraph distributors.

Patrick B. Delaney, of New York, improved on La Cour's device for synchronisation.

Ostrogovitch suggested sending a regular marking signal when traffic had ceased momentarily so that the synchronism of the distributors could be maintained. Picard adopted the method on the Marseilles-Algiers cable.

Metropolitan Postal Surveyors abolished and postal control of London and suburbs vested in the Controller of the London Postal Service.

Karl Wilhelm Siemens made Knight of the United Kingdom for services rendered in connexion with international telegraphy.

Nikola Tesla joined Edison's staff.

Bell exchanged telephonic wireless messages between the land and a boat on the river Potomac.

W. H. Preece experimented in wireless telegraphy between Southampton and Newport, Isle of Wight.

Mr. Shaw-Lefevre, M.P., appointed Deputy Postmaster-General with full powers to act during illness of Postmaster-General (Mr. Fawcett).

Stamps available for either postage or Inland Revenue, of higher value than one penny, introduced.

Postmaster-General (Mr. Fawcett) decided that rural posts should be established when revenue covered the cost—calculating eleven-twentieths instead of a halfpenny for each letter.

1883, Jan. 1 ... Rates for Colonial and Foreign Money Orders reduced to a scale ranging from 6*d.* for £2 to 2*s.* for £10.

M. de Cazenave, of Belgium, modified the Blake microphone.

Sir William Thomson (Lord Kelvin) said the system of nomenclature in electrical units and standards should be attributed to Sir C. T. Bright and Latimer Clark.

Dr. John Hopkinson proved theoretically that current alternators could be worked in parallel.

Delaney added damping-magnets to the reed used in connexion with the phonic wheel.

A. R. Bennett devised an electrostatic "call" wire telephone system.

Central Telephone Exchange established at Oxford Court, London.

A. R. Bennett and W. Langdon experimented with the object of obviating induction on telephone circuits introducing types of translators and transformers.

Play transmitted by telephone from the Comedy Theatre, London, to the Hotel Bristol, London.

Postal Stores Branch established and controllership created.

1883, June 22 S. Pitt patented a test system in connexion with multiple telephone switchboards.

C. J. Warner invented the telephone spring jack and plug.

1883, July 7 ... Dane Sinclair, of Glasgow, patented an automatic telephone system. J. L. Corbett joined him in making improvements.

Dr. Cameron proposed, in the House of Commons, that the minimum charge for Inland telegrams should be reduced to sixpence. The resolution was accepted.

1883, Aug. 1 ... Parcel Post service, organised by F. E. Baines, came into operation with rates ranging from 3*d.* for 1 lb. to 12*d.* for 7 lbs.

Cromwell Fleetwood Varley died.

Sir Charles William Siemens died.

James Wimshurst constructed an electrical machine.

A. E. Dolbear experimented in wireless telegraphy at Boston, U.S.A.

1883, Nov. 8 ... Willoughby Smith suggested an apparatus for telegraphing between moving trains without wires.

1883, Nov. 15 Edison filed a patent specification describing a discovery that when a metallic conductor was interposed in the vacuous space within the bulb of an incandescent electric lamp and externally connected to one side of the filament circuit, a portion of the current traversing the filament was diverted to the metallic conductor through the vacuous space. The effect noticed was called the "Edison effect" and may be considered as the germ of the idea of the thermionic valve.

1883, Nov. 20... F. B. O. Hawes' horizontal multiple telephone switchboard brought into use.

1883, Dec. ... Addition of 1*d.* for each parcel added to the calculation provided for in 1882, in connexion with rural posts, and ½*d.* for each parcel when a second delivery of day mails was desired.

12,500,000 Postal Orders issued, value £5,000,000.

1884, Jan. 3 ... At Mr. Fawcett's suggestion payments for Post Office Insurances and Annuities could be made through deposits in Savings Bank, and restriction as to "certain towns" abolished.

Free certificates of posting for unregistered parcels introduced.

Local Government Board asked to regulate the erection of overhead telephone wires.

1884, Feb. 19 A. A. Campbell Swinton patented a telephone transmitter, without a diaphragm, consisting of carbon pencils suspended vertically by a horizontal platinum wire, adjustment being obtained by varying the inclination of the frame.

First upright multiple telephone switchboards installed at Liverpool.

Elisha Gray introduced a harmonic multiplex telegraph which was worked between New York and Boston.

Patrick B. Delaney introduced a synchronous multiplex Morse telegraph system.

Ericsson devised a hand micro-telephone.

C. Langdon Davies invented the phonophore telegraph.

1884, June 2 ... Postal Orders issued in a longer series of values, but within same limits. Postage stamps to the value of 5*d.* could be affixed to the Order.

1884, June 24 United Telephone Company absorbed the London and Globe Telephone Company.

1884, Aug. 7 ... Postmaster-General (Henry Fawcett) announced terms under which telephone companies were empowered to provide a telephone service.

Calzecchi Onesti, of Italy, constructed a detector for use in Wireless Telegraphy.

Cable laid between the Sunk Lightship and Walton-on-Naze Post Office in connexion with saving of life at sea.

Two Atlantic cables laid for Commercial Cable Company.

International Congress of Electricians, in Paris, fixed the value of the legal ohm.

International Telegraph Conference, in connexion with the question of neutrality of cables in war time, said, "*Il est bien entendu que les stipulations de la presente Convention ne portent aucune atteinte a la liberté d'action des belligèrents.*"

Hughes devised a Magnetic Balance for testing the magnetic properties of iron and steel.

(*To be continued.*)

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THE TELEGRAPH AND TELEPHONE JOURNAL.

VOL. XVI.

October 1929—September 1930.

LONDON: G.P.O. NORTH, E.C.1.

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THE

Telegraph and Telephone Journal.

VOL. XVI. OCTOBER, 1929. No. 175.

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Subscription: To the public, 5s. 0d. per annum, including postage. To the Staff, 3s., including free delivery to any Post, Telegraph, or Telephone Office. Single Copies: To the Public, 4d. each, or post free 5d. To the Staff, 3d. each. Orders should be sent to the Managing Editor, TELEGRAPH AND TELEPHONE JOURNAL, *G.P.O. North, London, E.C.*1.

All correspondence relating to advertisements should be addressed to MESSRS. SELLS, LTD., 168, *Fleet Street, London, E.C.*4.

TELEGRAPH AND TELEPHONE MEN AND WOMEN.

LXIX.

MR. G. T. ARCHIBALD.

THE portrait this month is that of Mr. G. T. Archibald, who has recently been appointed to an Assistant Controllership of the Central Telegraph Office, and who previously was Inspector of Telegraphs in the Headquarters Telegraph and Telephone Traffic Section. In his former position he was thus in lineal official descent, though bearing a different title, from the Telegraph Traffic Managers whom, about 30 years ago, the Post Office Administration took the bold and novel step of appointing. The scope of responsibility of the early Traffic Managers was somewhat restricted, but a new conception of traffic management sprang from the union of the telegraph and telephone systems in 1912 under Post Office control, and led to the establishment in 1916 of the present Traffic Section with wider responsibilities than were accorded to the Traffic Managers.

[*Photo by Miles & Kaye.*

Mr. Archibald, who had spent nearly twenty years in the telegraph service at Manchester, joined the Traffic Section on its formation and was promoted to Assistant Inspector, Class I, in February, 1920, and to Inspector in August, 1926.

Since the War, the machinery and operating methods of the telegraph service have undergone extensive changes, and in that process the energy and practical knowledge of Mr. Archibald have been of the utmost value. Mr. Archibald was a member of the Sanderson and Comber Committees, the two chief post-war revising committees, and also of the Simon Commission of enquiry into the American telegraph service.

We believe that Mr. Archibald finds recreation in bowls, and, in spite of his official activities and journeyings, has acquired much skill in that game.

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UNDERCURRENTS.

How many readers of the *Journal*, outside those whose daily round brings them into close contact with the matter, realise the vast undercurrent of changes flowing constantly and in ever increasing volume among telephone subscribers ?

Readers are kept well informed of the progress of the system in this and other countries, but behind these net gain figures are movements which, in the aggregate, involve a vast amount of work and which are altogether unsuspected by the general public.

Perhaps a little light shed, from a London point of view, on some of these less advertised but nevertheless extremely important forms of activity, might stimulate interest and add to the general knowledge of those who are connected directly or indirectly with the telephone business, and who, owing to the nature of their work, are unable to see the wood for the trees.

Subscribers move about from place to place or require some alteration to the position of their telephone or apparatus. In London 37,839 such cases were dealt with in the year ended June last. These cases necessitate getting a form signed, the issue of the necessary advice note to the engineers and exchanges where a change from one exchange to another is involved, alterations to records, an addition to the quarterly account, dealing with the payment, and so on.

Another item, involving much the same routine methods, consists of what are known as transfers. These are divided into two categories, called for official purposes A to A and A to B. A to A cases are those where, roughly, the control remains the same, such as the reconstruction of a limited company or the conversion of a firm into a limited company, dissolution of partnership, and so on. A to B transfers are those where there is a complete change of control, such as when the telephone service is taken over from an outgoing tenant by the new occupier of the premises, &c. These will be referred to later. The total number dealt with in London during the year already referred to was 24,880. As the system grows these cases grow with it, and this will go on without end so far as we can see at the present time.

The ever increasing volume of ceasements, that is of subscribers who for one reason or another give up their telephone service, is one which causes the staff of the Contract Branch no little anxiety, although it is a perfectly natural movement which has to be met by all telephone administrations the world over. To be faced with the unpleasant fact, however, that orders for two telephones have to be obtained in order to get a gain of one, is one which has caused much thought, with the result that no effort has been spared to retain every possible station. The truth of the matter is, however, that the percentage of cases where retention is possible is small, and that we must endeavour to increase the new business by every means in our power to keep the "new" and the "ceased" as far apart as possible.

It has been indicated that many of the ceasements and their causes are quite beyond our control, and it may be of interest if some details of an analysis of the reasons furnished by subscribers for relinquishing the service are given.

Quite a considerable percentage of the actual "recoveries" are accounted for by the A to B transfers previously referred to. These are merely book-keeping transactions, however, as the service in these cases is continuous. Generally, transfers prove among the most troublesome cases with which the Contract Branch is called upon to deal, and as they account for no less than 27.3% of the ceasements, the work involved, both before and after the issue of the advice note for the necessary alterations to be carried into effect, is considerable.

The death of subscribers accounts for 1.77% of the actual ceasements. It may be added, however, for their comfort, that telephone subscribers as a body are a fine healthy lot of people, although one would think from the newspapers that they were being worried to death by the service. The number of telephones lost through death in a year is only .14 per hundred of the total telephones existing. Obviously, therefore, everyone with any regard for their health and future welfare should have telephone service.

Of course, many of our subscribers are companies and corporations and they, having neither a body to be kicked nor a soul to be—well—lost, don't exactly die, but they do fade away sometimes, and that brings us to bankruptcies and such gloomy subjects.

Bankruptcies account for 9.26% of the ceasements. Service given up due to bad trade and closing down branches, &c., accounts for another 8.8%. Premises given up, probably in many instances for the same reason, and no new tenant coming in in time to save the recovery of the apparatus adds 14.27% to the total. Insufficient use, state of trade again, gives us a comparatively modest 9.8%.

Circuits provided for temporary purposes vary considerably, but the average over 12 months is 5.44%.

Subscribers who have departed for pastures new represent 8.90%.

The combination of firms and interests, known these days as rationalisation, effected largely for the sake of reducing overhead charges and for economy generally, is responsible for the grouping of individual telephone installations with a reduction in the number of stations in the process, and this adds its quota to the ceasements which have to be dealt with and made good.

Strange as it may seem to those people, journalists and others, who delight in decrying the telephone service, which, incidentally, they own, the number of subscribers who leave the fold because they can stand us no longer, is infinitesimal. This must be very disappointing to those who have done their best to increase the number.

The various reasons for disposing of the service which have been mentioned account for about 86% of the total ceasements, and the balance is made up of small items such as call offices given up, Government circuits recovered, and so on.

The urgent necessity, on economic grounds, of retaining every possible station is well understood by all concerned, but sometimes it is felt that there is a misconception of the number of cases where there is a possibility of persuading subscribers to withdraw their notices. An examination of the causes for notice to cease being given shows that only in such cases as "subscriber vacated premises and new tenant will not continue to rent the service," "bad trade and to reduce expenses," "insufficient use," and one or two others of microscopic dimensions, is there any hope of retaining the station. A calculation has been made and it is found that by canvassing the subscriber in these cases approximately 26% were retained, which when all the circumstances are considered seems a fair return for our labour but still leaves a margin for the exercise of our persuasive abilities, and not being content to rest on our laurels we hope as time goes on materially to better the position, although it must be admitted that there is an undoubtedly large residuum which will never be saved and which it would be a waste of time to press too far.

W. F. T.

THE G.P.O. PLAYERS' DRAMATIC SOCIETY.

THE G.P.O. Players open their seventh season at King George's Hall, Caroline Street, Great Russell Street, W.C., on Thursday, Friday and Saturday, Oct. 10, 11 and 12. They will present Bernard Shaw's "The Devil's Disciple," preceded by "Two Gentlemen of Soho," by A. P. Herbert (of *Punch*). The former is one of the more dramatic of Mr. Shaw's plays and the latter is an amusing burlesque of modern-dress productions of Shakespeare.

The production is under the professional direction of Mr. Reginald Purdell, at present playing in "The Middle Watch" at the Shaftesbury Theatre.

Tickets, 5*s*. 9*d*., 3*s*. 6*d*. and 2*s*. 4*d*. (all reserved), are obtainable from Mr. W. L. Gartland, Room 8, Sub-Ground Floor, G.P.O. North, E.C.1, or at the Box Office before 7.30 p.m. each evening.

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THE CHARING CROSS SCHEME.

SCHEMES of town development, while of general interest to all telephone men, are of peculiar and particular interest to Contract men. Their figures, on which plant is provided, are affected by changes, growth, demolition of property, replacements, provision of new thoroughfares and traffic avenues, and generally all those movements for development which are continually going on in progressive communities. Contract men in London have, therefore, been following closely the course of events dealing with the proposed removal of Charing Cross Station to the other side of the Thames, and the erection of a new road bridge in place of the existing railway and foot bridge.

The scheme, to which I made a brief reference in an article which appeared in the *Journal* a year ago, has reached its final stage, and it is now possible to see that the changes consequent on the two operations will be of an even more momentous and far-reaching character than were originally contemplated. A few more streets will be wiped out, one or two more thoroughfares created, landmarks and properties which have stood for centuries swept away.

The principal new feature on the north side of the river which is contemplated by the final plans is the creation of a circus where the approach road from the new bridge enters the Strand. The entry of this circus into the scheme involves the disappearance of the triangular block of buildings between King William Street, Adelaide Street and that section of the Strand which faces the existing Charing Cross Station, Villiers Street and Buckingham Street. This block contains such well-known features as Coutts Bank, Gatti's Restaurant, and our own West Strand Post Office. St. Martin's-in-the-Fields, with its playground, will remain untouched, and there will be no interference with Charing Cross Hospital, which will face the north-eastern side of the new circus.

On the south side, the extended proposals are of great interest. There is no intention, so far as I can gather from the plans, to interfere with the original proposals with regard to the new station. It will occupy, roughly, the triangular site generally known as the "Lion Brewery" site, the base running parallel to the river, with a frontage of about 500 feet, and extending from the Surrey end of the new road bridge to the Surrey end of Waterloo Bridge, and the apex being at a point approximately opposite St. John's Church in Waterloo Road. One side of the new station will stretch along the west side of Waterloo Road, facing Cornwall House. The other will abut on a new viaduct and roadway which will run from the end of the new bridge, cut across York Road, skirt Waterloo Station, cross Waterloo Road a little way south of the existing railway bridge, and finally open out into a large new traffic circus at the Waterloo Road end of the New Cut.

This new roadway will sweep away the whole of Sandell Street and the mass of buildings behind the "Union Jack Club." It will probably mean the disappearance of that well-known institution. The southern end of Cornwall Road will be absorbed in the new thoroughfare, and the removal of the "Old Vic" to another site is a necessary part of the scheme. The proposed demolition of the old theatre, which has stood for over a century on its present site and possesses a tradition almost unique, has called forth spirited representations from Miss Baylis and Sir Johnston Forbes-Robertson, and it is satisfactory to know that a site in the new circus has been set apart for a new "Old Vic."

The scheme in its final form is the work of Sir Edwin Lutyens, and the engineers of the London County Council and Ministry of Transport. An agreement has been reached between the London County Council, the promoters of this scheme, and the Southern Railway Company. A Bill embodying the whole scheme will, however, have to pass through Parliament before the work can be commenced. The Bill will probably be presented to Parliament in November.

Various estimates have been made of the period which will elapse before the new bridge and station will be completed. The latest one, which may seem somewhat optimistic, made at a recent meeting of the L.C.C., is six years, and this notwithstanding that two years will be occupied in engineering preliminaries and assemblage of material.

The work will fall into four main divisions:—

(1) The new station site on the south side of the river will be cleared by the L.C.C. and handed over to the Southern Railway Company.

(2) The new station will be built, on completion of which the Company will hand over to the L.C.C. the ground covered by the old station.

(3) As soon as the first train is run into the new station, the work of demolishing the property on both sides of the river to make way for the approaches to the new bridge will be begun, and, finally.

(4) The new road bridge will be thrown across the Thames.

C. W. M.

THE RE-BIRTH OF THE TELEGRAPH.

BY F. J. LANE (CONTRACT OFFICER).

[*Supplementary Article No. II on The Telegraph Service. The Editing Committee accepts no responsibility for the views expressed in this series of articles.*]

RECENTLY a series of interesting articles from various pens have been appearing in the *Journal* on "How to Improve the Telegraph Service." I do not propose to enter the arena on this subject. I have not been invited, for one thing, and the views of a telephone Contract Officer on the telegraph service are not likely to be very valuable. This is merely what H. G. Wells might call a "fantasia of possibility": I am enthusiastic enough to call it a fantasia on probability of how the telegraph may be reborn.

It will be noticed that none of the contributors who would improve the telegraph service suggests that it can be placed on a commercially paying basis without sacrificing any of its efficiency as a cheap public service. There was, perhaps, a chance of this before the telephone entered the field, but that day has passed for the telegraph as we know it at present. In America, it is true, the telegraph still pays, but this is due to conditions (chiefly geographical ones) peculiar to vast countries. The immensity of distances slows down the postal service but has little such effect on the telegraph. We are frequently told, of course, that the American system is more efficiently managed; but we know that if all this efficiency (real or imaginary) were brought over here the telegraph still would not pay.

Yet, somehow, we do not see the telegraph going altogether. We feel that there must always be a place for it where the telephone fails to qualify.

It is noteworthy that the telephone has not seriously affected the amount of matter conveyed through the post. The post holds the field for fairly rapid conveyance of written messages at a cheap—one might say more or less nominal—flat rate. The telephone obviously fails here altogether; but I am going to suggest that the time may come when the telegraph will evade its telephone enemy and take much that at present finds its way into the mail bag.

Mr. Lowe, in last month's *Journal*, gives us a forecast of the development of photo-telegraphy which, he says, will soon be an accomplished fact. He foresees that photo-telegrams will have to be charged by space measurement instead of the number of words

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—a change which may lead to the invention of commercial codes consisting of pictorial symbols to replace the present ten-letter words. This is a most interesting speculation, but I venture to think that human material progress may render these suggested jig-saw puzzles stillborn.

With systems at present in use the transmission of any "subject" by photo-telegraphy takes an appreciable time; but based on similar principles, are being developed devices (already partially successful, we are told) having television for their object. Now an essential feature of such machines, if successful, is that the "scanning" of the "subject" must take place fast enough to complete pictures at the rate of 16 per second. Sir Oliver Lodge has suggested that the solution of this somewhat large problem will be found in the "scanning" of the subject by means of rays or electron emissions free of the limitations of mechanical devices and therefore capable of performing the operation in any desired time.

Let us modestly suppose that transmissions of photo-grams by modified television apparatus can take place at the rate of 30 per second, surely it would be ridiculous to charge the sender so much per square inch, and premises would hardly permit a charge of so much per acre! All that would be necessary would be to supply the sender with special sizes of forms and the machine would swallow reams of them far faster than a machine could cancel the stamps if the same correspondence were posted in envelopes! The messages would be accepted at a flat rate with similar broad limits at present applying to postal matter. The transmissions would be conveyed by high-frequency carrier circuits over telephone circuits—a sort of revenge for the telegraph.

We shall, perhaps, regret the wasted energy of inventors of printing telegraphs. But things like this must be in a progressive world—the "printer" killed the expert operator just as the invention of the "free-wheel" robbed us of those spectacular tournaments of messengers riding their bicycles backwards.

THE NEW "METROPOLITAN" AND "NATIONAL" STROWGER AUTOMATIC TELEPHONE EXCHANGES.

SITUATED in Wood Street, Cheapside, London, is a fine new multi-storey building which will ultimately accommodate automatic equipment serving no less than 30,000 telephone subscribers in that congested city area. The building has been designed to house "Metropolitan," "National" and "Empire" exchanges, each of 10,000 lines capacity, but at present equipment for the two first-named only is *in situ*. These were opened on Aug. 31 and Sept. 7 respectively. The opening of these exchanges will bring the total of exchanges in the Strowger system up to 17, and the latest achievement is unique as marking the partial completion of what will be the largest automatic telephone exchange in London.

Like Holborn and Bishopsgate, the first two large automatic telephone exchanges to be installed in the Greater London area, these also are Strowger Director exchanges in which calls are routed automatically to any part of the area before the wanted number is finally selected at the exchange on which the line terminates

Metropolitan has 15 director racks, and National 16. Associated with these are 1,416 "A" digit switch finders, 332 "A" digit switches, and 496 directors.

Eighty-eight trunk boards are necessary to accommodate the selectors for the two exchanges, a summary of which is as follows:—

Type of Selector.	*Number.*	
	Metropolitan.	*National.*
1st Code	1,277	1,416
2nd „	1,257	1,277
3rd „	148	158
1st Numerical	1,868	1,903
2nd „	1,606	1,668
3rd „	55	180

In addition to the above, Metropolitan Exchange is at present equipped with 1,827 and National with 1,572 final selectors.

In addition to the standard rotary lineswitch units, trunk boards and director racks, a quantity of miscellaneous equipment is also provided for the service of both exchanges, some of the more important items being as under:—

Type of Equipment.	*Number.*
C.C.I. Repeater and Coder Rotary Lineswitch Racks	18
Cordless "B" position Apparatus Racks ...	52
Semi "B" Sender Racks	4
Coder Boards	4
Miscellaneous Repeater Racks	2

Equipment associated with these racks includes 1,297 C.C.I. repeaters, 1,602 coder final rotary lineswitches, 112 coders and 104 cordless "B" senders.

Progress in the development of automatic telephone exchange equipment proceeds apace, and a novel feature has been introduced into Metropolitan and National Exchanges in the shape of single-sided racks for mounting certain items of the equipment. These racks can be erected much closer together than the ordinary length lineswitch units and trunk boards, thereby effecting material economies in floor space, making for more facile mounting and inspection of the equipment and enabling the latter to be assembled, wired and mounted in convenient self-contained units. Furthermore, the new design affords greater mechanical protection to the wiring and cabling and eliminates the ill effects of accumulation of dust.

EXTERIOR OF METROPOLITAN AND NATIONAL EXCHANGES.

In addition to performing the normal duties of routing a call and selecting the wanted number in the final exchange the Strowger selectors carry out quite a number of special duties, with the same meticulous accuracy as the mere switching through of one automatic subscriber to another, without the intervention of an operator. Thus, the trunk offering final selector will, in the event of a trunk call, single out the wanted number, whether engaged or free, and, if the former condition obtain, connect with the line and enable the trunk operator to challenge and offer the more urgent trunk call in the usual way. Again, what are known as "barred trunks" are similarly taken care of by another type of Strowger selector. This is to meet the case of P.A.B.X. lines entering the exchange from, say, a hotel or other premises where access to trunks is necessarily differentiated as between management and guests. Under this sytem a guest can dial locally from his room but can only originate a trunk call through the medium of the hotel operator, who, of course, records the call for the purpose of collecting the fee from the guest.

Then there are the P.B.X. final selectors associated with P.B.X.'s having a number of exchange lines but only one directory entry. All callers dial the one number, but the discriminating selector rapidly searches the entire available group and connects with the first disengaged junction located.

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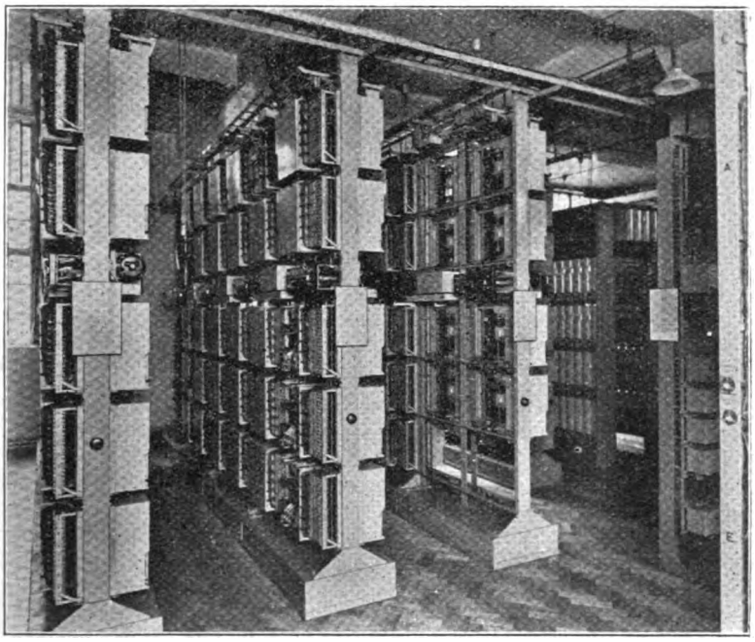
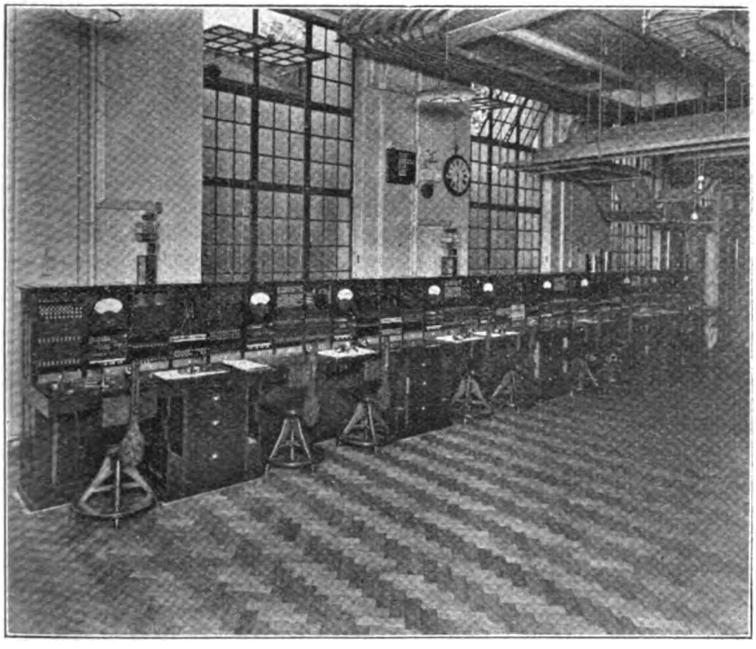
A call put through by Strowger automatic telephone exchange equipment cannot be metered until the called party responds by lifting his receiver, thereby maturing the call, registration being entirely automatic. In the event of a "wrong number" being dialled, and the distant subscriber replying the call will, of course, be registered against the caller, a just tax on carelessness



DIRECTOR RACKS, METROPOLITAN EXCHANGE.

in manipulating what is, after all, an extremely simple and efficient device, the Strowger calling dial.

A regular feature of all large Strowger automatic telephone exchanges to-day is the routiner equipment which, regularly and entirely automatically, applies a drastic series of routine tests to each and every section of the



TEST DESK, METROPOLITAN AND NATIONAL EXCHANGES.

equipment, thereby anticipating any abnormal condition and enabling it to be rectified before trouble actually occurs. So efficient is this routiner equipment in service that it is very seldom a subscriber on an automatic exchange experiences trouble on his line, inasmuch as it has been detected and remedied before it had time to prejudicially affect the service.

On the 6th and uppermost floor of the new building are accommodated the 84 special "A" and 42 semi-"B" key-sending positions for dealing with auto-manual traffic and vice versa, during the transition period, which is calculated to occupy from 15 to 20 years.

The system in vogue at Metropolitan and National Exchanges is precisely the same as at other Strowger automatic exchanges in the Greater London telephone area. Subscribers dial seven successive digits, the first three of which represent the initial three letters of the name of the wanted exchange, *e.g.*, CEN for Central, whilst the remaining four—known as the numerical digits, represent the number of the wanted subscriber whose line terminates on that exchange. The impulses set up by dialling the first three letters operate the director and are duly converted into the code representative of the exchange selected. Meanwhile the numerical impulses are stored, and, as soon as the routing process is complete pass out over the extended circuit to complete their function of selecting the required subscriber in the usual way.

The whole of the automatic equipment for Metropolitan and National Exchanges has been manufactured and installed to the order of the British Post Office by Automatic Telephone Manufacturing Company, Ltd., Strowger Works, Liverpool.

PROGRESS OF THE TELEPHONE SYSTEM.

THE total number of telephone stations in the Post Office system at July 31, 1929, was 1,794,424, representing an increase of 7,559 on the total at the end of the previous month.

The growth for the month of July is summarised below :—

	London.	*Provinces.*
Telephone Stations—		
Total at July 31	641,660	1,152,764
Net increase for month	2,776	4,783
Residence Rate Subscribers—		
Total	154,943	243,647
Net increase	835	1,362
Call Office Stations (including Kiosks)—		
Total	5,671	22,006
Net increase	24	733
Kiosks—		
Total	1,383	5,468
Net increase	30	102
Rural Party Line Stations—		
Total	—	10,490
Net increase	—	—
Rural Railway Stations connected with Exchange Systems—		
Total	17	1,156
Net increase	—	10

The total number of inland trunk calls dealt with during May (the latest statistics available) was 10,175,282, the ten million mark having been reached for the first time. Compared with May last year, the calls show an increase of 827,685, or 8.9%.

Outgoing international calls in May numbered 42,768 and incoming international calls 45,667, representing increases of 19% and 11.7% respectively over May 1928.

Further progress was made during the month of August with the development of the local exchange system. New exchanges opened included the following :—

LONDON—Metropolitan (automatic).

PROVINCES—Bramhall, Bridlington, Parkstone (automatic); Broadwindsor, Catterline, Cayton Bay, Corpach, Old Meldrum, Onich, Reepham, Rhynie, Slaidburn (all rural automatic),

and among the more important exchanges extended were :—

PROVINCES—Acocks Green, Dorking, Folkestone, Marple, Newmarket, Newquay, Oldbury, Smethwick, Wolverhampton, Yeovil.

During the month the following additions to the main underground system were completed and brought into use :—

Cross Hands—Carmarthen cable
Manchester—Preston (No. 2) cable
Preston—Blackpool (No. 2) cable

while 72 new overhead trunk circuits were completed, and 63 additional circuits were provided by means of spare wires in underground cables.

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THE POST OFFICE ENGINEER.

(*A Retrospect.*)

BY T. B. JOHNSON, M.I.E.E.

AT the end of a long period of service one is permitted (and sometimes asked) to give counsel based on experience. How should a young man of to-day prepare himself for the Post Office Engineering Service, and what qualities should he try to develop? Good technical knowledge is, of course, indispensable, but it is now generally recognised that technical knowledge is only one of the important tools a good Engineer must possess, and I need do no more than press the importance of avoiding too narrow a training. Fundamental principles must be mastered in order that they may be applied to the best advantage in various cases.

The necessity for a good training in English must be emphasised. The engineer will be subordinate to administrators and others if he does not cultivate the ability to speak and write his own language correctly and clearly. He should also be sufficiently acquainted with accounting to be able to analyse and explain the financial results of various courses of action.

An engineering supervisor must know something of economics and industrial history, and of psychology—that is, of the minds of other men. No man is a true leader whose main impulse is selfishness.

Of the utmost importance is the "balancing mind." We have to realise that no proposal combines all the advantages and none of the disadvantages, and that we have to weigh one course against another and see where the balance of advantage lies. In this way, too, we can learn to what extent previous cases can be adapted for present use, instead of following them slavishly. We must also get a balance between our work and our recreation, our interests and those of other people. Some interest outside our work must be cultivated. The administrative mind is closely allied to this. It means the power to grasp essentials, and the exercise of clear judgment on main issues. Detail is, of course, necessary for working out schemes, but clear-cut issue is the aim and attribute of sound administration.

A good maxim is "Be pessimistic in preparation but optimistic in execution." When a work is being prepared every factor should be weighed and all unfavourable circumstances considered and prepared for; but when the work has been started the time for considering alternative courses has passed, and the job must be carried out resolutely.

Experience shows more and more the need for adaptability and resource. One good test of a man is how he gets out of a difficulty. We all get into trouble at different times, but whereas some men can use initiative and resource in getting out of a difficulty, other men gaze helplessly on and wait for other people to get them out.

A supervisor must be able to inspire in his subordinates confidence in his judgment and integrity, and in his determination to give to each of his subordinates a square deal. He must also train and encourage them to have confidence in themselves. (Self-reliance is not cocksureness.) On the example of a supervisor depends the morale of the staff under his control, and upon their confidence in his straightforwardness and integrity, as well as in his judgment and ability, depends the efficiency of the District or Section or other unit.

It is of great importance that a man should get the right outlook for his job. If he looks upon it as an unpleasant necessity by which he can make a certain amount of money per week or per month, he cannot be expected to make a success of it. We must look upon our work as a vocation, and have ideals in connexion with it. As Walter Pater says:—

"We need some imaginative stimulus, some not impossible ideal, which may shape vague hope, and transform it into effective desire, to carry us year by year, without disgust, through the routine work which is so large a part of life."

We must rid ourselves of the fallacy that work is an evil and leisure an unmixed good. The working portion of an average day holds many pleasant recollections, while the leisure portion has its share of disappointments and annoyances. We should try to make the working half as pleasant as possible because of the big slice of life it represents. If we give our minds and energies to our work grudgingly and reluctantly, believing it is something unpleasant to be got through somehow, it will give no satisfaction. If we bring to it the keenness we think necessary for a favourite hobby we find all sorts of interests, and we frequently experience the pleasant feeling of having done something really well. An electrical engineer can find interest, stimulus, and even adventure in his work if he gives his mind to it.

Another important factor (of which a good deal has been heard lately in connexion with appraisement schedules) is tact. What is tact? One definition is "that admirable quality which we ourselves possess, and which the other fellow lacks," but we need not accept so cynical a definition as this! A better one is "Nice perception, especially in seeing exactly what to do and say in given circumstances," but the definition I prefer is that of "sympathetic insight." In order to be tactful a man has to read the other man's mind, and interpret this knowledge with sympathetic consideration. It has been said that every man suffers from "liver," if not his own, then another's. We ought to see that our own does not cause unhappiness to those among whom we live and work.

When all has been said regarding ability, capacity, knowledge, and experience, there is still another factor which is sometimes called "luck." Lord Derby, for instance, said that to win the Derby an owner needed the best horse, the best jockey, and the best luck. I do not like this term "luck," and would sooner say "opportunity." One can readily recall cases in which some people seem to have had opportunities for getting on which did not present themselves to other people equally well fitted. Even "opportunity" does not seem to cover the whole ground, and the term "circumstances" is probably better still. Abraham Lincoln said "I can control men but not circumstances," and cases have occurred in which some men appear to have had favourable circumstances ready to hand, and opportunities waiting for them; while for other people, who were as well or even better fitted, the circumstances seem to have been adverse, and in spite of what they have tried to do, promotion has not come with the same readiness. There must, however, be the capacity to take advantage of opportunities when they occur.

Some counsel given over 2,500 years ago may well be considered by supervisors and other people in authority to-day: "What is required of thee is to do justly, and to love mercy, and to walk humbly with God." To do justly, that is, justly towards the Department whose salt we eat, and also to the staff with whom we work. To be loyal both to the Department and those under our control. Mercy does not mean weakness or laxity of discipline. Some men think they are merciful when they are simply showing they have not the strength to be firm in an unpleasant position, and they can make a decision in advance involving some amount of hardship to other people, which, when the time comes, they have not the courage to carry out. To walk humbly—that is not to have a high opinion of one's self; but it does not mean we are not to have a high opinion of our job. A high opinion of one's work makes one inclined to be humble, while a high opinion of one's self makes one swelled-headed and conceited.

In the recent report of the Committee dealing with the conduct of Civil Servants it was laid down that "The public expects from Civil Servants a standard of integrity and conduct not only inflexible but fastidious, and has not been disappointed in the past. We are

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confident that we are expressing the view of the Service when we say that the public have a right to expect that standard, and that it is the duty of the Service to see that the expectation is fulfilled." This principle has been handed down to us as a tradition, and it behoves every one of us to see that in his own sphere, however small or large it may be, that tradition is faithfully followed, and handed on to those who succeed him.

I am glad to have been a Post Office Electrical Engineer. I have always been a firm believer in the Post Office Engineering Department as a career, and believe in it as strongly now as ever. It gives plenty of hard work, heavy responsibility, not so much pay as other people get; but in addition to some valuable material advantages, such as liberal annual leave, pension, &c., it also gives work with a great deal of interest and variety, opportunities for service to the community, and the consciousness that one is, in some degree, increasing the comfort and helping forward the progress of mankind.

THE JUBILEE OF THE TELEPHONE EXCHANGE SYSTEM.

We may take it as being fairly certain that this is the jubilee year of the exchange telephone system in Liverpool, and most probably in the United Kingdom.

It is somewhat extraordinary that a system of exchange telephony which was destined to have such an effect on the commercial and domestic life of the world should apparently have received such scant notice at the time, as there is very little reliable information as to when the first telephone exchange was actually opened in this country. There does not appear to have been any flourish of trumpets or waving of flags, banquets or speeches to herald what was to become one of the greatest utility services of the century.

The first telephone exchanges were purely local and provided only for connecting one subscriber to another on the same exchange. Before long, however, lines connecting exchanges in various adjacent towns came into being and gradually spread farther afield to distant towns in the United Kingdom, and eventually to the Continent, and recently, by means of wireless, to America.

The number of calls passing from subscriber to subscriber in this country alone in the course of a year amount to something like one thousand six hundred millions. The first through switching apparatus was of a very crude nature, the calling apparatus being on one board and the connecting cords on another, requiring two or more operators to handle one local call.

The lines were single, with an earth return, and, of course, entirely overhead. Then followed the double or return wire system and later underground cables. The single switchboard was superseded by the multiple board by which one operator could connect a subscriber to any one other subscriber on the same exchange without moving from her position. Central battery working followed magneto, and automatic is now replacing all other systems, slowly, perhaps, but none the less surely.

Wires are still generally a necessity, but wireless has already been brought into place for transatlantic speaking, and who can visialise what will happen in the next 50 years if the same rate of progress is maintained.

The most remarkable fact, perhaps, is that throughout, the telephone receiver, which was the invention that gave us the telephone system, has remained practically the same in its construction and varied little in its form, the only variation being the substitution of the double pole for the single pole magnet under the diaphragm, a wonderful testimony to the thoroughness of Graham Bell's invention.

The telephone is no longer a toy, it is no longer a luxury, it is a necessity.

W. E. Gauntlett.

SUMMARY OF EVIDENCE AS TO THE FIRST TELEPHONE EXCHANGE IN EUROPE.

The records of the electrical press for the latter half of 1879 have been investigated, and while they go far to confirm the claim of 36 Coleman Street to be the first exchange, they leave room for an element of doubt. The evidence is somewhat contradictory and requires weighing with judicial care. For example, the *Electrician* reprints letters addressed to the *Times* in August 1879 by Mr. G. H. Chubb, and the replies of the Telephone Companies. Mr. G. H. Chubb (now Lord Hayter) asks, on Aug. 19, "how much longer it will be before this most useful arrangement is established in London." On Aug. 20 the Edison Company reply to the effect that they are now erecting an exchange, and the Telephone Company Limited say that progress is being made but they are experiencing difficulty in obtaining instruments. Nevertheless on the 21st Mr. Chubb writes again saying that he is "pleased to find that one company has actually got it at work. By the courtesy of Captain Horne and Mr. Ormiston, of the Telephony Company, Limited, I have to-day seen the whole of their arrangements and can testify to the perfect ease and simplicity in speaking through the central office to anyone who has a telephone in communication." It would therefore seem that the Telephone Company had a small number of subscribers working at that date, but was unable to develop further at the moment for lack of satisfactory instruments. Lord Hayter, whose firm is given in Mr. Baldwin's list (quoted in the *Journal* last month) of those who were "amongst the first subscribers" apparently lost no time in becoming one, for he recently stated to the *Daily Express* that Chubb & Sons were "No. 9."

We now turn to the *Telegraphic Journal*, the forerunner of the *Electrical Review*. This was a fortnightly paper, and it is of course impossible to decide how many days before publication small items of news concerning the telephone were written. On Sept. 1 they say "the Telephone Company are *about to introduce* Bell's telephone into London on the exchange system"; and on Sept. 15 in an editorial: "The Bell Telephone Company have turned their Coleman Street office into a central exchange for the city. Other stations are likely to open soon in the Metropolis, and other towns, notably Manchester, are arranging to have exchanges." Further on, the same article adds, "and *at last* a telephone on the Edisonian model has been opened at No. 6 Lombard Street and a number of subscribers gained." We know from the record of the *Times* (*vide* last month's *Journal*) that the Edison Company's exchange was opened with 10 subscribers on the 6th; but apart from the testimony of Mr. Chubb's letter that the Telephone Company, Limited, had "actually got it at work," the wording of the editorial seems to confirm the view that the Edison Company's exchange was the later of the two. The opinion may be hazarded that whatever sort of exchange the Telephone Company had working on Aug. 21 (whether experimental, confined to officials and directors, or what not), some time at the beginning of September they extended the service to the general public. At any rate, when Messrs. Graves and Preece inspected 36 Coleman Street on behalf of the Post Office on Nov. 7, they reported that the Telephone Company had 52 or 53 subscribers, and Mr. Preece added that the Edison Company had (even at that date) only 10 wires connected with their central station, "and we cannot find that they have any *bona fide* subscribers." (These interesting reports were reprinted in the *Telegraph and Telephone Journal* for July 1916.)

The *Telegraphic Journal* of Oct. 15 reports that the Bell Company (i.e. the Telephone Company, Limited), had 50 subscribers in London, 80 in Manchester, and 40 in Liverpool, and in their Dec. 1 issue they credit the Telephone Company with 150 subscribers and 3 exchanges in London. (A circular dated Dec. 24 gives the names of about 200 subscribers.)

Despite Mr. Preece's disparaging remarks about the Edison Company, the fact remains that they had 2 more exchanges working

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in London before the end of 1879 (their principal exchange was transferred from Lombard Street to 11 Queen Victoria Street in the middle of September); and a list dated Feb. 20, 1880, contains the names of 180 subscribers (*vide* "The Telephone and Telegraph Exchange," by Mr. J. E. Kingsbury).

The evidence at our disposal seems to show that the Telephone Company had an exchange of some sort (whether public or not) working in the middle of August and that it was more or less opened or extended to the public at the beginning of September; that the Edison Company had 10 lines working at Lombard Street on Sept. 6 whose possessors, however, Mr. Preece describes as "not *bona fide* subscribers"; and that the first-named company had 200 subscribers by Christmas and the second 170 by the following February. They were amalgamated in the summer of 1880 as the United Telephone Company.

The Faulkner Street Exchange, Manchester, once claimed by Mr. Lorimer as the pioneer exchange in England, is shown by the *Manchester City News* of Sept. 13, 1879 (and also by the *Electrician* quoted above) as about to be opened in the middle of September.

The position of Glasgow is more obscure. Mr. Graham claimed to have a medical and legal exchange working in March 1879. The late Mr. A. R. Bennett (who joined Mr. Graham in January, 1881) disputed these claims and suggested that the date was a mistake for March 1880. Finally he produced evidence from the *Electrician* of Dec. 20, 1879, as follows:—"Glasgow has now three rival telephone exchange companies—Scottish Telephone Exchange Company, Edison Company, and the Telephone Company (Bell's). Besides these Mr. Graham, a telegraph engineer of the city, is prepared to establish private lines." In October, 1880, the same paper reports that "Graham's exchange is now working against the powerful rivalry of the United Company (Bell and Edison)." Mr. Bennett adds that the Scottish Telephone Exchange Company never got properly to work in Glasgow. Lastly, Mr. Adam Scott claims to have erected what he calls an exchange connecting the offices of Smith & Son, wool brokers, Glasgow, with two other offices with which they were interested, and to have made their office a kind of central office, so arranged that intercommunication could be obtained. He explains that he could get no further until he had obtained a licence from the Bell Company. He then proceeded, and states that "in this way Glasgow telephone exchanges were formed at least 5 months before the opening of the small London exchanges." These, however, seemed to have been what are known as "A to B" private lines with intercommunication. They are hardly exchanges in the ordinary sense of the word and were evidently not so regarded by the writer in the *Electrician*, who does not include them in the 3 exchange systems working in Glasgow in December, 1879.*

After considering all these data, it seems fairly conclusive that the Coleman Street exchange (which was certainly connecting up members of the public as subscribers early in September, 1879, and which by the beginning of November had 52 or 55 subscribers working, whilst the Edison Company, which started work on Sept. 6 with 10 subscribers, had still only 10 subscribers in November), has a good claim to be considered the first *bona fide* public telephone exchange in Europe. It looks as though the Edison Company with their 10 subscribers (whom Mr. Preece, for reasons which we do not now know, did consider *bona fide*) made a desperate effort to open first. They *may* have announced a public opening of their exchange on Sept. 6 before the Telephone Company, Limited made a public announcement of opening, but it cannot be considered that their service to 10 subscribers has any greater claim to be considered a "public service" than that rendered by the Telephone Company on Aug. 21, when Mr. Chubb saw the Coleman Street exchange working.

W. H. GUNSTON.

* Mr. Scott, in an interview with a *Star* reporter, also claims to have had a medical, legal, and commercial exchange working in Glasgow before London possessed one. It would seem either that Mr. Scott was associated with Graham or else that Glasgow positively teemed with "exchanges" in the year 1879.

THE FINE ARTS AND THE THREE SERVICES OF THE POST OFFICE.

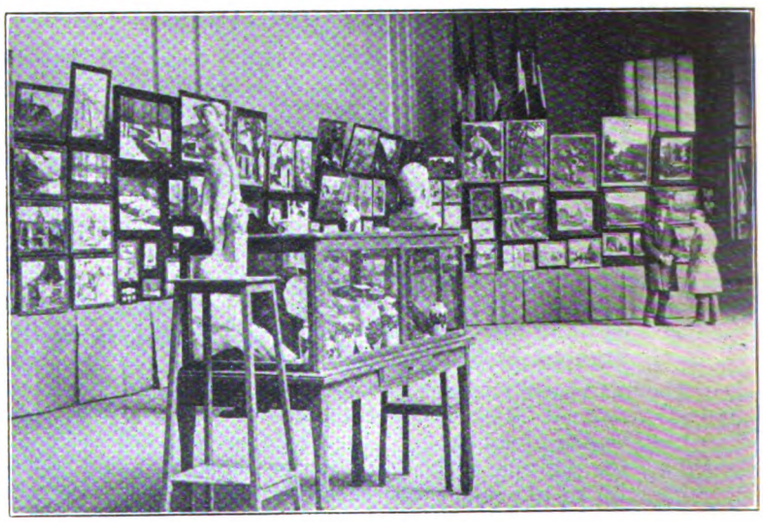
THE necessity for some diversion from the strain of one's normal trade, occupation or profession is to-day more fully recognised than hitherto. At one time, and that not so very long ago, it was argued in certain quarters that if men and women had too much leisure they would get into mischief—therefore it was good for them to work long hours!

In any case, to-day, whatever lessening of the hours of labour may have accrued to Government Postal, Telegraph and Telephone officials of either sex and in any country, the time thus available for the independent use of the individual, has, with the exception of but a microscopical percentage, been healthfully and usefully employed in recreation of all kinds, be it physical or mental.

Our own British Post Office is an excellent example of this condition of affairs of which the service papers periodically give due evidence.

Similar happy tendencies are to be noted elsewhere, and the occasion of the 17th Art Exhibition of our colleagues of the French Posts, Telegraphs and Telephones, has given our readers the opportunity of a glimpse of the use of leisure on the artistic side the other side of the Manche.

Thanks to the kind permission of M. Reculon Dupont and to the skill of our Parisian colleague, M. Foulon, no less than to the courtesy of M. Petro Filliatre, editor of *La Interligilo de l'P.T.T.*, who has loaned the original photograph, we are able to reproduce an excellent picture of a corner of "The 17th *Salon* of our Paris colleagues."



There were no less than 500 entries and the exhibits were the work of all ranks, from Director to postman. The French colonies and the provincial offices were also contributors, a surprising fact and one which, some day, one may hope will be possible in connexion with British colonies. If Australian, Canadian and New Zealand scouts can reach our shores, there should not be any insurmountable difficulties in arranging for an exchange of a few pictures, &c.

Official recognition was given to the extent of the opening of the exhibition by the present Secretary of State for the P.T. and T., M. Germain Martin, who himself visited every part of the Salon, and became so interested that he purchased two beautiful aquarelles.

A critic informs me that "nothing but the warmest congratulations can be offered to the exhibitors for their clever paintings,

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their rich colourings and their evident love for and striving towards the beautiful."

The exhibits comprised sculptures, pottery, miniatures, oils and aquarelles, pastels and designs, photos and stereophotos, &c. These presented every aspect of nature, landscape and rocks, trees, water, snow, flowers, animals, urban scenes, villages, harbours, field scenes and scenes of family life, still life and the nude.

The manner of treatment was equally diverse: classic, cubist and impressionist being fully represented.

Not only the purely artistic but the practical was in evidence. A postman exhibited a design for the semi-official calender, while another official of the same rank showed one for a pocket calendar.

The women were well to the fore with what are described by a writer in the Esperanto organ as "remarkable productions of painting on velvet, ornamental embroidery for clothing or for decoration of the home."

The works of musical composers and authors were not omitted, one is glad to note.

During the opening, music was provided by the P.T.T. Orchestra, which it is hoped gave the visitors at least one or two examples of their colleagues' originality in rhythmic beauty. Shall we say in Baudot cadence?

J. J. T.

TELEGRAPHIC MEMORABILIA.

TELEVISION has made yet another step forward since our last issue in that the Baird Television Development Company accepted a new offer from the B.B.C., and will begin broadcasting shortly, probably this month, from B.B.C. stations, outside the regular programme hours.

Nightly transmissions are also soon to be made from the Brussels station of the company. The time of these transmissions, it is understood, will be from 10.30 to 11.30. Both the British and Belgian transmissions will be made on experimental lines. Captain Hutchinson is very confident of success, according to a statement made to the radio correspondent of the *Daily Telegraph*.

A Television Society, similar to that established in this country about eighteen months ago, has been inaugurated in France, under the presidency of M. E. Belin, and is to be known as *L'Association Française de Télévision*, with headquarters at 5, Rue Malakoff, Paris.

Picture telegraphy has made a very definite move forward "down under." On the 9th of last month a telegraph picture service was opened between Sydney and Melbourne by means of the normal telegraph circuits. A picture telegraph service has also been established between Germany and Sweden.

Amalgamated Wireless (Australia), Ltd., has concluded a five years' contract for a still-picture service with the agents of the Fultograph system, according to *The Electrical Review*.

An amateur has come to the front in solving a problem in connexion with fixing Fultograph pictures which has puzzled scientists for some time past. The *Electrician* states that Dr. A. J. H. Iles, of Taunton, discovered that if the picture "be laid face downwards in a solution of alum and ordinary tap water, the picture then becomes as permanent as a fixed photographic plate or print." It's so simple!

Wireless on Trains and Omnibuses.—The French State Railways have decided to install broadcast wireless apparatus on certain trains, apparently following on experiments already mentioned in the *T. and T. Journal*. The *Morning Post* informs us that the service will commence from the present month between Havre and Paris. Headphones are to be provided.

A correspondent of the same London daily also reports that wireless is also to be provided very shortly on Berlin omnibuses which travel out into the country, as a counter-attraction to the steamers on the surrounding lakes of the German capital, which carry brass bands on board and are very popular!

Items in Brief.—The Irish Free State Radio Exhibition opens at the Mansion House, Dublin, on the 26th inst.

The annual Belgian Radio Exhibition will also take place in Brussels as usual.

The new Central Telegraph Office in Moscow was opened on Aug. 30. The building was designed and erected in two years by Soviet engineers at a cost of ten million roubles, says Reuter's agency.

The Western Union's new telegraph office in New York is also well on the way to completion. It is to be 370 ft. high, no less than 19 shades of brick are being used to make the building an artistic success. The estimated cost of erection is $14,000,000.

Japan is considering the advisability of transferring the telephone service to private management. *Per contra*, the Prime Minister of New Zealand says it is regrettable that the British Government should have relinquished its paramount interest in the Beam system!

Personal.—The heartiest congratulations of many old friends and colleagues will surely follow the promotion of Mr. H. Booker to Asst. Traffic Inspector, Class I, a promotion due solely to a dogged, studious character, never content with less than the best he can give.

Work.—Man cannot live by work alone. He must have his work crowned with comradeship.—*Warwick Deeping.*

J. J. T.

REVIEW.

"The Universe Around Us," by Sir James Jeans, F.R.S. Published by the Cambridge University Press. x + 352 pp. Price 12s. 6d. net.

Last year Sir James Jeans published a monumental and critical work on "Astronomy and Cosmogony." In this book, although the results of the various lines of research dealt with were summarised at the end of each chapter in such a manner that their general outline could be understood by the non-mathematical reader, yet, in view of the nature of the subject and its critical treatment, it was necessary for the greater portion of the volume to be devoted to very abstruse mathematical investigations. The subject is, however, of extraordinary interest, wonderful discoveries are being made almost daily, and it is good for the man in the street to have some idea, at any rate, of the developments which are taking place. The general reader will, therefore, welcome the volume now under review. The ground covered is, in general, that of the volume just referred to, but the method of treatment is essentially non-mathematical and popular.

After a brief historical introduction, Sir James deals, in six chapters, with the latest discoveries in the distribution of the heavenly bodies, the structure of the stars and of atoms—for it has been discovered that a knowledge of the structure of the atom can throw a flood of light on the structure and functioning of the stars, the enormous vistas of time comprised in the past and future history of the universe which have been opened to us by modern research, and the story of the birth, life and death of the stars.

The whole book is written in a most fascinating style, and should appeal to a wide circle of readers. It is illustrated by 22 plates showing beautifully reproduced astronomical photographs and by two plates showing photographs of the tracks of the alpha and beta particles resulting from the disruption of atoms, together with 23 well-reproduced diagrams in the text.

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View of Strowger Automatic equipment at the Marunouchi Office, Tokyo, Japan. Note the excellent construction of the building which is fire-proof and earthquake-proof, with high ceilings and unusual provisions for light and ventilation.

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STROWGER

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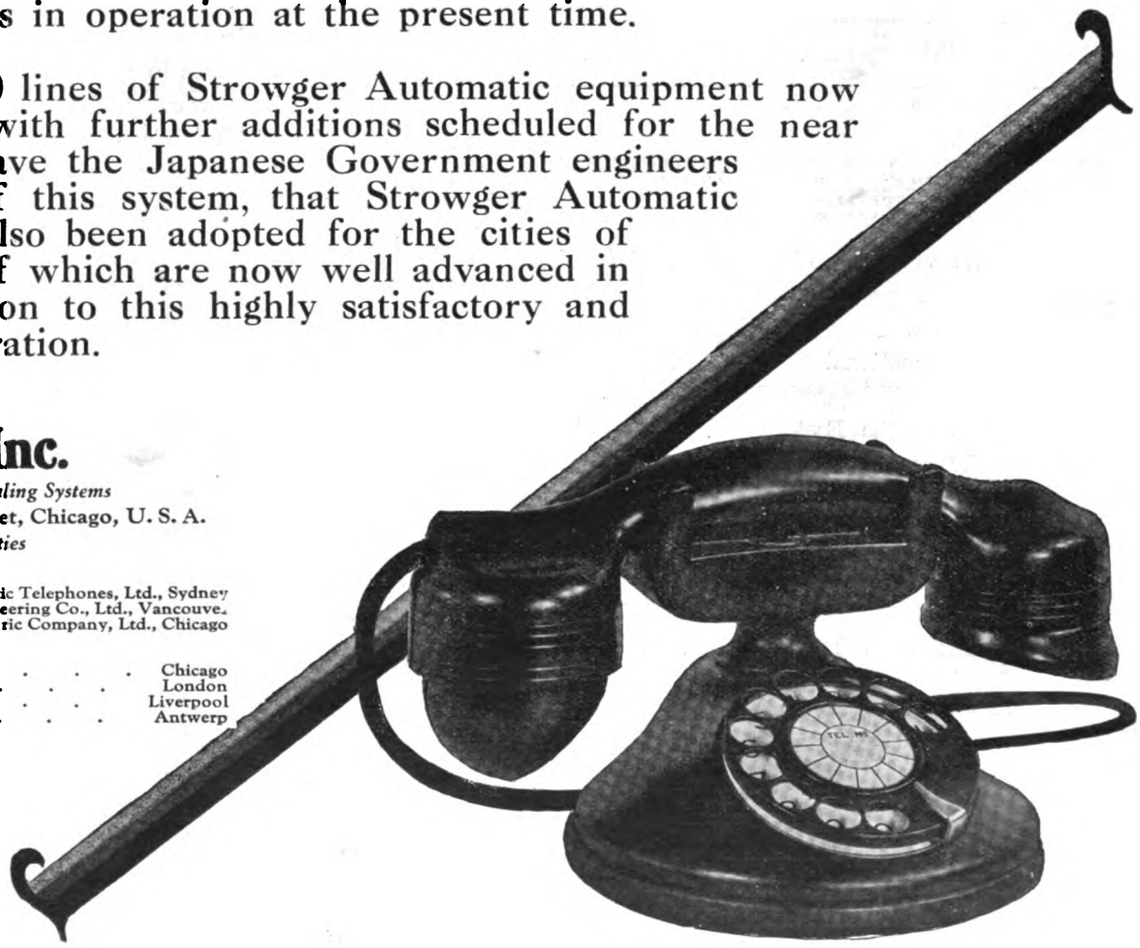
ɣger Automatic Brings Modern Service to Tokyo.

LATING its first definite plans for the conversion of the city of to Strowger Automatic operation immediately following the disastrous uake of 1923, the Japanese Government placed the first Strowger lephone exchange for Tokyo in operation in 1925. So rapid have been ade in the carrying out of this noteworthy project, that today there are in Tokyo eleven Strowger Automatic offices rendering the highest type o more than 48,000 telephones, which comprise approximately 50% of nber of stations in operation at the present time.

there are 7,000 lines of Strowger Automatic equipment now ed in Tokyo, with further additions scheduled for the near well pleased have the Japanese Government engineers ne operation of this system, that Strowger Automatic uipment has also been adopted for the cities of Nagoya, both of which are now well advanced in ns of conversion to this highly satisfactory and nethod of operation.



tic Electric Inc.

ger Dial Telephone and Signaling Systems
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The
Telegraph and Telephone Journal.

PUBLISHED MONTHLY IN THE INTERESTS OF THE TELEGRAPH AND TELEPHONE SERVICE, UNDER THE PATRONAGE OF THE POSTMASTER-GENERAL.

Editing and Organising Committee - - - Lieut.-Col. A. A. JAYNE. J. STUART JONES. W. D. SHARP. J. F. STIRLING. J. W. WISSENDEN.

Managing Editor - - W. H. GUNSTON.

NOTICES.

As the object of the JOURNAL *is the interchange of information on all subjects affecting the Telegraph and Telephone Service, the Managing Editor will be glad to consider contributions, and all communications together with photographs, diagrams, or other illustrations, should be addressed to him at the G.P.O. North, London, E.C.*1. *The Managing Editor will not be responsible for any manuscripts which he finds himself unable to use, but he will take the utmost care to return such manuscripts as promptly as possible. Photographs illustrating accepted articles will be returned if desired.*

VOL. XVI. OCTOBER, 1929. No. 175.

THE IMPERIAL CABLE AND WIRELESS SERVICES.

BY the time these lines appear in print, the Imperial Cables and the four Beam services will probably have been moved from the Central Telegraph Office, and will henceforth be under the sole control of Imperial & International Communications, Limited. For a time the Imperial Cables will be worked from Electra House, Moorgate, the headquarters of the Eastern Company, and the Beams from Radio House, Wilson Street, the main telegraph office of the Marconi Company. At a later date the services will meet again at the new headquarters of the Communications Company, which are now being built on the Embankment.

This *Journal*, by reason of its habitual modesty and discretion, has done much less than justice to the Beam services, which may be described without exaggeration as the most important development in the history of telegraphy during the present century. In the early days of Beam working the system was untried, and a large staff had to be specially trained to adapt their methods to the peculiarities of the new system. In these circumstances it was premature to boast. When the Beams had begun to establish themselves in the public confidence, the shadow of the Imperial Conference loomed on the horizon; and although the daily press was full of rumours of what the Conference were likely to decide and the shares of the Eastern & Marconi Companies 'soared' in consequence, it behoved us to keep silence until the report of the Conference was published. A summary of that report will be found in our issue of August, 1928; and at last, after long and complicated negotiations, the recommendations of the Conference have fully taken effect.

Let us examine briefly in retrospect the Post Office working of the Beam services. (Considerations of space alone compel us to crowd out the less spectacular but hardly less significant history of the Imperial Cables.) First of all from the taxpayers' point of view. The capital cost involved to the Exchequer in the four Beam services in this country was about £242,000. In the first complete year since their inception, the working-profit gained by the Post Office amounted to no less than £166,000; and the present profits are still higher. The financial exploitation of a new invention is strewn with pitfalls, as investors in many new companies have found to their cost; and the result in this case is a record of sound financial administration of which we may be reasonably proud.

Next from the point of view of the "consumer." Mainly as a result of the insistence of the British Post Office, it was decided at the outset to fix the main rates on the Australian, Indian, and South African services at two-thirds of the cable-rates then in force; and on the Canadian service, where it was not found possible to reduce the rates generally, a special service of "post letter telegrams" was introduced at the unprecedentedly low rate of half-a-crown for a message of twenty words to any part of Canada. Immediately before the Beam services to Australia, South Africa, and India were opened, the cable-rates to those countries were also reduced in order to meet the new competition. These solid gains have been secured to the British public, not only by reason of the invention of the Beams, but also to no small extent by virtue of the fact that the Beam services in this country were controlled by the Post Office.

As regards the confidence of the public, the traffic speaks for itself. If we contrast the first complete week of each service with a week in November last, chosen at random (the latest comparison that has been published), we find that on the Canadian Beam the traffic increased from 59,000 to 113,000 paid words; on the Australian Beam from 53,000 to 181,000; on the Indian Beam from 115,000 to 253,000; on the South African Beam from 88,000 to 200,000. The proportion of full-rate traffic to the whole is about 50%. It is clear that the business-community is not only making use of the Beam services but is ready to entrust them with its code-traffic, for which speed and accuracy is essential.

As regards the staff, the operating and engineering staff directly concerned in the working of the services have been given an opportunity of transferring to the Communications Company. Some have decided to avail themselves of this opportunity; the majority, as far as is known at present, have preferred to remain with the Post Office. But whether they go or stay, they will not lightly forget their experiences of the last two years. They worked at concert-pitch, in the full limelight of criticism; and they made a good show. The services established a sound tradition; and it is to be hoped that even though the services are lost, the tradition will remain. On the remainder of the telegraph service there is not the same incentive of novelty and competition; but on the

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other hand a monopoly imposes an obligation, and the public have no less right to a first-rate service because they have no opportunities of transferring their custom elsewhere.

We trust, therefore, that the telegraph service will profit by the association of the Beams with the Post Office, not only by the annual rent of £250,000, but in other less material ways. There is some hope at any rate that the publicity organisation (commonly known as "canvassing"), to which the Imperial Cable and wireless services owed so much, will be retained; and the operators who were trained to give a service of high quality to Melbourne, Bombay, Cape Town, and Montreal will not be content with an inferior service to Manchester or Paris. We had built up high hopes of the Imperial services, and it is with real regret that we hand them over; but we wish every success to the Communications Company in this extension of their activities. We are specially sorry that the team of operators at the C.T.O. will have to be disbanded; both to those who leave us and to those who remain we extend our sincere congratulations on the past and our cordial wishes for the future.

HIC ET UBIQUE.

SEVERAL developments of the international telephone service took place in September. Indeed, the month that goes by without witnessing some extension is in the nature of an exception. On the 1st the transatlantic service was extended to Moose Jaw and Saskatoon, in Canada, and on the 18th to Turin and Genoa, in Italy. On Sept. 10 arrangements were put in force for keeping the transatlantic service open during the whole 24 hours of the day. Finally, the London-Warsaw service was extended to several of the chief towns in Poland, including Krakow and Posnan (better known in this country as Cracow and Posen).

Oct. 1 will see the extension of the "Personal Call" system to the Anglo-Continental telephone services (except in that with Switzerland). The additional charge ("personal charge") for a personal call to the Continent—which is the same whatever the duration of the call—is one-third of the unit (3-minute) charge, for a call to the Continental town concerned.

Whilst in London the City is in contention with the West End as to its superiority in the manipulation of the dial, Northerners are permitting themselves to crow over the South concerning the entirely successful introduction of automatic working into their cities. Says the *North-Eastern Daily Gazette*:—

"Perhaps the enervating atmosphere of the South will be held up as their excuse. Or it may be suggested that the industrial North should be expected to grasp mechanical details more quickly. No self-respecting Southerner will admit that the North stimulates a spirit of inquiry and self-reliance that makes its inhabitants delight in conquering difficulties, even simple ones like dial telephones. They will continue to deny our claim to superior native ability, even as they fuss helplessly about with almost fool-proof gadgets."

The *Yorkshire Post* adds:—

"Though it is only to be expected that it will take London longer to learn the manipulation of the dial than it took us sharp ones in the North. Already there it has produced a revolution in the attitude towards the telephone girl. Now they are losing her they realise how much they love her.

The problem of deciding which was the first exchange in this country still exercises the minds of newspaper contributors. The fact that Mr. Bernard Shaw once worked in the Edison Company's offices at Queen Victoria Street (he tells the story himself in the preface to "The Irrational Knot") seems to influence one of the lighter paragraphs in favour of the Edison exchange. And really, this seems to us as good a reason as any which have been brought forward.

Mr. W. W. Cook, well-known to many of our readers as the Assistant Engineer-in-Chief of the old National Telephone Company, is relinquishing his practice as consulting engineer. The firm of W. W. Cook & Partners dissolved partnership on Sept. 30, Mr. Cook retiring, and Mr. Pook joining the International Telephone and Telegraph Corporation.

J. F. STIRLING.

THE Telephone Service loses one of its outstanding personalities by the retirement of Mr. Stirling from the post of Assistant Controller, London Telephone Service. Stirling is well known to his telephone and telegraph friends, and his early career has already been described in the pages of the old *National Telephone Journal*. It may be of interest, however, to recall here some incidents in his long and varied experience. He joined the Telephone Service in 1883 and soon came to the forefront. After service at Dundee and Sheffield and as Local Manager at Hastings, he became District Manager at Ipswich in 1901. Subsequently he became District Manager at Chester and at Portsmouth. In 1907 he came to London to join Colonel Clay's staff in the Metropolitan District as Chief Accountant. In that capacity he did much to build up the London system. His extensive knowledge of the National Telephone Company's business was of great use in facilitating the co-ordination of the company's and the Post Office systems when the company's business was taken over by the Post Office in 1912.

Since July, 1913, Stirling has been Assistant Controller in charge of the Accounts Branch of the London Telephone Service, and he has devoted himself wholeheartedly to the task of improving the accounting methods to meet the rapid development of business, always with a keen eye to efficiency and economy.

Quick and sound in his judgment, and with long and varied experience in telephone matters, his views have always been highly valued by his colleagues, and he has achieved a reputation for thoroughness in connexion with whatever he took in hand.

He did not confine his service interests solely to the official work of the Department. At all times he showed keen interest in the various staff activities outside the office. In the earlier days he gave much time and thought to the formation of the telephone societies both in the Provinces and in London.

He has taken a leading part in connexion with the various schemes for encouraging the further education of the staff, and has served as Chairman of the Advisory Committee of the City Literary Evening Institute of the London County Council. As many of his colleagues know, he has, in addition, been prominently associated with the work of the Hospital Saturday Fund. He has also served on the Editorial Committee of this Journal, frequently contributing to its pages and seeking always new methods and matter which would increase the Journal's attractiveness to the staff.

By Stirling's retirement we lose an able and energetic colleague, to whom we in the London Telephone Service tender our good wishes for the future.

W. N.

[We are sorry not to be able to reproduce a photograph of Mr. Stirling, but his colleagues on the Committee have been unable on more than one occasion to obtain by persuasion or pressure the necessary print.—ED., *T. & T.J.*]

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IS A TYPEWRITER-TELEGRAPH-TELEPHONE SERVICE IN SIGHT?

By J. J. T.

THE *Wall Street Journal*, of New York, in its issue of a few weeks back, declares that the Bell system has developed such a system as could be described in the above title, by means of which subscribers would be able "to handle their own messages, telephone or telegraph, in their own way."

As constant readers of our own telegraph and telephone literature in this country are well aware, the idea is by no means a new one, at least as modern progress is measured. It is actually a matter of years since Donald Murray adumbrated the future possibility of the telegraph-cum-typewriter exchange.

The Bell engineers appear to have given to the typewriter something very near to the flexibility of the telephone by their latest developments in connexion with their own telephone system.

It has been found possible to construct switchboards by means of which "telephone-typewriter" subscribers can be inter-connected with the same ease as is at present the case with the ordinary telephone.

The system has been so far developed that the company will apparently soon be in a position actually to install the necessary supplementary apparatus in any American city.

Already experimental services have been established in New York, Boston and Chicago, and a few smaller cities, by means of which the actual traffic of the day is being dealt with.

"When placing the call," says my informant, "the subscriber switches on the necessary power"—an operation of the simple order of raising a telephone receiver—"which lights the subscriber's line-lamp at the switchboard, whereupon the operator responds by connecting his special typewriter to the calling subscriber's line and typing the letters, say, NY OPR. The calling subscriber then types the station required and awaits "G" from the called subscriber, or suitable information if the connexion cannot be completed."

The experimental stage has not been finally reached, but he would be a rank pessimist who would deny the possibility of permanency to these developments in telephone-telegraphy.

So far as the U.S.A. is concerned, these same developments open up an interesting vista of competition with the purely telegraph interests of that country. It is true that, "so far the American Telephone and Telegraph Company has concentrated its efforts entirely on the telephone and has contented itself with leasing its facilities for telegraph purposes," but given continued success of the scheme one cannot believe that matters will remain quiescent for very long!

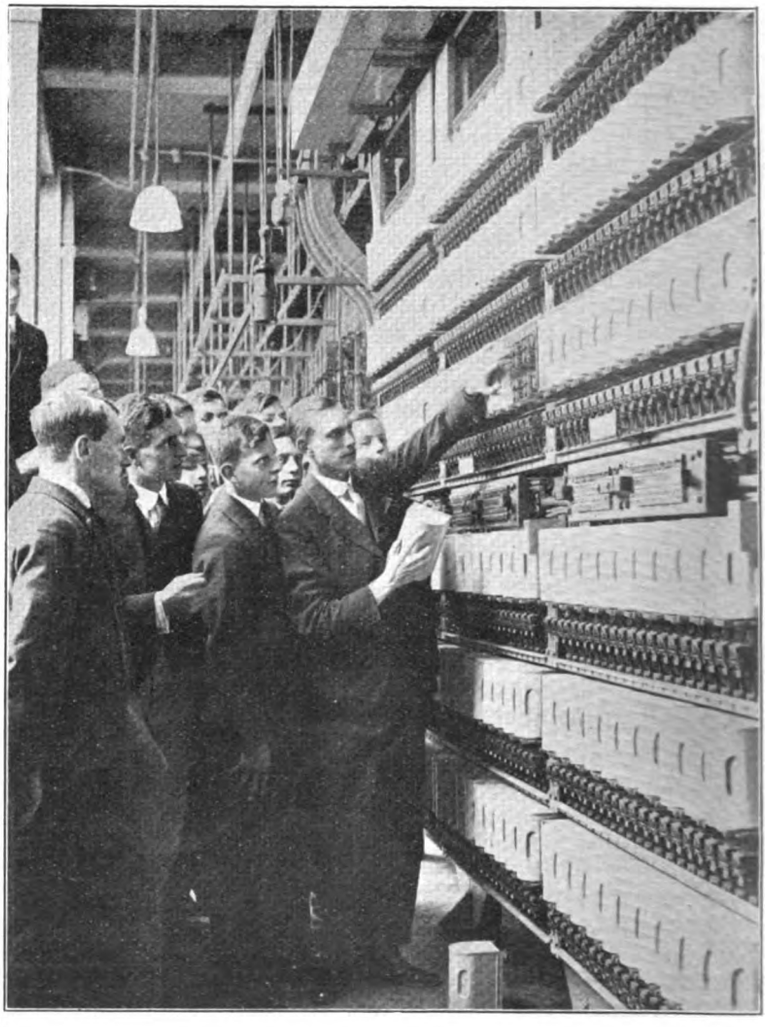
INTELLIGENT ANTICIPATION.

WELLINGTON COLLEGE SCIENCE CLUB VISIT TO HOLBORN AUTOMATIC EXCHANGE.

THE Telephone Development Association recently adopted the policy of encouraging the senior boys of the colleges and schools of England to see at first hand the difficulties, uses and inner workings of the telephone service, and marked the initiation of this policy by a luncheon given on July 2 at Gatti's Restaurant, Strand, London, W.C., to 22 members of the "Science Club" and to the Holborn Superintendent, the Press being represented. In keeping with the nature of the function the excellent menu included :—

Saumon froid, Sauce Téléphone.
Salade Wellington, and
Fraises à la Crême Automatic.

The Chairman, Mr. Powell-Jones (Secretary of the T.D.A.), made a short, concise speech in which he emphasised the utility of the knowledge which such a scheme would diffuse to those who were on the threshold of their business careers, and the beneficial effects which would follow both to them and to the businesses with which they would in due course be associated. Among other interesting points which he made was the necessity for a competent, intelligent and responsible employee to deal with incoming telephone calls. Only too frequently to-day a very junior and inexperienced employee answers a person wishing to be put into contact with a firm, with the result that the latter immediately encounters an atmosphere of inefficiency, and often impertinence, of which the effect is difficult to gauge. The impression conveyed to a client



or prospective client, by such treatment upon being brought into contact is certainly worse than receiving correspondence on cheap, badly printed, stationery. The good effect of the first impression and of courtesy before dealing with the responsible official of the firm cannot be estimated with exactness, but it does not need to be enlarged upon for its importance to be evident.

A further point which the Chairman brought out was that a high percentage of ineffective calls experienced by users of the telephone was due to the fault of many of the subscribers themselves, a large number of whom have insufficient circuits to deal with

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the volume of their traffic, and as a consequence several calls have to be put through, owing to the lines being found engaged, instead of a single call establishing immediate connexion; and this in turn results in congestion both of junctions and of the originating circuits.

The party was split into small groups for the purposes of demonstration, and spent approximately two hours in the Exchange; and the nature of the expressions of thanks and pleasure which have been received leaves no doubt as to the interest awakened by the scheme.

The T.D.A. are to be congratulated upon their foresight, which cannot fail eventually to benefit both the public and the Service.

T. A. M.

CORRESPONDENCE.

HOW TO IMPROVE THE TELEGRAPH SERVICE.

TO THE EDITOR OF "THE TELEGRAPH AND TELEPHONE JOURNAL."

SIR,—In the July issue of the *Telegraph and Telephone Journal* I read the interesting article of a "Provincial Chief Superintendent of Telegraphs," entitled "How to Improve the Telegraph Service." I am in full agreement, especially with the proposal in the second part of the article dealing with the improvement of the skill of the operators in touch-typing. Thinking it might be useful to say something about analogous circumstances in the Dutch Telegraph Service, and of some of the experiences at a Dutch telegraph school for keyboard operation, I hope my observations will be found of sufficient importance for publication. If that be so, I trust they will add weight to the suggestions made in the above-mentioned article.

Before 1916, in the Dutch Telegraph Service, keyboard operating did not extend beyond the use of typewriters. Nowadays the number of these machines has much increased. Moreover, punching machines and teletypes, all provided with keyboards, have been introduced in the telegraph offices.

As was the case in your country, more attention could have been paid to training in keyboard working. Learners were left to their own devices as regards fingering and the use of all 10 fingers was not insisted upon. As it seemed very difficult to work the keyboard without looking at it, touch-typing was not taught. Consequently, in general, learners could not reach a higher speed than 25 words per minute (125 characters, spaces excluded), and the standard speed could not be fixed higher. Some of them, however, realising the special merits of touch-typing, endeavoured to increase their speed, and reached in practice more than 40 w.p.m. Nevertheless, the teachers did not think of the possibility, by training and practice, of putting such speeds within the reach of the majority of the learners.

In October, 1927, when a special school was established in Amsterdam for the new radio staff, attention was concentrated upon touch-typing with the object of turning out highly-skilled touch-typists. This was of considerable importance for the radio service as all reception (by ear or by tape) is done by typewriters, whilst tape-punching is carried out on Creed keyboard perforators. As the staff had to work both machines alternately, it was inadvisable to maintain two different keyboards, and as the typewriter keyboard was the less difficult to alter, the typewriter manufacturers rebuilt their machines with the same keyboard layout as that of the Creed perforator.

Now some particulars about the method of training. The training starts with typewriter exercises. Hands must be kept parallel, with the backs of the hands as nearly as possible in a plane parallel to that of the keyboard, in order to allow the fingers to fall exactly vertically upon the keys. The horizontal movement of the hands has to be reduced to a minimum. At keyboards with 3 rows, such as the teletype, practically all horizontal movement of the hands can be suppressed. The lower arms, without vertical movement and with the least possible horizontal movement, have to be softly pressed against the side of the body, and the upper arms are kept in a vertical position. After about 30 hours the pupils have memorised the positions of all the keys and are able to work the keyboard very slowly typing from touch. At that point daily tests, accompanied by a metronome (60 beats per minute) are imposed. As soon as 3 out of 4 tests in succession can be passed successfully (one of these 3 must be made without any mistake) the metronome speed is increased to 90 beats per minute, and practice continues until 3 out of 4 tests in succession at that speed can be satisfactorily performed. Thereafter the speed of the metronome is increased to 120 beats and so on up to 180 beats per minute. This speed corresponds to 30 words per minute (150 characters excluding spaces). The metronome tests have corrected the tendency of pupils to practice at too high a speed, and moreover the tests indicate to them the combinations in which they fail to maintain speed.

After the metronome period free tests are applied. The qualifying standard for typewriter and Creed perforator is 40 words per minute.

Twice a week a test is applied which consists of 1,000 letters of miscellaneous text in 4 languages with market and exchange news and about 20 codewords altogether on one sheet, and as soon as 3 out of 6 successive tests can be passed at a speed of at least 40 w.p.m., without any mistake and with a maximum of 5 corrections, a certificate is given. In many cases the learners are given the opportunity of continuing their training before they leave the school, and they reach speeds up to 50 or as much as 53 w.p.m. An average total training time of about 300 hours has proved to be sufficient.

Once capable of operating the typewriters, the pupils very soon become efficient on teleprinter keyboards.

In my opinion, it is necessary that the training must not be discontinued before the pupils feel fully conscious of their power to type accurately at high speed. Otherwise it is found that hesitancy and difficulty arise, with a tendency to abandon the touch-typing method, followed by a considerable decrease of speed. In connexion with this point I realise to the full the difficulties of the present staff, in their efforts to improve their efficiency. Much perseverance will be necessary if they are to overcome the special difficulties they will meet.

In conclusion, perhaps I might mention the three-row typewriter keyboard. Such a machine, which can be much more easily operated, is preferable to a four-row machine in all cases where other keyboard apparatus having three rows is alternately used by the same staff. In Germany hundreds of such machines are employed bearing exactly the same keyboard as the teletypes.

J. VEEN
(Referendaris 2nd Class of the Dutch Posts and Telegraphs, Chief Teacher of the Radio School at Amsterdam).

Amsterdam, Aug. 16.

[We are glad to publish the above interesting letter from an officer of the Dutch Telegraphs. It illustrates clearly the advantages to be obtained from a well-arranged and systematic scheme of training in touch-typing. The use made of the metronome is particularly interesting.—EDITOR, *T. & T. Journal.*]

CITY AND GUILDS OF LONDON INSTITUTE EXAMINATIONS.

TO THE EDITOR OF "THE TELEGRAPH AND TELEPHONE JOURNAL."

SIR,—With the advent of the 1929-30 session of winter classes, students drawn mainly from the Post Office engineering staffs, the Post Office manipulative grades, Surveyors' and District Managers' staffs and, to a less extent, the staffs of manufacturers of telephone and telegraph plant, settle down to a set course of study.

They aim at the certificates offered by the City and Guilds of London Institute, which certificates are recognised by the Post Office Department in allocating technical allowances, and in considering the merits of candidates for the grades of Inspector of Engineering and Assistant Traffic Superintendents.

From time to time vacancies are also offered through the medium of the Post Office Circular, for positions in the Colonial Services, it being desirable that candidates for such positions should possess City and Guilds certificates.

The Institute has accepted the mandate and thus becomes sole adjudicator of the telephone and telegraph qualifications of the candidates for the above-mentioned certificates, and it is, therefore, incumbent upon it to leave no stone unturned to offer a fair and reasonable opportunity to all students making their effort.

It may perhaps be assumed that, in view of the importance of these certificates, responsible officers of the Post Office Department are intimately concerned in the drawing up of the curricula, the conduct of the examinations, and the method of marking the papers set in the examinations. This assumption is, of course, open to correction.

Concerning the type of candidate, the engineering staffs may be roughly grouped in four classes: Inspectors, Repeater Officers, skilled workmen—established and unestablished—and labourers. The manipulative grades are essentially telegraphists and wireless operators, whilst the Surveyors' and District Managers' staffs include Assistant Traffic Superintendents, Clerical and Contract Officers. The engineering staffs possess practical knowledge of the subject according to their work, which, in practice, is often of a specialised character, e.g., constructional and maintenance work, underground and open line, is usually performed by fixed staffs, precision testing is not carried out indiscriminately, and staffs allocated to power plant usually remain there. Telegraphists and wireless operators are limited to the apparatus handled by them, whilst Surveyors' and District Managers' staffs are at the greatest disadvantage as regards the engineering side of the subjects, although from an administrative standpoint that portion of the staff attached to the Traffic sections is perhaps the best equipped of all.

The type of student would, therefore, indicate that whilst some few of them possess practical knowledge of telephone and telegraph engineering to a limited degree, the majority are dependent upon a theoretical knowledge obtained from standard works, assisted by the lectures given at the various technical centres throughout the country.

In recent years the examining body has seen fit to amend the syllabuses and considerable prominence is given to the fact that the curricula and scheme of examinations now recommended offer educational advantages to Inspectors in the engineering department of the Post Office.

Now, despite the undoubted advantages which the grouped courses offer to the Inspectors, the examining body has accepted a mandate to cater

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for the needs of the pre-described staffs, and the question now arises, is this being done ?

Again, the syllabuses for Telephony and Telegraphy have been revised in detail, mainly in the direction of giving increased prominence to line equipment and engineering of external plant, and whilst this may be all to the good in respect of Inspectors and workmen in the engineering branch, the position of students outside those grades is less happy.

At this stage it might be suggested that the subjects, particularly telephony, have a much wider scope than seems to be implied by the revisions of the syllabuses. Administrative telephony has made great strides in recent years, but one looks in vain for questions on this important branch of the subject—such questions would be appreciated by students drawn from the traffic sections—and the general inference suggests that the subjects begin and end with the study of telephone and telegraph engineering plant; its construction and maintenance. Now the duties of an Inspector of Engineering and an Assistant Traffic Superintendent do not coincide at any particular phase, but, as the Post Office Department recognises the same certificates in considering the qualifications of candidates for both grades, it is reasonable to assume that the Department would expect a good general knowledge of the subjects as a whole rather than a detailed knowledge of the working of each separate piece of apparatus. Such knowledge can only be obtained by actual practice, and it is safe to say that no student could cover the whole of the syllabuses in this manner.

Nothing need be said as regards the conduct of the examinations, as it conforms to the rules of most examining bodies, but in connexion with the allocation of certificates, there is undoubted room for improvement.

In the first instance, it will hardly be disputed that a three hours paper on subjects having so wide a scope does not enable a student to do full justice to the paper, and the Principal of a Technical Centre must always remain the best judge of the effort of a student who has attended his classes. No profession would attempt to judge a candidate's ability solely on these lines.

Again, does the examining body expect candidates drawn from so many grades to have detailed knowledge of particular phases of construction and maintenance to so marked a degree that they can do justice to the type of questions set, when the time allowed for each question, including diagrams, averages 22½ minutes, or are they satisfied if a candidate can indicate a good general knowledge of the broad principles of the subject ?

Available evidence points to the former, and if this is so the examination resolves itself into a question of a student being lucky if the paper falls his way and thus offers little encouragement to a diligent student who has endeavoured to cover the whole syllabus and to obtain a sound all-round knowledge. Nor does it encourage the lecturers at the technical centres to have their most promising students fail whilst less capable and less diligent students obtain a snap pass.

Consider for a moment the paper set on Telephony, Intermediate Grade, 1929, in conjunction with the corresponding syllabus. Five of the twelve questions were devoted solely to automatic telephony, thus giving a student dealing with auto apparatus the opportunity of answering five-eighths of his paper, although such a student might have the haziest ideas of manual telephony. In addition, there is a separate examination dealing entirely with automatic telephony.

If the examinations held in respect of the A.M.I.E.E. were carried out in the same manner, it would be reasonable to suppose that the type of membership would materially alter—and not necessarily for the better. The school examinations held at the technical centres are based on the work performed by students throughout the session and obviously the results are more in keeping with the student's general efforts. These circumstances should permit of a school report being taken into consideration in conjunction with the City and Guilds examinations.

Again, in order to reduce the possibility of error, the marking of a paper in most important examinations is not confined to one examiner. Is this the case in the City and Guilds examinations ?

In conclusion, it might be urged that the general indications are that the City and Guilds courses are drawn up mainly with a view to offering increased educational facilities to Inspectors of Engineering—a grade small in numbers—that the subjects are becoming increasingly difficult to engineering workmen, who are therefore discouraged from taking the classes, and that the students drawn from other staffs are not receiving proper consideration in view of the narrow ideas on the subjects taken by the examining body, who, it must be remembered, accepted a mandate by concurring in its certificates being used as a qualification for posts other than engineering posts.

A continuance of this attitude will result in a marked decrease in the number of candidates, which will be reflected in the technical centres taking less interest in the courses, or alternatively, pressing for a national certificate to replace that of the City and Guilds. The Post Office Department may also be pressed to consider new methods of testing the capabilities and qualifications of its staff if it desires to retain the technical allowances and the promotion of clerical and manipulative grades to technical posts. The telegraphists are fortunate in having the departmental technical examination as an alternative.

Consideration might also be given to the dates on which the examinations are held so that a student who has failed to obtain a certificate may continue the course and take both examinations the following year. At present the intermediate and final examinations are taken on the same date.

C. H. HAYCOCKS.

Liverpool: Telephone Traffic. Sept. 5.

C.T.O. NOTES.

Promotions.

Mr. H. Stewardson, Overseer to Assistant Superintendent.

C.T.O. Library.

The library was reopened after stocktaking on Sept. 9. Upwards of 500 new books were placed in circulation, the selection containing a good proportion of the latest novels in addition to such works as "Undertones of War," &c. Officers who have left the C.T.O. are eligible for membership and the subscription is quite small.

Music.

The C.O.D.O.C. are giving a performance of "Veronique" on Oct. 9 and 10, at the Kings Hall, Covent Garden, commencing at 7.30 p.m. This delightful French Comic Opera should appeal to lovers of musical comedy.

Sport.

The Centel Sports Association held their Fifteenth Annual Swimming Gala at the Shoreditch Baths, Pitfield Street, on Sept. 13. There was a good company in attendance and this annual meeting is becoming a miniature re-union, judging from the number of old friends who came to enjoy the programme.

Briefly the results were as follow:—

100 yds.	Club Championship	Mr. H. Megenis (Cable Room).
33 yds.	Ladies' Club Handicap	Miss M. C. Thorne.
33 yds.	Veteran Handicap	Mr. G. Corp.
67 yds.	Club Handicap	Mr. C. Shugar.
133 yds.	Inter-Divisional Team Handicap (Ladies)	Phonogram Room.
133 yds.	Inter-Divisional Team Handicap (Men)...	"B" Division.

The Cable Room beat the Inland Galleries in the Water Polo Match by 3 goals to 2.

During the evening a display of swimming strokes and diving was given by Miss O. Tarr (Southern Counties Junior Champion, 1927-8) and members of the Amateur Diving Association displayed their talents with high and fancy diving. These two items were much appreciated.

LIVERPOOL TELEPHONE SERVICE NOTES.

ON the evening of Sept. 20, the Traffic staff held a Hot Pot Supper at the St. George Restaurant, presided over by Mr. Staite, Traffic Superintendent. The occasion marked the promotion of Mr. Carroll to the post of Traffic Superintendent, Class II, at Preston.

Guests of the evening were Mr. Gauntlett, our District Manager, Mr. Parry, of Manchester, and Mr. Salmon, of Chester. We were very sorry that a prior engagement precluded the presence of Mr. Coombs, of Glasgow.

By reason of his Association work, Mr. Carroll is a prominent figure to Traffic people throughout the country, and all will be pleased to hear of his well-deserved promotion.

At the supper he was accorded a signal honour; one, by the way, which accentuated the good fellowship that exists amongst the nationalities in the Service. Here we had an Irishman with a well-known love and admiration for the Principality, being piped to his seat to the tune of "Highland Laddie," the pipes being played by an Englishman; the latter being a Scotsman by adoption—in other words, by marriage. It was unique.

Mr. Parry, Mr. Salmon and others paid due tribute to the efforts of Mr. Carroll, on behalf of the Association, and Mr. Gauntlett made a presentation on behalf of the staff.

We have to congratulate Mr. G. Green, Assistant Traffic Superintendent, on his success in the City and Guilds examinations held last May. He was awarded second place in the Final Telephony (Automatic) Examination and the Award carried with it a silver medal and £2 10s.

The result is a fitting tribute to the very considerable knowledge of automatic telephony possessed by Mr. Green by reason of careful application to the subject. Both first and second places in this examination were awarded to students from the Liverpool Central Technical School, and it is a pity that, as far as is known at present, no lectures will be held at that centre in telephone transmission this session owing to the lack of the requisite number of students necessary to form a class.

Of the three students who maintained the transmission course there to the end of last session, two obtained first-class certificates and one a second-class certificate.

C. H.

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GLASGOW TELEPHONE NOTES.

AN interesting little meeting took place in the Traffic Office on Aug. 29 to bid farewell to Mr. W. Palk, who after two and a half years' service with us as an Assistant Traffic Superintendent, has been transferred to Reading.

Mr. Palk was presented with a few small gifts by the Glasgow telephone staff. (The umbrella should be a lasting reminder of Glasgow!) After Mr. Lane and Mr. Coombs had expressed the wishes of the assembly, Mr. Palk replied with a few well-chosen words. His quiet, unassuming manner had endeared him to all of us, and his departure leaves a gap which will not be easily filled. Even the elements took a tearful farewell of him. However, Glasgow's loss is Reading's gain, and Mr. Palk is to be congratulated on obtaining a transfer which places him a day's march—or, to be more strictly correct, a night's train journey—nearer home.

Once again, Bill, all the best of luck! If you should give us a look in at Glasgow any time, we shall be pleased to see you. You will probably find the office reorganised again, but Ben Lomond will still be in position!

Two sons of our sister branch, the telegraphs, have recently "come over." They are now busily engaged in assimilating the wonders and the mysteries of the Traffic Branch, its organisation and its staff. We offer a cordial welcome to Messrs. E. N. Payne, of the Glasgow office, and S. Hutton, of Dundee, and by the same token we take upon ourselves to express the hope that their settlement in the "Junior Service" will be to the mutual advantage of the Department and of themselves.

On Style.

"Courtesy and cheerfulness should be the tone of correspondence."—(N.T.C. Circular).

"A courteous, reasoned answer, narrowed as far as possible to the facts, rarely fails in its desired effect, while intangible generalities only lead to prolonged correspondence."—(P.O. Circular.)

"I can still read with pleasure a book on any subject provided the author has style, which in literature is only another word for personality. Given this condition I could read with pleasure, though no longer interested in the subject, an official report."—(E.B.)

"Those of us who have a definite job of work to do in a definite time have to say what we mean, and take the consequences, or we should never get through with it." . . . "The type of English that we of the Civil Service are wont to use is almost invariably scrupulously accurate in grammar and syntax, and in this we can claim superiority over the commercial world. There is no danger of our being caught out in false concords or split infinitives; but there are worse things, in English prose, even than split infinitives, and something more is needed for the writing of good English than the avoidance of turns of phrase condemned by popular convention."—(Sir Ernest Gower.)

"Obscurity and affectation are the two greatest faults of style."—(Machiavelli.)

"There are men who, having nothing to say and nothing to write, are nevertheless so in love with oratory and with literature that they delight in repeating as much as they can understand of what others have said or written aforetime. The leisurely tricks which their want of conviction leaves them free to play with the diluted and misapprehended message supply them with a pleasant parlour game which they call style. A true original style is never achieved for its own sake. Effectiveness of assertion is the alpha and omega of style. He who has nothing to assert has no style and can have none; but he who has something to assert will go as far in power of style as its momentousness and his conviction will carry him. Disprove his assertion after it is made, yet its style remains. Darwin has no more destroyed the style of Job nor of Handel than Martin Luther destroyed the style of Giotto. Your man of letters thinks he can get Bunyan's or Shakespeare's style without Bunyan's conviction or Shakespeare's apprehension, especially if he takes care not to split his infinitives."—(G. B. S. to A. B.W.)

"The English-speaking world may be divided into—(1) those who neither know nor care what a split infinitive is; (2) those who do not know, but care very much; (3) those who know and condemn; (4) those who know and approve; and (5) those who know and distinguish. Those who neither know nor care are the vast majority, and are a happy folk, to be envied by most of the minority classes; 'to really understand' comes readier to their lips and pens than 'really to understand,' they see no reason why they should not say it (small blame to them, seeing that reasons are not their critics' strong point), and they do say it to the discomfort of some among us, but not to their own. The second class are those who would as soon be caught putting their knives in their mouths as splitting an infinitive and who have hazy notions of what constitutes that deplorable breach of etiquette. . . ."—(Fowler.)

"I wrote as I felt—sometimes in good spirits, sometimes in bad—always carelessly—for, God help me, I can do no better."—(Charles Lever).

LONDON TELEPHONE SERVICE NOTES.

Contract Branch Notes.

THE business done by the Contract Branch during the month of August resulted in a net gain of 3,319 stations as compared with 3,081 last year.

I have heard a rumour that a Contract Officer, experiencing some difficulty in explaining the working of a coin-box to a well-known titled lady, clinched the matter by saying "You put the penny in just like you used to put one in the gas-meter in the old days!!!"

Mr. B. Whitaker, of the Western Office, and Mr. C. Willoughby, of the North-West, joined the ranks of the Benedicts on Aug. 24. As a mark of esteem and a token of their good wishes the staff in the respective offices presented an oak dining-table to Mr. Whitaker and a canteen of cutlery to Mr. Willoughby.

Our congratulations to them, and our best wishes for good luck and happiness to them and their wives.

The Aero Exhibition, which was held at Olympia from July 16 to 27, was certainly one of the most interesting of recent years. The Air Ministry exhibit showed models of flying craft in chronological order from the glider to the present-day airships. Aeroplanes which have made history were also on view and partly open for inspection. The contrast between the giant planes and the clever little moths was most striking.

There were 205 exhibitors and 129 exchange lines were provided for their use.

* * * *

Sports Notes.

L.T.S. Cricket.—A successful season was brought to a close with a match against the A.G.D. at Chiswick, on Aug. 29, which the A.G.D. won comfortably. The Traffic Section have won the L.T.S. Shield for the first time, and arrangements are being made to hold a gathering of all the Sports Sections in Cornwall House, on Wednesday, Oct. 16, 1929, for the presentation of prizes and trophies won during the year.

Considerable headway has been made in the various branches of sport during the past, and much of the progress is due to the activities of the London Telephone Service Sports Association.

L.T.S. Bowls.—By winning the championship of the "A" Section of the Civil Service Bowls League the L.T.S. have qualified to meet the Admiralty winners of the "B" division, in the final tie for the Bunbury cup. The match is to take place at Chiswick on Thursday, Sept. 26.

L.T.S. Football.—The football season opens with two friendly fixtures on Sept. 16 against the Secretary's Office, and Sept. 23 against the Engineer-in-Chief's Office. The League tournament commences on Sept. 28, and the following is a list of engagements:—

Sept. 28 *v.* War Office—Home.
Oct. 5 *v.* Taxes—Away.
„ 12 *v.* Dollis Hill—Home.
„ 19 *v.* High Commissioner for India—Away.
„ 26 *v.* Ministry of Health—Home.

The team promises to be stronger than ever, and several young players have been secured who should help to speed up the team. Mr. Evans, of the Traffic Branch, is again the Secretary, and any players wishing to join the club should get in touch with him at once. Tel. No. Central 3600, Extension 442.

* * * *

London Telephonists' Society.—Sessions 1929-1930.

An interesting programme has been arranged for the ensuing session, the following are the particulars:—

Oct. 4, 1929. Presidential Address. Mr. P. J. Mantle—"The Value of Tradition."

Nov. 1, 1929. Lecture. Mrs. Anne Corner—"Speaking and Voice Production."

Nov. 22, 1929. Whist Drive. Caxton House Restaurant.

December 6, 1929. Lecture. Mr. W. H. Gunston (Editor, *Telegraph and Telephone Journal*)—"The Telephonist and The Press."

Jan. 4, 1930. Annual Dance. Bishopsgate Institute.

Feb. 7, 1930. Four Papers—"My Service."
By A Telephone Operator (Miss Hobdell, Operating School).
By A Hospital Nurse (Miss Merrikin, Elizabeth Garrett Anderson Hospital).
By A Saleswoman (Miss Ellt, Messrs. Selfridge & Co.).
By A Lady Journalist (Miss Kathleen Courlander, The *Daily Express*).

Mar. 7, 1930. Competition Night. Reading of Prize Papers. Final Trial of Elocution Competition.

April 9 and 10, 1930. A Telephone Play. Written by Miss J. M. McMillan. Produced by Mr. E. A. Pounds.

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RANDOM REMARKS TO HERB.

[*For the views in the following unofficial contribution to the problem, "How to Improve the Telegraph Service," we accept, as heretofore, no responsibility. What Herb. would be disposed to reply to his lively correspondent we cannot conjecture. He might, for example, say "Thank Heaven, my dear Klast, we have only to propose and not dispose of these experimental remedies."*

DEAR HERBERT,

Now that the shower has lasted for three weeks and has refreshed our droughty thoughts, it seems appropriate, even if we omit the kings and the good old cabbages, to talk of many things.

Very obligingly the Telegraph Service trips forward (it has been tripping backwards and forwards for a number of years now) to offer itself as a subject. Like the septuagenarian spinster floating into the beauty parlour, it has come to be improved. Well, the worst cloud appears to be public opinion, which is inclined to regard the telegraph system as fusty and obsolete. The remedy? Well, an effective one and one that applies to most branches of Post Office activity, would be to brighten the public rooms of Post Offices. It is not surprising that the atmosphere of many Post Offices has such a deleterious effect on both the staff and the public—you know what I mean, Herbert—that dark, super-official, dead-letter sort of smelly atmosphere. How much better it would be if Post Offices had something like the appearance of the public rooms of Banks, with their atmosphere of efficiency, although their real efficiency is probably below Post Office standard. Almost all of our offices could do with better lighting and a little more air. The remaining few seem to have too much of the latter for present-day fashions. Coloured tiles, whites and blues, might be substituted for the grey or dark green of our smaller offices, although you know, Herbert, we should have to take care to avoid a public wash-house effect. White, glass-covered counters might also come into the little scheme of things.

Another useful change, Herbert, might be made in the method of staffing the public offices. I am afraid that the union (for which I have a great respect) would not be wholly in favour of this, although, as we are all out for the same end, God bless us, it might if talked to nicely. The counter staff should be picked specially for their appearance and then specially trained in counter selling work. "Voices with a smile" at the counter might accomplish a bigger change in public opinion than any other single step, but training under a competent salesman would be necessary. I trust, Herbert, that you will not think I am advocating a Folies Bergère chorus, a bevy of duchesses or a market of cheap-jacks; I merely suggest a picked staff, specially trained on modern selling lines. And, of course, the social side needs development; it is the only means of keeping alive, in a nationalised concern, the spirit of keenness and public service once the joy of craftsmanship has been allowed to wane.

I wonder whether you would care to send a "standard" telegram for 6*d*. or 9*d*., Herbert? Whether you would care to send "Arrived safely, will write soon," or "Hearty congratulations and best wishes," or "Letter arrived. Will write early," or "Usual luck—send cash," which we could telegraph as A, B, C or D, and whether special booths at holiday railway stations would do much biz with the first example. I believe they do it in America, you know, but I am much too lazy to make sure. I agree with you *re* the press rate, Herbert. But if the Press is to be subsidised, why we can't take credit for the work at the ordinary rates in our accounts and show the subsidy on a separate account, I don't know.

You must be a little tired at hearing all this about telegraphs, so if you like we will hang on to a telephone wire instead for a few seconds, risking another shock thereby. Don't you think, Herbert, that our engineers would capture old Samuel Smith's prize for doing a job well? I mean they take such a pride in making a good job of a job and in being able to say "Yes, I built that and I am willing that the whole world should see it and judge me on that piece of work." So splendid, you know, Herbert, but so unfortunate from the economic point of view. I mean, for example, when we spend such a terrific sum on a small 15-line auto exchange, which can never be a paying proposition, at the expense of the town subscribers. Yes, I know that rural development is much more advanced in America, but the quality of the service isn't anything like the same on the rural lines, because they are provided so much more cheaply. But you know, Herbert, as the City and Guilds Institute award no certificates for telephone economics the engineers pay little attention to the commercial cost factor, and we daren't say anything against the engineers these days; but localised commercial accounts would be so interesting. Yes, I know, Herbert, it would be much better if the commercial and engineering staffs were under the same local chiefs; so much more co-operation and so much less jealousy, as well as a growth of the sense of proportion, you know; and it would be so much more efficient too—too efficient to be adopted for some time yet, I am afraid.

And have you thought what the psychological effect of giving credit for a hundred local calls free to new subscribers would be? Quite a big one, you know, Herbert, and as the new subscribers are not usually busy-hour callers, the cost wouldn't be anything like 8*s*. 4*d*. per new subscriber. And if we really want to develop, quite a good start could be made by allowing a 15 or 20% reduction on the rentals to Post Office employees, that is if, after office hours, they could still look a telephone in the face. And a small percentage commission to any Post Office employee raking in a new subscriber would, I think, produce good results, particularly in rural areas. As old Shake. might have said—we've gotter come out into the highways to seek for biz, Herb. Yes, Herbert, I am sure that the matter of raising the age of entry for boy messengers and girl probationers must have been raised before: you really musn't make such proposals, the advantages of which are so obvious.

And the Trunk Service? Yes, of course, we ought to have an urgent rate. You know, Herb., it may be worth thousands of pounds to business men at times to get a trunk call through within 5 minutes. The fixed time arrangements are only of use when it is known some time beforehand that such a call will be required. I think that the principal objections to an "urgent" service are the inconvenience, to the Department to make such special arrangements, and to subscribers who have booked calls over the same trunk route who would find the delays greater than they expected. But of course the "urgent" rate could be adjusted so that the percentage of such calls would be very small. The great thing is that the facility would be there if required. And we would be raking in the oof, you know, Herbert!

Frightfully Yours,
IKONA KLAST
(per L.M.S.).

LONDON ENGINEERING DISTRICT NOTES.

Fire at Sidcup Telephone Exchange.

THOSE officers who are more directly concerned with "Internal" work have of late followed with admiration the successful efforts of their "External colleagues" in maintaining the public service in face of disasters of great magnitude. During the past month, as a result of a fire at Sidcup Exchange, the internal staff found their opportunity to meet emergency with an equal determination to reduce to a minimum both the duration and extent of unavoidable inconvenience. And, in the opinion of competent critics, these objects were undoubtedly achieved.

The fire occurred on Saturday, Aug. 10, on premises adjoining the exchange and then spread to the roof of the latter. The ultimate result was to put the Sidcup Exchange entirely out of service. Indeed, the spectacle inside the exchange, arising from the three-fold effect of flame, smoke and water was extremely melancholy, whilst outside, the presence of fire engines vividly emphasised the nature of the calamity.

The engineering staff immediately responsible and available were quickly on the spot, whilst others, with an intimate knowledge of local conditions, were recalled from annual leave. In passing, it should be added that the difficulty of mobilising the staff was increased by the fact that the fire occurred on a Saturday during August—the height of the holiday season.

After consultation with building experts, it was decided that a temporary exchange should be erected on the ground floor of the damaged building. An alternative scheme, however, was in hand should expert opinion decide, on grounds of safety, against this course. In the meantime, consideration had been given to the means of restoring at the earliest possible moment, vital public services such as police, hospitals, ambulance and doctors, and within a few hours these services had been connected via other exchanges in the vicinity. On the Sunday following the outbreak, a spare suite of suitable sections in the Edgware Manual Exchange was removed to Sidcup. The work of re-conditioning the board and connecting the subscribers was then put in hand; this involved a considerable increase in the capacity of the home sections to enable the restored service to be brought into use not only with maximum rapidity but also with due regard to operating efficiency during the period immediately following the restoration of the service.

By continuous and wisely directed effort the new suite was rapidly made available and the whole of the circuits were restored within 6 days. Moreover, so efficient was the work performed that it is anticipated that, far from being a temporary restoration, the switchboard now in use will serve for several years.

A welcome aspect of an unfortunate event was the fact that the nature of the difficulties confronting the engineers and the rapid progress of the restoration was recognised in a most generous manner by the local papers.

Finally, it is pleasing to hear that the Executive Engineer and his staff have been specially commended for their services.

Midland Bank P.A.B.X.

Persons whose business takes them to the City every day may notice certain rebuilding operations going on, but probably do not give the matter much consideration owing to the gradual nature of the changes that are taking place. Those, however, who make visits at intervals of several months are very much impressed at the changes in the character of the buildings that are rapidly replacing those which previously existed. A typical case is that of the Midland Bank which has been constructed on the site of some small buildings in Poultry. The exterior is handsome and can be seen by passers-by. The change in the character of the building can, however, be best illustrated to telephone men by stating that whereas half-a-dozen direct exchange lines were sufficient to serve the old buildings, the new building has a P.A.B.X. with a capacity for 110 exchange and 900 extension lines.

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The present equipment is seven 100-line units with 670 line switches fitted, 8 manual boards, 35 first selectors, 7 second selectors and 63 final selectors. The current to operate the switchboard is supplied from two 400-ampere-hour batteries at 50 volts.

Although the building has only been in occupation a short time, the lines already in use are :—

71 exchange lines.
306 external extensions.
250 internal extensions.
6 tie lines.

The problem of the provision of line plant in such a manner as to allow so many external circuits to be connected up by the time that they are required without having made excessive provision for contingencies, is no small one.

Negotiations for important sites are generally conducted very quickly until agreement has been reached, and at the time a scheme for serving the area with line plant is prepared, there may be no hint that blocks of small, inconvenient buildings will be pulled down and in two years replaced by buildings of the type above described. The Midland Bank is one of the largest installations hitherto dealt with and has an exceptional number of external circuits, as the figures show, but there are many other large buildings recently constructed in which the demands for telephone lines have been very heavy. There is no doubt that when the longed-for revival of trade comes, the reconstruction of the City buildings will be further accelerated, and this will increase the demand for telephones, especially for the larger type of installation.

New Exchanges.

The following exchanges were opened during the month of September :—

	No. of Lines equipped.	*Date opened.*	*Manufacturer.*
National	9,500	Sept. 7	A.T.M.
Mitcham	1,480	„ 11	Siemens.
Flaxman	9,900	„ 14	General Electric.
Stanmore (C.B. Manual) ...	800	„ 18	Standard.

Obituary.

We record with deep regret the death of Mr. K. G. R. Graves, a young Inspector attached to the Cable Balancing Section of the London Engineering District.

Mr. Graves entered the Engineering Department on Mar. 2, 1926, after passing the open Competitive Examination for Probationary Inspectors. Then followed the usual period of training, which included a special course of instruction in cable balancing and precision testing at Dollis Hill. Subsequently he was appointed Inspector and attached to the section dealing with that class of work in the London district.

Here he proved himself reliable and trustworthy. Of a somewhat quiet disposition, he was nevertheless very capable and willing to take responsibility. He was respected by those who came under his supervision, and all who came into close association with him held him in great regard.

Early in July he went into St. Bartholomew's Hospital for examination of what was thought to be quite a minor trouble. It proved, however, to be serious and operation was decided upon.

This took place early in September, but Mr. Graves did not recover from its effect, and passed away on Sept. 4.

The Department has lost a promising officer, and we extend our great sympathy to his mother, sister and brother in their loss.

FOR OUR ADVERTISERS.

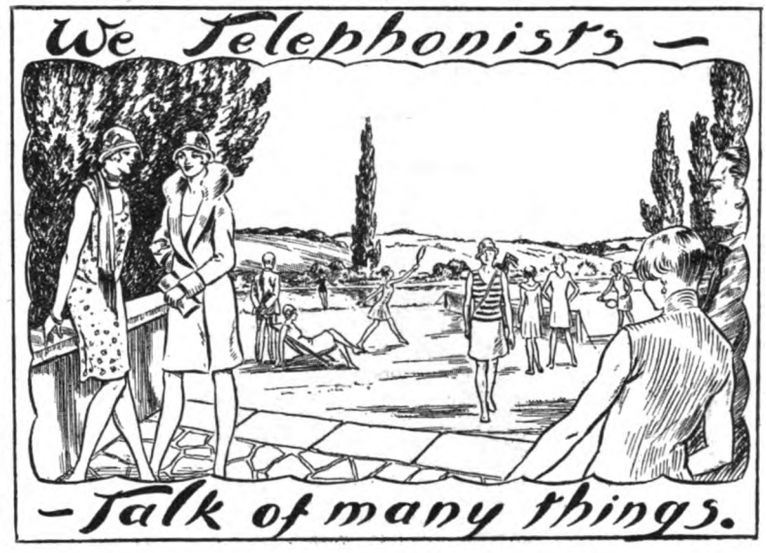
The following contracts are open, and all references should be made to the Department of Overseas Trade, London.—New Zealand, Wellington, Posts and Telegraphs, Oct. 15, Condensers (P. & T 151/1733). Reference BX 5602. Also, same date, Supply of B.P.O. type resistances (No. P. & T. 151/1712). Also P. & T. Department, Oct. 15, Supply and delivery of B.P.O. type resistances. Reference BX 5551. Also, same date and authority require supply and delivery of B.P.O. retardation coils. Reference BX 5552.

Cape Town Municipality, Oct. 16, Supply of paper-insulated cables (Specific. No. 474). Reference BX 5640.

New Zealand, Wellington, Posts and Telegraphs, Oct 16, Automatic wall and table telephones. Reference BX 5509. Also Automatic telephone dials (P. & T. 151/1734). Reference 5605. Also, Oct. 30, head receivers (P. & T. 151/1725). Reference 5603.

Melbourne, Oct. 15, P.M.G. Dept. Switchboard instruments, test plugs and sleeves (Schedule C. 472) Reference BX 5541. Also, Victorian Government Railways, Oct. 23, Supply dry core telephone cable. Reference BX 5638. Also, Melbourne P.M.G. Dept., Oct. 22, Supply insulated wire (Schedule C. 474). Reference BX 5581. Also, Nov. 12, Supply of (1) transmitters and (2) receivers with associated parts. Reference BX 5653 and 5656. Also, Nov. 19, Supply of telephone generators and motor generators. Reference BX 5662.

J. J. T.



The Editress.

By a curiously ironic stroke of fate, while last month's issue of this *Journal* was actually in the press with a portrait and a few light-hearted words concerning the Editress of this page, that lady was undergoing a painful experience. Miss McMillan, whilst motoring in Northumberland, was involved in a serious accident, resulting in the overthrow of the car and the pitching out of its four occupants. Miss McMillan was badly cut and shaken and had three ribs broken, but we are pleased to know that she is making satisfactory progress towards recovery. All our readers will, we are sure, join in a message of sympathy and sincere wishes for her speedy restoration to health.

The Lido.

One morning recently, before the clocks had been "de-Willatted," I rose at five and went into the garden. After mastering that mild look of surprise which rushed momentarily into your face when you heard that statement, you would probably say that, personally, you had no difficulty at all in believing me. But, you would add, you felt sure that an uncle on mother's side, a cousin, two irreproachable aunts—one married to an impeccable churchwarden—and several intimate friends would, quite frankly, disbelieve me. Believe me or believe me not, they would be justified in their unbelief. Nevertheless, there is a large percentage of truth in the statement. The garden and my entry therein are incontrovertible facts, but the 5 a.m.—ah, no ! No, no. The wish was never farther from the thought. I merely said it in order to test your ability to believe. I think it was the White Queen in "Alice in Wonderland" who said that believing was a matter of practice and that she had believed as many as six impossible things before breakfast. We may suppose that, had the White Queen been a telephonist, the service observation results would have presented no difficulties and raised no haunting doubts. Had she, on the other hand, been a subscriber, she would never have questioned any advice of "number engaged" or "no reply." Some of the things of life seem almost too good and others much too bad to be believed, but to believe the ordinary things requires no effort. To the unimaginative, seeing is believing, but to the imaginative believing is seeing.

Ere now you may have experienced considerable difficulty in believing that all or any of this has any bearing upon "The Lido." Dispel your doubt and believe at least that I have merely taken an inordinately long and round-about approach to what the birds believe concerning my garden. The sparrows and the finches, the tits and the starlings, the thrushes and the blackbirds, the robins and now even a warbler, believe that a visit paid at any time will be rewarded by a piece of bread, potato, fat or coco-nut—sometimes all four. But above all their belief has been centred of late on "The Lido." The Lido is at the bottom of the garden, in the shade, among the fallen leaves and rose petals, and it consists of a small dish of drinking water and a larger one for bathing. Incidentally, let me remark that the little heathens as often as not, bathe in their drink and drink their bath-water. The sparrows —as depraved and uncultured as any in this respect—believe that it is their Lido, and in consequence the Robin gets his bath as best he can. The larger birds seem to be more modest and prefer the early morning when there are no spectators, but they splash so much that they empty the bath. Bindle the Hound believes that Ethelbert (he's the rat) frequents the Lido in secret, but, of course, to hear Bindle bark one would think that there were rats in trees, books, running brooks, stones and, in fact, in everything. But Ethelbert is welcome and if he were not an unbeliever he would show himself oftener.

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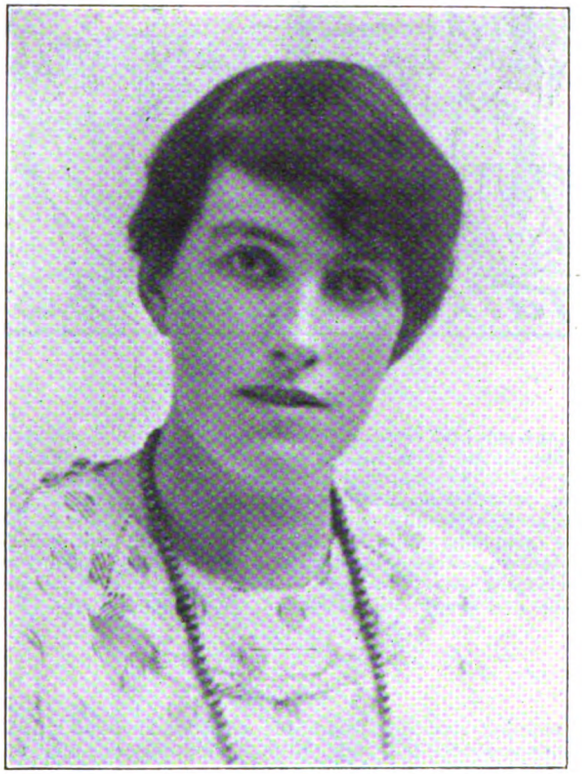
It would be a sad day for me if the birds ceased to believe in my garden as a haven of plenty and security. They seem to believe that I appreciate their sweet song and their cheerful twittering and that I am amused at their engaging antics and their fluttering offspring. But if the birds went I believe the green-fly and the snails and the worms would be happier.

PERCY FLAGE.

Our Portrait Gallery.



NO. 2—ELEANOR L. STAITE.

Miss Staite is the Chief Supervisor of the Sloane Automatic Exchange, and the mere recital of that fact will convey to all who know anything of the London Telephone Service that she must be the possessor in a highly developed degree of all those virtues which are associated instinctively with telephonists, and even more so with Supervisors. For those readers, if there be such, who have not the key to interpret this statement, let it be set out in cold print that Eleanor Staite is a model of courtesy and tact. The most irate and aristocratic of subscribers bursting with rage against the "ineptitude" of the Telephone Service, after a few minutes conversation with Sloane's Chief Supervisor is another being, scarcely able to understand what possible pretext could be advanced for having grown so cross.

It is recorded of Miss Staite that when interviewed for her original appointment as telephonist, the interviewing officer, a lady of very keen judgment, marked the form of this child "excellent," a quite exceptional marking. That the interviewer's judgment was sound as well as keen, all who have met and associated with Miss Staite will promptly agree.

Outside office hours she has established a reputation as a devoted daughter, an ardent follower of the outdoor life, loving a tramp among the Welsh hills or others even more "foreign." She is a keen gardener, pardon, it should be written horticulturist, for has she not attended classes on such specialised aspects as soils, artificials, &c. Above all she has the gift of a subtle humour, and lucky are those to whom she will recount the everyday happenings of her holidays or telephone experiences.

Mountview Swimming Club.

When scanning the newspapers during the summer, we were greeted with the fact that "this summer has been the hottest for so many years." We had ample testimony that such was the case by the much-needed dress reform of our half-hearted menfolk—their endeavours to keep cool did not appear as successful as the efforts of the telephonists at Mountview.

An open-air swimming pool was opened early in the summer for the benefit of the residents of the borough of Hornsey, and if the inhabitants of Crouch End and districts did not avail themselves of the boon the telephonists of Mountview did! My word—what jolly times they had!

MOUNTVIEW SWIMMING CLUB.

The swimming club, which normally hold their weekly club meeting at Hornsey Road Public Baths, arranged during the tropical weather for the club members to meet at the open-air pool.

Some idea of the good times the telephonists had can be gathered by the happy picture which one of the members photographed for the *Journal*.

D. A. P.

Imperial and Renown Swimming Clubs. The Ninth Annual Gala.

The general public often get telephone operators into hot water, but it was regrettable that so few subscribers were present to see the members of the Imperial and Renown (Trunk and Toll Exchanges) Swimming Clubs actually entering the water with a smile and behaving just like those people whose only mission in life seems to consist of asking for wrong numbers and becoming annoyed when they get the right ones.

Holborn Baths, on Tuesday, Sept. 10, presented a carnival aspect, and Miss Epps, who is presenting the prize for the Learners' Race (Toll) and the prize for the best attendance in the Summer session, must have been quite proud of the aquatic prowess of her girls.

There were many attractive items in a good programme, but chief interest of competitors and onlookers centred in the Team Race between the Day Staff of Toll and the Night Staff, which the girls won by 13 seconds.

The Night Staff had the temerity to issue a challenge to their feminine colleagues, thinking, perhaps, that the arms that were accustomed to reaching for distant exchanges, with the voice of an irate "sub." dinning in their owner's ears, would not be so capable at the trudgeon stroke with the cheers of a bevy of supervisors ringing the rafters. The Night Staff found out their mistake before the last 20 yards of the distance had been covered!

Another team race, between the London Telephone Service and the Rest of the Civil Service, resulted in a win for the L.T.S., and an Old Clothes

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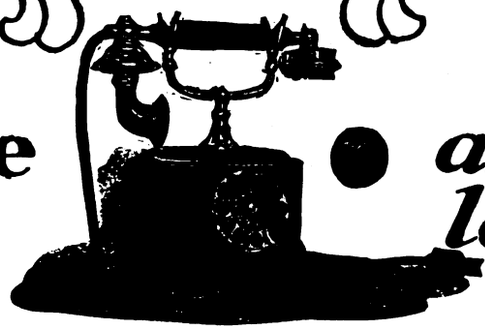
Telephone Pioneers



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THE POST OFFICE SWITCHES AUSTRALIA THROUGH TO AMERICA.

AMERICA talked with Australia by means of instruments of the ordinary telephone service for the first time on Wednesday, Sept. 25, when several officials of the American Telephone and Telegraph Company exchanged greetings with Australian telephone officials in Sydney. The occasion was an informal demonstration by the British Post Office of the practicability of connecting its existing transatlantic telephone system with the new short-wave radio-telephone channel operated by the British Post Office between Great Britain and the Australian continent, which may soon be open for commercial use. One of the Directive short-wave trans-atlantic radio channels now in regular use for the American service was used between London and New York and the voices of the speakers were thus carried a total distance of 15,000 miles by the short-wave system of transmission over two separate radio links inter-connecting the wire systems of the United States and Australia via the wire system of Great Britain. The speech from New York passed over land wires to the short-wave transmitting centre of the American Telephone and Telegraph Company in Lawrenceville, New Jersey, thence by radio to the short-wave receiving station of the British Post Office at Baldock, Herts, and thence by wire via London to the Post Office transmitting station at Rugby; thence by radio to the receiving station of Amalgamated Wireless of Australia and by wire to Sydney. The path of speech from Australia was again to Baldock, thence through London to Rugby and onward via the American Company's short-wave receiving station at Netcong, New Jersey, to New York.

An interesting aspect of the conversations was that they took place at 4 o'clock in the afternoon of Sept. 25, New York time, which in Sydney was 6 o'clock in the morning of Sept. 26.

The conversations were entirely successful, as were also repeat experiments on Thursday, the 26th.

A BRIEF CHRONOLOGY FOR STUDENTS OF TELEGRAPHS, TELEPHONES AND POSTS.

BY HARRY G. SELLARS.

(*Continued from page* 250.)

1884, Dec. ...	National Telephone Company issued adhesive stamps of five values to be affixed by callers at public call offices to forms held by the attendants.
1884, Dec. 17 ...	London's first trunk telephone line opened with Brighton
	1,227,000,000 letters and 25,000,000 parcels passed through the Post Office.
1885, Jan. ...	Sir Sandford Fleming advocated the establishment of All-British communication between Great Britain and Australia via Canada and Polynesia.
	J. A. Fleming devised a voltaic cell made up of zinc, zinc sulphate, copper and copper sulphate.
1885, Feb. ...	All-night telephone service introduced by the United Telephone Company.
	International Postal Union dealt with "Express" delivery of correspondence and postage of valuable articles.
	African Direct Telegraph Company subsidised (£25,000 per annum for 20 years) by British and German Governments for cables down the West Coast of Africa to the Cape.
	West African Telegraph Company obtained contributions (£44,000 per annum for 23 years) from Portugal and France for cables establishing communication with the colonies of these countries.
	W. H. Preece experimented with an inductive system of wireless telegraphy.
	Emile Baudot installed an experimental set of his apparatus in the Submarine Telegraph Company's office, London.
	Delaney Multiplex telegraph working introduced in Inland Telegraph Service.
	Electric railways laid down in several places in England.
	Electricity adopted for tramways in United States.
	Volta Laboratory Association produced the Graphophone in which sounds were recorded on wax.
1885, June 22	T. A. Edison and E. T. Gilliland patented in England an apparatus for telegraphing between moving trains without wires.
1885, July 1 ...	Parcel Post established between United Kingdom and Gibraltar, Egypt, Aden, and India.
	Postage for letters above 12 oz. reduced to ½*d.* for every 2 oz.
	First Parcel Sorting Carriage established.
	Special mail trains instituted between London and Aberdeen.
1885, Aug. 22	A. M. Rosebrough patented a mechanical telephone. Other mechanical telephones, notably, the "Atlas" and "Pulsion," made their appearance and were used to a limited extent.
	New Telephone Company floated to exploit the telephone invented by Silvanus P. Thompson.
	Long-distance telephone trials took place between London and Liverpool. Telegraph circuits were employed, and the speakers stationed in Uxbridge and Liverpool.
	American Telephone and Telegraph Company formed.
1885, Oct. 1 ...	Sixpenny telegrams introduced, free transmission of addresses abolished.
	International Telegraph Conference in Berlin. Destinations permitted as one word and code words limited to ten letters. Telephones discussed.
	Blathy, Deri, and Zipernowsky, of Budapest, introduced a system of working transformers in parallel.
	Ferranti, Kapp, and Mordey produced various types of transformers.
	Berry devised an alternating current transformer.
1885	Fawcett revision of Post Office wages.
	13,000,000 Money Orders issued.
1886, Jan. 1 ...	Parcel Post extended to various foreign countries.
1886, April 8 ...	1,500,000 words sent from the Central Telegraph Office, London, in connexion with William Ewart Gladstone's "Home Rule" speech.
1886, April 15	Emile Berliner patented a telephone transmitter with a horizontal carbon diaphragm.
	S.S. "*Carthage*" passed through Suez Canal at night by the aid of electric light—the first vessel to do so.
1886, May 1 ...	Inland Parcel Post rates altered to range from 3*d.* for 1 lb. to 18*d.* for 11 lb.
	Compensation up to £1 given in respect of damage to parcels if sender produced certificate of posting.
	Insurance of inland parcels and registered letters introduced at fees of 1*d.* for £5 insurance and 2*d.* for £10.
	Dr. Heinrich Hertz carried out a series of experiments in electro-magnetic induction and the effect of electric waves on surrounding bodies.
	Von Dolivo Dobrowolsky, G. Ferraris and Nikola Tesla produced motors with rotating magnetic fields.
1886, Sept. 1 ...	Money Order rates reduced to a scale ranging from 2*d.* for £1 to 6*d.* for £10.
	Gabriel Lippmann observed that the capillary forces existing at the points of contact between dilute sulphuric acid and mercury in a capillary tube are modified by a weak current or slight electric wave. He constructed a capillary electrometer.
	Mimault, a rival of Baudot, introduced a multiplex telegraph system.
	Dr. Chichester Bell described, before the Royal Society, his experiments which led to the invention of the "water-jet" telephone transmitter.
	Elihu Thomson, of U.S.A., described a method of electrical welding to the American Society of Arts.

(*To be continued.*)

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THE

Telegraph and Telephone Journal.

VOL. XVI. NOVEMBER, 1929. No. 176.

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All correspondence relating to advertisements should be addressed to MESSRS. SELLS, LTD., 168, *Fleet Street, London, E.C.*4.

TELEGRAPH AND TELEPHONE MEN AND WOMEN.

LXX.—MR. T. A. BECK.

MR. T. A. BECK—the subject of our illustration this month—is District Manager in charge of the Exeter District.

Mr. Beck entered The National Telephone Company's service as a boy, and in the course of a joyous period of employment on engineering duties he acquired a sound foundation and appreciation of engineering knowledge which has stood him in good stead throughout his official career.

At the formation by the Company of its London Traffic Department, he took up traffic duties, including Exchange management, and developed a wide knowledge of equipment and humanity.

Mr. Beck's qualifications marked him out for promotion to the rank of Assistant Superintendent of Traffic, Class I, in 1923; and in the initial stages of the study of automatic possibilities and in the introduction of the automatic system to London his knowledge and experience were of considerable value to the Department.

[*Photo by "Douglas," 46, St. James Place, S.W.*

He does not spare himself and it was a fitting recognition of his enthusiasm and capacity and his outstanding personality that he should have been selected early this year to take charge of the Exeter District.

He has always taken a keen interest in the welfare and the recreation of the staffs under his control. For many years his musical talent was in great demand. He has been a staunch supporter of Telephone Societies and Sports activities and is himself an athlete and sportsman of no mean attainments.

He is a man of many hobbies, and in all his recreations he is as enthusiastic as he is in his official duties.

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DR. R. V. HANSFORD.

IT is with the deepest regret that we chronicle the death of Dr. R. V. Hansford, Assistant Staff Engineer, of the Engineer-in-Chief's Office, following an accident at his home on Oct. 5.

Dr. Hansford was one of the outstanding men of the Department; young, active, and enthusiastic, he was successful at everything which he undertook. His bright and pleasing personality made for him friends in all branches of the Post Office, and his loss will be deplored by all of those with whom he came in contact.

Richard Vernon Hansford was born in 1888. He commenced his engineering training as an apprentice at Chatham Dockyard. From there he proceeded to Glasgow University, where he took Honours B.Sc. in Naval Architecture. Instead of taking up naval construction, however, he came to the Post Office as 2nd Class Engineer in 1910.

He served in the Edinburgh Engineering Section and in the Technical Section of the Superintending Engineer's Office at Edinburgh, afterwards being transferred to the Inverness Section in 1912.

During the war period he was engaged almost exclusively on naval and military communications in the North of Scotland, including the provision of circuits for the defence and administrative requirements of the Fleet at Scapa Flow and Cromarty Firth.

In 1919 he was transferred to the Radio Section of the Engineer-in-Chief's Office, which was then beginning to expand its activities after the restrictive period of the war.

From the first he was associated with the development of the high power valve transmitter. The early experiments led on to the design of the valve transmitter at Northolt, in which valuable experience was gained. Following on this came the design of the valve transmitter at Rugby, his *magnum opus*. All this work trod new ground and demanded courage of the highest order as well as technical skill. Many nights, as well as days, and many week-ends, were spent in unravelling the behaviour of high power valves and in tracking down the mysterious parasitical oscillations which occasionally threatened to blow the valves to pieces.

On the conclusion of the work at Rugby he obtained the degree of D.Sc., Glasgow University, for his thesis on the design of high power valve transmitters.

In 1925 he proceeded to America to discuss the preliminary technical arrangements for the transatlantic telephony circuit. This work absorbed his energies for several years and enabled him to give full play to his wonderful capacity for organisation.

His activities were not bounded by his work in the Radio Section. He was a member of the Institute of Electrical Engineers and an Associate Member of the Institute of Civil Engineers. He served as Secretary of the Institution of Post Office Electrical Engineers, where his organising ability found many warm admirers. He was Chairman of the 5th Commission of Rapporteurs of the C.C.I. Telephones, and he had just taken a very prominent part in the work of the British delegation at the Hague C.C.I. Radio, from which Conference he had returned only a few days before his death.

He possessed unbounded energy and could handle the minutest details of an engineering task with the same enthusiasm that he applied to the broader issues. He combined the mind of a lawyer with the technical knowledge of the trained engineer, and was therefore an extraordinarily valuable man in conference work. Upright and honourable in all his dealings with his fellow men, he always insisted on fair play and justice, tempered where necessary with sympathy. He had a keen sense of humour and a wide fund of cheerfulness which expressed itself in friendliness to all those around him.

His death is a severe blow to all those who worked with him, and the Department loses the most promising man of the younger generation, one who undoubtedly had a brilliant career before him.

Finally, we should like to tender to his widow and his family our most sincere and heartfelt sympathy. The sorrow we have felt makes us realize all the more fully the grief of those who were nearest and dearest to him. A. G. L.

THE DIPLOMA IN PUBLIC ADMINISTRATION.

BY J. T. E. A. WADDELL, B.A., D.P.A.

AT the first examination to be held by the University of London for this Diploma last July, only nine candidates entered, of whom five were successful, three unsuccessful, and one failed to put in an appearance.

This was not a too encouraging turn-out, and Professor A. M. Carr-Saunders, speaking at the Summer Conference of the Institute of Public Administration at Edinburgh, said that a much larger number of entrants was desirable to make it worth while for the University to undertake these expensive examinations, the cost of which is far from being covered by so few entrance fees.

I am writing this article, therefore, to draw attention to the existence of the Diploma examination, and to attract fresh candidates. The Institute of Public Administration and the University of London have been to a vast amount of trouble and expense in the establishment of this Diploma, and it is up to the Service to show their appreciation by entering for the examination in more encouraging numbers.

The Institute of Public Administration exists for the purpose of applying intensive study to the problems of the Administrator, and for the encouragement of higher education and the attainment of professional status in and for the Government Service, whether Central or Local. Up to the present, examinations for entry into the public service have been conducted rather too much on general lines, and not with sufficient regard to the subjects which would be of greater importance and use to the prospective administrator. Such is not simply my opinion, but the declared conviction of University Professors and Heads of Departments alike. The Institute has aimed at remedying this defect in Civil Service education by inducing the University of London to establish the Diploma examination, which requires competent knowledge in subjects exclusively useful to those engaged in the Government service.

This Diploma is the first University honour to be offered especially for acquired learning in matters appertaining to the work of Government. There has existed for some years past the degree of Bachelor of Science (Economics), and also the Diploma in Sociology. Neither of these, however, satisfy the questions which arise on the subject of Administration and the problems of Government. The Diploma in Public Administration combines both Economics, Sociology, and the business of Government.

I do not wish to overburden your columns with too much detail, especially as it is desirable that all those interested should obtain the full particulars of the conditions direct from the Institute of Public Administration, Palace Chambers, Bridge Street, S.W.1, or from the Registrar, University of London, South Kensington, S.W.7. Those who are in London may attend classes at the London School of Economics, Aldwych, or those outside may register

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as External students. The course occupies normally two years, and candidates entering now will be eligible for the Diploma examination in 1931.

The following are the subjects, of which more elaborate details will be given by the authorities :—

These are compulsory.	Public Administration, Central and Local. Economics, including Public Finance. Social and Political Theory.
Three optional out of these six (see syllabus).	Constitutional Development of Great Britain. Constitutional Law. Industrial and Social Development of Great Britain. Local Government in greater detail. Social Administration. Statistics.

Now you see what I mean. All useful subjects of every-day value. No languages. No metaphysics. No complicated mathematics (except statistics, which is optional). The whole forms a first-class political education, which cannot fail to interest and be of utility. Very comprehensive, certainly, and no easy job, but nothing to scare one at all. No essential need to undertake expensive tuition from Correspondence Colleges. And if I can be of any use to you, write to me at the Institute, as above, enclosing stamped envelope.

REVIEWS.

"First Year Electrical Engineering." By D. J. Bolton. Edward Arnold & Co. Price 5s.

This useful primer is divided into five parts taken in the following order :—

The Electric Current, Electric Chemistry, Magnetism, Electrostatics, and Applications.

In the last part, brief treatment is given to the subject of measuring instruments, Photometry, Telegraphy, and Telephony. An appendix giving particulars of constants of conducting and insulating materials, and answers to questions, completes the book. Both from the simple lucidity of treatment and the arrangement of subject matter the author shows himself to be well acquainted with the difficulties and limitations of the class of student for which this book is intended.

The judicious use of analogy and illustration, and the excellence of the printing, has resulted in a book that can be recommended to those whose groundwork in mathematics and physics is weak.

"Le Relais," Revue Mensuelle des Postes et Télécommunications. (Saint Cyr-l'Ecole.) 3 francs.

We are pleased to welcome the first number of the "Le Relais," a monthly publication of posts, telegraphs, and telephones, published by our colleagues of the French Post Office. In a prefatory note the editors state that the French Post Office, "apart from a certain scientific publication too heavy for the greater part of the staff, has no co-operative journal which fulfils the purpose at which we aim"; and the present publication is intended to fill this gap. The first number contains among other articles a technical account of the Belin system of facsimile transmission, a brief description of the International Postal Congress by Mr. Tyrrell, a contributor not unknown to this *Journal*, and an account of the various systems of "personal call" by Mr. Valentine of the American Telephone Company. There is an interesting literary column, but the Editors, perhaps as part of their efforts to avoid an "excès de vulgarisation," have not included any personal or social gossip.

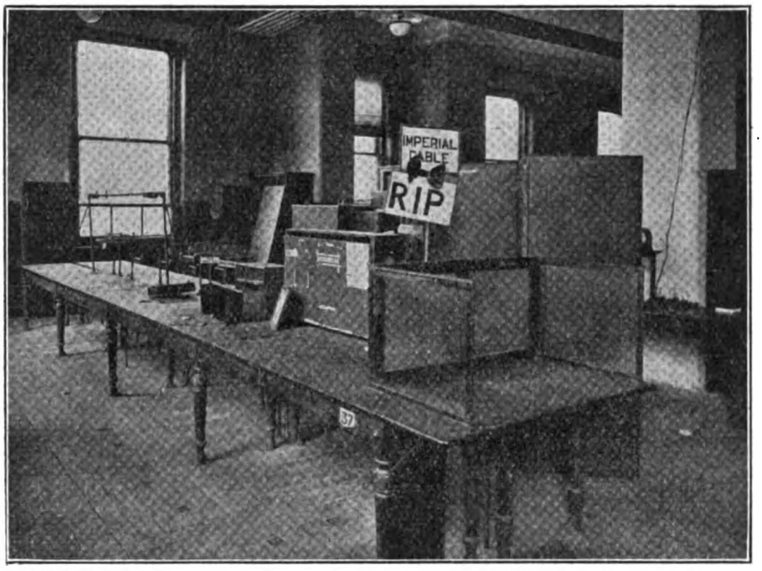
Altogether an interesting and useful venture to which we wish all success.

ICHABOD.

SUNDAY, THE 29TH OF SEPTEMBER, 1929.

THE weather was sultry and overcast, September striving gallantly, but in vain, to maintain its rainless record. The usual Sunday calm prevailed in the City; in the neighbourhood of the C.T.O. the only thing at all out of the ordinary was the sight of two plain vans drawn up in Roman Bath Street and a photographer hovering near. Even within the C.T.O. there was nothing spectacular to mark the passing of the Imperial Cable and Wireless services.

The time was 3 p.m. The Imperial Cables had already been moved, and only a miscellaneous collection of disconnected instruments and a large legend "R.I.P." marked the place where they had been. The Canadian and Australian Beams had also gone. The Indian Beam was moved a few minutes later; but so quietly was it done that a spectator would hardly notice its passing. The South African Beam was still hard at work with a mass of letter-telegrams on hand; not until 6.30 p.m. was it possible to transfer it.



The transfer itself took place at the Provincial Test, merely the joining up of the circuits to Penzance and the wireless stations with the circuits to Electra House and Radio House. "There was no hitch or incident of any kind": so runs the official report. That is the sort of ending that we could have wished: no "fireworks" or sensations, but quiet efficiency to the end. It was an engineers' field-day, and very well they did their work, disconnecting the instruments and packing them methodically in trolleys. The engineers, who assisted at the birth of the Beam services, were also present at their death-bed.

Now all that remains of the services, as far as the Post Office is concerned, is a large clock which shows the time at Bombay, a vivid map of the Imperial services, prepared by an enthusiast in Cardiff, a few graphs showing the trend of traffic, and some cordial telegrams of farewell from our colleagues in Australia, Canada, India, and South Africa. We are too modest to publish these.

Altogether, from our point of view, a funereal occasion, and our only consolation the knowledge that the funeral passed off very nicely. But these gloomy metaphors are out of place. It would be more appropriate to say that the services have been transplanted—a delicate process, as all gardeners know. For two years we have tended the Beams, and we flatter ourselves that the work has been well done; we do not doubt that in the new soil they will continue to flourish.

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TELEGRAPHIC MEMORABILIA.

IT has not hitherto been clear to a very considerable number of persons, and of those not a few, who, if they could not be looked upon as *experts* of radio communication would certainly not be classed as mere novices in that science, as to the figure-value of frequencies (wavelengths) expressed by the generic terms "medium," "short," "long," &c.

To these it will come as a relief to know that the International Consultative Committee responsible for the Technique of Radio Communication has decided that frequencies (wavelengths) shall be classified as follows: Low frequency, 100 kilocycles (usually abbreviated kc/s) per second and less, i.e., 3,000 metres and upwards; medium frequency, 1,500-100 kc/s, i.e., 200-3,000 metres; medium high frequency, 6,000-1,500 kc/s, i.e., 50-200 metres; high frequency, 30,000-6,000 kc/s, i.e., 10-50 metres; and very high frequency over 30,000 kc/s, i.e., below 10 metres. As most of us are aware, the frequency method of measurement was adopted internationally at Washington as being more accurate and precise than the wavelength method; but to those accustomed to thinking in wavelengths the change-over is confusing because a high frequency is a low wavelength, and *vice versa*. It may, therefore, be helpful to repeat the corresponding wavelength terms for the frequencies in the order mentioned above. They are: long, medium, intermediate, short and ultra short. The Committee also recommended, amongst other things, specific standards of accuracy in maintaining constant frequencies and the restriction of the power of broadcasting stations working on frequencies between 550 and 1,500 kc/s (545 and 200 metres) to not more than 100 kilowatts.

A correspondent residing in Bedford Chambers, Covent Garden, London, writing to the Press on the subject of the Post Office, cites the fact that on Oct. 11 a letter postmarked at 11.15 a.m. from Hatton Garden was delivered to the above address just 55 minutes later. While congratulating our postal colleagues on their success in obtaining this excellent flower in their cap from the public, it cannot but be remarked that should this standard of acceleration of the *postal* traffic be maintained the telegraphs would cease to smile at mention of the competition of the Postal Service. Fortunately, from a telegraph view, one may look upon the case quoted as an exception, and a happy one, to the average time of delivery, even in the circumscribed area mentioned.

According to the *Daily Telegraph* correspondent in Sydney, the Commonwealth Postal Department has coined the word "Picturegrams" to describe transmissions over the photo-telegraph service between Melbourne and the first-mentioned city. It may be the unfamiliarity of the word, but it does not strike one as altogether happy. Perhaps the writer is too fastidious.

"Telegram" itself is at times badly mishandled, so it would appear. Quite recently there was exhibited at the International Congress of Orientalists at Oxford a fragment of stone on which is inscribed a simple Coptic sentence, which, translated, means, "He died to-day." An *original* rather than an accurate journalist described this as "probably the first form of 'telegram' in the world." Gentle readers of the art of telegraphy, I put the case before *you*.

We might, with some reason, have associated the ancient hour-glass, or its descendant, the glass egg-timer, which latter, on more than one occasion, has been used to check three-minute calls—this in America, my *T. and T. Age* informs me—with the telephone, but Coptic stone inscriptions with the telegram, I think not.

The Institute of Railway Signal Engineers held its annual dinner on the 25th ult., and has a fixed programme for the months of November to February. The title of the paper for Dec. 11, for example, on "Some Notes on A.C. Rectifiers," is indicative of the complexity of modern signalling in connexion with railways. Quite another art than that of red, blue and green oil-lit lamps of long ago!

The Most Northerly Wireless Station.—This is apparently that established at Tranquil Bay, in Franz Josef Land, in the Arctic, by a Soviet expedition and is held by its commander, Commander Schmidt, to be the most northerly station in the world and to be equipped with the most up-to-date apparatus both as regards radio communication and meteorological services. Communication is maintained on a 43-metre wavelength, according to Reuter's Moscow Agency.

Obituaries.—As a distant link with the past of the Telegraph Service one would reverently mention the decease of Mrs. E. Trenam *relict* of Mr. Trenam, a one-time Controller of the C.T.O. Mrs. Trenam died in her 90th year, pre-deceased by her husband by some few years. The latter, it will be recalled by some, retired from the Telegraph Service in 1905.

Yet another link with the old telegraphing days has passed away by the death, in his 84th year of age, of Mr. William Payne, on Oct. 8, at Tottenham. "Pincher Payne," as he was for so long known, joined the old Electric and International Company in 1864, and was appointed to their Mincing Lane and Founders Court offices, and after the Transfer in 1870 became Clerk-in-Charge of the Night Check. He continued as such till he succeeded the late Mr. A. S. Coates in charge of the Moorgate Street Buildings office as an Assistant Superintendent in 1892, later coming to T.S., he ultimately retired through ill-health in 1903.

Personal.—All who can still recall Mr. T. Warren (Tommy Warren) in the C.T.O. London, who left the Home telegraphs to join that of the South Africa at the Cape, about three decades ago, and who recently paid a visit to the C.T.O., which naturally has changed beyond recognition—all indeed, one may repeat, will specially congratulate our colleague upon his safe re-arrival in Capetown on Sept. 13 last—safe and sound with his wife and family, after a thrilling experience.

The "family" passenger steamer, *Trafford Hall*, it appears, caught fire when they were 2,000 miles from Table Bay. After most courageous efforts by the officers and crew and the co-operation of the seventy odd passengers the fire was extinguished apparently, but broke out afresh upon their arrival at Cape Town. Mr. Warren was at one time in the Secretary's Office of the Administration in Pretoria and then became Postmaster of Simonstown.

May one offer sincerest congratulations to those fifty odd men who have transferred to the "Merger" service? One can only wish them well with intense earnestness. Most of them have taken courage in both hands, yet with no small amount of regret at the parting of the ways which have been none of their seeking. Without any sense of collective conceit, the writer knowing most of these officers personally, is desirous of affirming one thing very specially and confidently, i.e. that the company will certainly never regret the day that the half-hundred entered the service of their corporation.

Heard unofficially! Small Sub-office. Business man to postmistress: Time 9.30 a.m.: "Can I send a telegram from here, madam?" Postmistress to B.M.: "Very sorry, sir, I have no facilities here, but you can dictate your own telegram from the 'phone box outside." B.M. to P.M.: "No fear, can't waste any time like that. Too much fag." Walks out in high dudgeon.

Youth.—Youth is not a *time* of life: it is a state of mind.—*Anon.*

J. J. T.

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THE G.P.O. PLAYERS DRAMATIC SOCIETY.

THIS Society provided a treat for its members and their friends when they gave Mr. Bernard Shaw's "Devil's Disciple," preceded by Mr. A. P. Herbert's "Two Gentlemen of Soho," at King George's Hall, on Oct. 10, 11 and 12 last. To say that "The Devil's Disciple" is typically Shavian is really no more than to say that it is a play by Shaw, for all his plays can, by no great stretch of the term, be styled typically Shavian. Mrs. Dudgeon, Mr. and Mrs. Anderson, Major Swindon, General Burgoyne and Dick—who but Shaw could be the "onelie begetter" of these characters. In the dramatic scene between Judith and Dick in Anderson's house, both Miss Kathleen Emery and Mr. Jack Scott were at their best. Mr. Scott sustained an exacting part with great verve, although, at times, we thought he was inclined to err on the side of jauntiness. Mr. Cahill (excellent as ever) was thoroughly at home in the role of Anthony Anderson. We have nothing but the highest praise for Mr. Gartland's admirable rendering of General Burgoyne, while Mr. Pilkington made a sufficiently stiff and crusty Major Swindon. The scene at the "trial" is always a delight, and the P.O. Players did it full justice. It should be mentioned that Miss Isabel Hood gave a good rendering of Mrs. Dudgeon, and that the parts of Christopher, Essie and Lawyer Hawkins were very adequately filled by Stuart Godson, Miss Law and Cyril Leigh.

"Two Gentlemen of Soho" was a gorgeous affair. Mr. A. P. Herbert, in mock-Shakespearian garb, provided some rich fare. The artistically grouped heap of corpses, with a detective (an unconscionable time in dying) orating in spasms of heroic verse was something to be remembered. Mr. Pilkington, as the rhetorical policeman, was in great form, and indeed, the whole caste was well filled, Mr. Gartland, Mr. Alfred Doust, Mr. Eric Hudson, Mr. Cyril Leigh, Miss Dorothy Cleaver, Miss Dorothy Smith, and Miss Ling (who took her part at very short notice) all being well in the picture. Mr. Herbert got in some of his favourite and effective gibes at the *agent provocateur* in suave Shakespearian verse.

The plays were excellently produced by Mr. Reginald Purdell, and stage-managed by Mr. Eric Hudson. An orchestra under the direction of Mr. Will Harrison discoursed varied numbers during the intervals.

THE LEAGUE OF NATIONS.

LONDON TELEPHONE SERVICE BRANCH.

IT is perhaps known to many of our readers that a number of the London telephone exchanges are corporate members of the League of Nations Union and are accustomed to hold a yearly lunch-time meeting. In view of the inconvenience of this it has been suggested that one meeting should be held for the whole of the London exchanges—and such a meeting has been arranged to take place on Wednesday, Nov. 27, at Memorial Hall, Farringdon Street, at 6.30 p.m. Lady Gladstone has promised to take the chair at this meeting and the principal speaker will be Lord Cecil.

Mr. F. H. S. Grant (Assistant Secretary in Charge of Telephones) and Miss Agnes E. Cox (Superintendent, Female Exchange Staff) will also speak.

We feel that the objects of the League of Nations Union are such as to appeal with very special force to members of the London Telephone Service. Lady Gladstone and Lord Cecil have both shown great personal interest in enlisting the support of the London Telephone Staff and a keen appreciation of the value of that support. It is therefore hoped that there will be an enthusiastic response from the staff and that all members will extend their sympathy and help to the movement.

THE PSYCHOLOGY OF A TELEGRAPHIST.

EVERY trade has its psychology, quite naturally, and when we come to fundamentals so also has each individual unit. There are, of course, general principles which may affect the mass of any trade or profession, *some* which actually apply to every trade and calling.

In a recent book, edited by Dr. Charles S. Myers, on "Industrial Psychology," the doctor touches upon the latter when he apparently endeavours to maintain that the aim of Industrial Psychology is primarily *not* to obtain greater output, but to give to the worker greater ease at his work.

One fears, however, that such a statement would not be accepted at its face value by 95% of the rank and file whom it is likely to affect. To say this is not by any means to detract from the value of the many studies of industrial fatigue now proceeding, but only to place on record in these days of standardisation the intractability of human nature towards the limitation of its activities.

Dr. Meyer's foreword is not unchallenged even in his own book—in itself a tribute to his editorial fairness—for one of the essays attacks the wisdom of attempting to fix too rigidly such things as "the one best way of working." Our own telegraph service, it may be recalled, on one occasion received a good-humoured shock when an official pre-war order advised Morse workers when using the key to "keep the thumb well under"! Individual taste in Morse keys is permissible in the United States, the telegraphist purchasing his own key—a *privilege* which our English, Scottish, or Welsh telegraphists would probably meet with disapproval.

One could hardly imagine any telegraphist in the British Isles becoming intrigued by an advertisement such as the following, quite a usual feature in the columns of transatlantic service journals :—

> Try the Vibroplex Morse Key! See this new bug!
> Send with it! Buy it! $19, plus carrying-case $3."

Manipulation must be taught, of course, and certain principles must of necessity be laid down as, for a special instance, in touch-typing. Yet as is truly stated in the work quoted, when the worker is repeatedly time-studied or is forced to work in "the one best way," a point is reached at which the reaction to restriction asserts itself with almost primitive force. In fact, the possibility of more than "*one* best way" of doing a job should always be present in the minds of administrators.

One has found some of the most expert Morse operators who according to moderns or quasi-moderns were absolutely unorthodox in their methods. One has come across Hughes keyboard manipulators whose hands had been voted as impossibly unfit for operations of this kind, because of the short span of their fingers, but who nevertheless turned out to be among the fastest and most accurate of Hughes telegraphists.

Was it not our own telegraphists of the Morse printer era who themselves persisted in a terrible heterodoxy finding their own "best way" of "*reading* the slip" by listening to the time spaces of the Morse armature? This was persisted in despite the fact that the over-lords of that period imposed a fine in the case of each infraction of the prohibitive rule.

Is it not permissible to ask what would have been the effect on the staff of that day had the suggestion to read "by sound" in place of "by sight" originated with the higher powers?

O, Subtle Psychological Thought! After all, could such a thing have been possible that without any knowledge of twentieth century psychology the powers that then were, had of malice aforethought actually opposed the change—the value of which they had already fully appreciated—so that the staff themselves should impose the new system upon themselves? Who can tell?

J. J. T.

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CORRESPONDENCE.

HOW TO IMPROVE THE TELEGRAPH SERVICE.

TO THE EDITOR OF "THE TELEGRAPH AND TELEPHONE JOURNAL."

SIR,—It has been with considerable interest that we have read the various articles of your contributors on the subject of the improvement of the Telegraph Service, and perhaps we may be permitted to comment upon and add to the suggestions which have appeared in your columns.

We agree entirely with the view that the "shilling" telegram has outstayed its welcome, and the sooner its place is taken by a more reasonable and modern method of charging the better. Under present conditions the service rendered in many cases is out of all proportion to the amount charged. A telegram for delivery in the town of handing in is charged at the same rate as one involving some four or five telegraph transmissions over lines the maintenance and capital charges of which will probably amount to thousands of pounds per annum. A telegram for delivery in the same street as the post office of origin is charged at the same rate as one between the Shetlands and the Channel Islands. The suggestion to institute a system of charging on the basis of distance similar to that of the telephone seems to us to be very appropriate. In your September issue some criticism of this proposal was made on the ground that inequality existed because of the fact that a telegram sent over a distance of 100 miles with two transmissions costs much more to handle than one sent over a distance of 300 miles where only one transmission is involved. Some inequality is bound to exist in any system of charging. The exact counterpart of the instance quoted is quite apparent on the telephone side. In many cases a comparatively short distance call necessitating three or four switchings not only takes up more operating time but actually involves the use of more length of line than a call to an office more distant but in direct communication with the office of origin. The system of charging in use by the Telephone Service cannot, however, be condemned on that account. The reason why the zone system of charging is fair and reasonable is that it is based upon the undeniable fact that, taken on the average the shorter distance traffic involves less operating and maintenance cost than that of the longer distance. Nobody will deny that on the average the 100-mile message costs less to handle than the 200-mile message. As this principle can quite properly be applied to all traffic, a sound basis of charging is available. It is really amazing that we should have side by side two services of like character, one of which has a graduated tariff on the basis of distance and the other the standard charge of a shilling. If success has been achieved by the graduated charge in the one case, why should the principle not be applied to the other? The substitution of a flat rate for the Telephone Service would be as harmful as it would be absurd, and would probably reduce that service to a state which would compare unfavourably with that of the telegraphs to-day.

The decline in the number of telegrams handed in can quite clearly be attributed to a very great extent to the obsolete method of charging. When the Telephone Service was in its infancy there was no method of communication other than the Telegraphs, and the public simply had to pay the charge whatever it might be. Nowadays the man who used to send short-distance telegrams has his telephone installed and he uses it. He realises that it is much cheaper for him to use his telephone for short-distance work, and the "Telegraphs" for long-distance work. The fact that the public are overcharged for the local telegraph traffic leads to the loss of transactions to the Telephones. The local telegraph traffic is fast declining and will probably continue to do so until such time as the Department see the disadvantage of compelling the short-distance to subsidise the long-distance traffic.

The charges could be graduated on similar lines to the following:—

Under 25	miles	... ...	6*d.*
„ 50	„	... ...	9*d.*
„ 100	„	... ...	1*s.* 0*d.*
„ 200	„	... ...	1*s.* 3*d.*
„ 300	„	... ...	1*s.* 6*d.*
Over 300	„	... ...	2*s.* 0*d.*

It will be noticed that in the first two cases the "*Reply Paid*" telegram would bear comparison with the telephone charges (except for purely local calls) while in the remaining cases the advantages would rest with the Telegraphs by a fair margin.

Another matter which involves a dead loss to the Department and which requires immediate revision is that of the cost of casual delivery in rural areas. Cases can be quoted where the cost of delivery equals, and in some cases exceeds, the amount paid for the full service. We would suggest that the continuance of the telegraph delivery service could be made subject to a guarantee from the local authority of a sum equal to the annual cost of casual delivery less the estimated cost of the same number of messages delivered from an office where permanent messengers are employed.

An instance where the Department err in the other direction is in the case of second delivery and delivery in the town of handing in. The imposition of 1*s.* for a second delivery and the ordinary charge for a purely messenger service tends to make the Telegraphs unpopular.

We would like to join those of your contributors who urge the necessity of an "urgent" and a "deferred" rate in addition to the ordinary rate.

The need for the "urgent" rate is impressed upon every practical telegraphist every hour of every day. He is compelled to deal with traffic in order of turn when the nature of the messages varies between matters of life and death and snatches of friendly gossip. An additional charge of, say, 50% could be imposed and every effort made to ensure that the message reached the office of destination within half an hour from the time of handing in. The innovation would merely be an extension to the public of a service at present available to certain State departments. The increased charge would prevent or minimise any abuse of the service that there might be, and its effect upon the ordinary traffic would probably be so slight as to render unworthy any special consideration.

The suggested introduction of a "deferred" service in addition to the "ordinary" and "urgent" rates seems to us to contain the seeds of what would become a very popular public service which, while satisfying a real demand, would prove a profitable venture for the Department. During the day the postal side does not provide a satisfactory service between towns of any considerable distance apart. A letter posted in the forenoon is rarely delivered the same day unless the towns of origin and destination are comparatively near. There is consequently a gap between the 1½*d.* letter and the 1*s.* telegram which is not adequately covered by the Express Service. The need is a very quick postal service or a comparatively slow but cheap telegraph service. The former cannot easily be provided, but the latter seems a very sensible and practicable proposal. A "deferred" service would, we submit, involve no maintenance or capital charges, and the operating costs would be so far counterbalanced by the economies due to the allowable delay facilitating organisation that the service would be rendered profitable. In order to give a thoroughly satisfactory telegraph service it is essential to employ staff in excess of the normal or average requirements in order that periods of abnormal pressure may not cause confusion and delay. However accurate may be the basis upon which the necessary staff is reckoned, there is no escaping the fact that upon one day during a certain hour there may be a shortage of staff, while the corresponding hour of the following day there may be an excess over requirements. As all messages are equally important in the eyes of the Department, there is no margin of transit time and delay simply does or does not arise. It cannot be prevented. In this respect the deferred service by acting as a kind of shock absorber for the ordinary traffic would be most valuable. Staff hours normally allocated to "deferred" traffic would be available for periods of pressure upon ordinary traffic, and there would be minimum delay with a minimum wastage of force.

Assuming that the reduced charges for the short distance traffic were to be introduced and the deferred rate also made applicable, there would undoubtedly be a very great increase in traffic of that nature. It is also probable that, owing to the advantages of the "deferred" rate, there would be a considerable increase in the traffic of what may be called an intermediate distance (say 50 to 200 miles). On the other hand, the increased charges for the long distance traffic would probably result in a decrease in the number of messages handed in at the "ordinary" rate, but with the introduction of the "deferred" rate there would probably be little or no decrease in the aggregate number of telegrams even of the long-distance nature. For the long-distance "deferred" rate telegram the charge would probably be about the same as the present ordinary rate, so that there would be a general increase in revenue. In addition there would probably be important economies as a result of the greater allowable transit time of the deferred messages. If during the peak period two channels are justified on the present basis, two must be provided, but if a portion of the traffic could be subjected to delay of 90 minutes or so at that point, the permissible "carry over" could quite conceivably include the whole of the "deferred" traffic and thus one channel may suffice. With the extension of the use of Teleprinter apparatus to all circuits carrying 200 messages per day, the necessity for additional points between area centres and group centres would not arise as the carrying capacity of the instrument would in most cases greatly exceed the anticipated load. Some additional points would probably be necessary between zone centres and between zone and area centres, but it would probably be found expedient to reinstate some of the former non-basic circuits the withdrawal of which has had such a deleterious effect upon the quality of service.

With regard to the delivery service, it would seem that some form of docket system over and above a satisfactory basic wage would give good results. It may be argued that such a scheme would lead to competition and friction among the boys, but friction exists at present; only the motive may differ. It is well known to despatching officers that the most ingenious boy is usually the last on turn for despatch, but with the introduction of the docket system his skill could be used to better purpose to the benefit of all concerned. If the deferred service were to be introduced, delivery to a very large extent would probably be effected by the afternoon post. Deferred messages received later could be despatched with ordinary telegrams or, if necessary, in hourly batches. In rural areas where casual messengers are employed, delivery of deferred matter would probably only be effected by post or telephone.

The advent of the Teleprinter seems to have given the service a new lease of life and it is not difficult to visualise a really efficient, popular, and economically sound telegraph service with this instrument as the standard one in use. If there is no justification for any suspicion that our administrators are crying "The Telegraph Service is dead—Long Live the Telephones," we would respectfully suggest that they set about the task of reviving the

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service in real earnest. It is no use tinkering with all-night services from petrol stations and other minor matters when the whole system of charges is stupid in the extreme. Let us have a revision of our tariffs and a much more delicate and modern method of charging evolved. Let us have at each telegraph counter a notice of this description :—

SERVICES AVAILABLE.

	Urgent. *Maximum* delay 30 mins. to office of destination.	*Ordinary.* *Maximum* delay 90 mins. to office of destination.	*Deferred.* *Maximum* delay 6 hrs. to addressee.
	s. d.	*s. d.*	*s. d.*
Under 25 miles ...	9	6	4
„ 50 „ ...	1 1	9	6
„ 100 „ ...	1 6	1 0	8
„ 200 „ ...	1 10	1 3	10
„ 300 „ ...	2 3	1 6	1 0
Over 300 „ ...	3 0	2 0	1 4
	1*d.* per word after 12.		½*d.* per word after 12.

When this has been done the service will, we believe, be stimulated to a degree which will surprise even its best friends.

W. H. L. and J. S. (Carlisle).

[NOTE.—We welcome the interesting and well-considered proposals of our correspondents. In view of past experience, however, we suggest that they are rather optimistic in their assumption that Parliament could be induced to sanction any increase in telegraph charges.—ED., *T. & T. Journal.*]

HOW TO IMPROVE THE TELEGRAPH SERVICE.

TO THE EDITOR OF "THE TELEGRAPH AND TELEPHONE JOURNAL."

SIR,—Mr. J. Veen's letter in the current issue of the *Journal* is interesting, and he will be pleased to learn that touch-typing has been in operation in the Central Telegraph Office since 1907. In fact, I think the C.T.O., so far as the British Post Office is concerned, was the pioneer.

At its inception a speed minimum of 30 words per minute was necessary for qualification. Here again, I believe the C.T.O. was unique in requiring this speed test.

The question of style is intimately bound up in that of chairs, and I am glad to note that Mr. Veen stresses the position of the operator. Arms close to the body, shoulders and elbows in the same vertical plane, minimum movement of the forearms, elbows and shoulders, and maximum movement of the fingers. If the elbow is in the same horizontal plane as the middle tier of the machine then the operator is in the best and easiest position for typing.

The keyboard should be clear of obstruction so as to give the operator's body free movement.

It is gratifying to observe how at long last the telegraph authorities, which have the power to shape policy, are orientating their point of view in regard to such subjects as touch-typing.

In theory, type keyboard working is the final word in manipulation. Its ultimate success rests upon stability of apparatus and ability of operators. Given these two, then telegraphy must be efficient.

The C.T.O. recognised the need of manipulative efficiency and inculcated touch-typing, irrespective of the system by which it is performed, with the introduction of the "Gells."

Touch-typing is two-fold in its effects; it engenders accuracy and it prevents undue strain upon the operator.

Accuracy is essential in telegraphy, and just as eminence is attained in piano playing when the fingers sense the keys and the eyes remain fixed upon the score so in typing the same applies. The drudges are those who merely tintinnabulate upon the keys with uncertain finger movement.

To the touch-typist it does not matter an iota whether the keys are blind or shielded; his hands are anchored and confidence is bred to the total elimination of nerves.

Think, therefore, what this means to the health of the operator. There is no greater strain upon the nervous system than to acquire the painful habit of eyes glancing from copy to keyboard.

Its victims show it in their characteristics. They become neurotic, lack facility, their speech becomes slow, and generally the effect upon their mental virility is suppressive.

The British Post Office has instituted a periodical inspection. The officer performing this duty is instructed strictly to inspect the style of the operators. He must draw attention to a lapse and the Department gives facilities for a refresher to enable the operator to recover his self-possession.

Operators should realise these two-fold advantages of touch-typing, especially as the pencil, with which most messages are written, is trying to the eyes if the latter have to glance continually up and down. To coin a phrase: Touch-typing rivets the eyes and anchors the hands.

Rhythmic typing is good, and I am glad to know from Mr. Veen's interesting letter that the Dutch telegraphs are teaching their operators by this method.

The best schools teach similarly, though the principle is slightly different. At the Pitman's Colleges the instructor beats upon a sound-box. The students place their hand beneath the shield which hides the typewriter, the copy is on a rack, level with the eyes, and, on the word "go," the typing follows in unison with the beat.

I do not think there is a more appealing sound than that of rhythm, whether it is typing, a regiment marching, or perfectly timed music.

Of course, speed is necessary. No one should be qualified under 40 words per minute. This is an elementary speed, and the installation of keyboards is not justified at less.

It is pleasing to observe that the Dutch practice period is rather generous, and also to note the reasons advanced, viz., to ensure that the operator *shall be confident* when placed on "live" traffic. That is the only Mecca.

A variety of exercises sufficiently assorted to retain interest are, of course, desirable.

Allusion is made to a simplified keyboard. The British Post Office decided in this direction some years ago. A standardised keyboard is a *fait accompli*. Similar lay-outs with equality of touch are good manipulatively and allow for interchange of staff, which eases supervision.

The seeds of touch-typing have been sown and it is refreshing to see the fruit appearing.

It is many years since Mr. E. S. Pratt, of the C.T.O., started his lonely furrow for touch typing. Since that day his students have taught it in many offices, and perhaps, one day I may be permitted to detail the vital difference this method has made in the disposal of traffic.

C.T.O., Oct. 12, 1929. W. T. GEORGE.

THE FIRST EXCHANGE IN EUROPE.

TO THE EDITOR OF "THE TELEGRAPH AND TELEPHONE JOURNAL."

SIR,—In the October issue of the *Telegraph and Telephone Journal* there is, on page 7, evidence demonstrating that the first telephone exchange in this country was the "Coleman Street" Exchange, which was put into service during August, 1879. On page 4 of the same issue is an article describing the new Metropolitan Exchange.

It is interesting to note that the modern "Metropolitan" Director Automatic Exchange actually serves an area which includes the site of the original "Coleman Street" Exchange and that as it, like "Coleman Street" was cut into public service during August, it completes to a month exactly 50 years of progress of telephone engineering.—Yours faithfully,

H. G. S. PECK.

General Post Office (Alder House), Oct. 22, 1929.

FOR OUR ADVERTISERS.

The following contracts are open, and all references should be made to the Department of Overseas Trade, London.—London, S.W.1, South Indian Railway Company requires supply of power signalling for electrification of Madras suburban services. Apply specially by Nov. 8 to offices of the company, 91, Petty France, London, S.W. New Zealand, P. and T., Nov. 12, Supply of four-conductor telephone operators' cords. Reference BX 5685. South African P. and T., Nov. 14, Supply of 400,000 lb. hard drawn copper wire, 2,000 lb. soft-drawn tinned copper wire (Tender 173). Reference AX 8510. Chili, Santiago, Same date, Government Supply Department, Telegraphic material. Reference BX 5746. New Zealand, Nov. 18, Res. spools (P. and T. 151/1832). Reference BX 5716. Also, Nov. 19, Telephone transformers (P. and T. 151/1807). Reference BX 5718. Also, same date, Automatic wall and table telephones (P. and T. 151/1825). Reference BX 5717. Australia, Melbourne P.M.G.'s Department, same date, Supply telephone generators and motor generators (Schedule No. C. 479). Reference BX 5662. Melbourne, Government Railways, Supply of (1) 2,200-volt automatic oil switches for railway signalling, (2) indication transformers for railway signalling. Reference BX 5735 and 5737. Latest date Nov. 27. Also, by 25th, Victorian Electricity Commission requires tenders for watt-hour meters, remote recording instruments, &c. (Spec. 29/92). Reference BX 5672. Melbourne, State Electricity Commission, Dec. 16, Oscillograph equipment. Reference BX 5692.

J. J. T.

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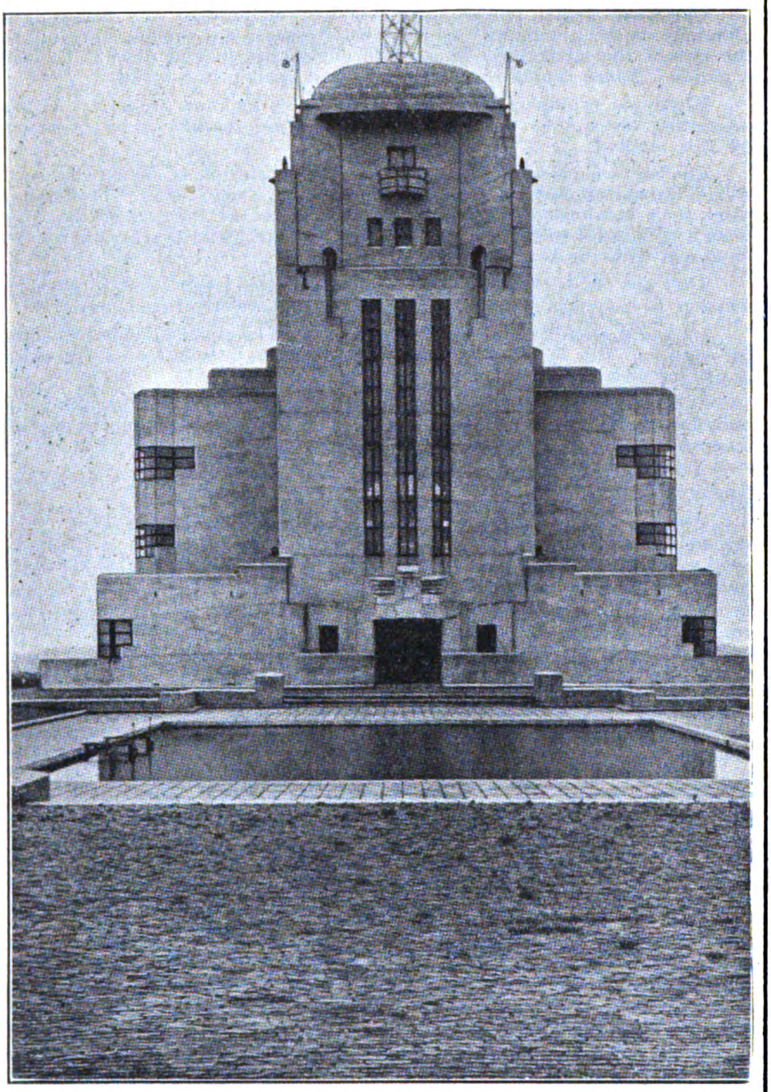

RADIO TRANSMITTING STATION (LONG-WAVE) AT KOOTWIJK, HOLLAND.
This building of striking architectural design is the radio station whence are transmitted the radio services between Holland and the Dutch East Indies.
[*Verslaagaan de Koningin betreffende den P. T. en T.*, 1928.

REMARKABLE CAREER OF A TELEGRAPHIST.

THE early history of Anglo-Continental telegraphy is very closely linked with that of the late Submarine Telegraph Company. It is therefore particularly interesting, if sadly so, to note the disappearance one by one of some of the pioneers. One of these, in the person of Mr. J. Jeffery, of the India Rubber, Gutta Percha and Telegraph Works Co., Ltd., quite recently passed away in his 76th year. It is true he only spent about two years with the "Submarine," and that as a Morse and Hughes telegraphist from 1870-2, but the practical experience thus gained added to his education at Victoria College, Jersey, gave an impetus to his scientific instinct, for he was almost immediately employed as assistant electrician on board the cable ship *Dacia* during the laying of the cable between the Lizard and Bilbao.

Then, continuing as senior clerk at the Lizard till 1874, he was appointed to the charge of the Marseilles-Barcelona cable at Marseilles, due doubtless to his knowledge of the French language. In 1876 he became Senior Superintendent of the Direct Spanish Telegraph Co., Ltd., at the Lizard. 1879 saw him again on board the *Dacia*, on the cable expedition between Marseilles and Algiers. In 1880 he laid a double underground cable between the Lizard and Falmouth, as also a similar one between Las Arenas and Bilbao in 1883. In August of the same year he was made manager of the entire system of cable stations of the Spanish National Submarine Telegraph Co. 1886-8, the management of the Northern division of the West African Telegraph Co. was added to his responsibilities.

The years 1872, 1874, 1879 and 1883-4 saw him busily employed in the laying of no less than seven important new cables.

On three occasions he represented his company at International Telegraph Conferences.

He was also a director of an electricity supply company and was Chairman of the Ross Electric Light and Power Company up to the day of his death.

J. J. T.

PROGRESS OF THE TELEPHONE SYSTEM.

THE total number of telephone stations in the Post Office system at Aug. 31, 1929, was 1,803,927, the net increase for the month of August being 9,503.

The growth for the month is summarised below :—

	London.	*Provinces.*
Telephone Stations—		
Total at Aug. 31	644,440	1,159,487
Net increase for month	2,780	6,723
Residence Rate Subscribers—		
Total	155,722	245,578
Net increase	779	1,931
Call Office Stations (including Kiosks)—		
Total	5,702	22,451
Net increase	31	445
Kiosks—		
Total	1,422	5,548
Net increase	39	80
Rural Party Line Stations—		
Total	—	10,493
Net increase	—	3
Rural Railway Stations connected with Exchange System—		
Total	17	1,194
Net increase	—	22

The total number of inland trunk calls dealt with during June, 1929 (the latest statistics available) was 9,670,669, representing an increase of 456,632, or 5%, over the total for the corresponding month of the previous year.

Further progress was made during the month of September with the development of the local exchange system. New exchanges opened included the following :—

LONDON—Stanmore, National (automatic), Mitcham (automatic), Flaxman (automatic).

PROVINCES—Abbotts Ann, Abbotsbury, Beattock, Burnt Pelham, Chilbolton, Coningsby, Llanfair Talhaiarn, Lorton, Whitwell (Herts) (all rural automatic) ; Bideford, Southbourne.

and among the more important exchanges extended were :—

LONDON—Bexley Heath, Eltham.

PROVINCES—Buxton, Frinton-on-Sea, Heswall, Norwich, Penzance.

During the month the following additions to the main underground system were completed and brought into use :—

Alsager—Sandbach,

Gallows Corner—Southend (section of London—Southend cable),

while 69 new overhead trunk circuits were completed, and 78 additional circuits were provided by means of spare wires in underground cables.

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LONDON ENGINEERING DISTRICT NOTES.

New Exchanges Opened during October, 1929.

Exchange.	*Equipped Lines.*	*Date of Opening.*	*Contractor.*
Colindale ...	Hypothetical on Hendon Automatic, which is equipped for 4,200 lines	Oct. 3, 1929.	A.T.M. Co., Ltd.
Hillside ...	2,400	Oct. 24, 1929.	Do.

London Engineering District Chess Club.

The London Engineering District Chess Club, known in the Civil Service League as the "Denman" Chess Club, comprising two competing teams in the League, opened its tenth session on Thursday, the 17th inst. In the unavoidable absence of the Club President, Mr. Gomersall, the chair was taken by Mr. Freeman.

The Chairman said that as one of the founders of the Club, he was keenly interested in its welfare. He deplored the fact that he had too little spare time to take a very active part in the Club's proceedings. Mr. Nevill, the Secretary, in giving a brief résumé of the Club's activities of the previous session, said he wished to congratulate the members on their continued strong affection for the game. It was, he said, a source of satisfaction to himself and the Committee to find their enthusiasm as great, if not greater, than when they started the Club ten years ago. It was also quite as keen satisfaction to be able to state that almost without exception their original members were still with them and going strong.

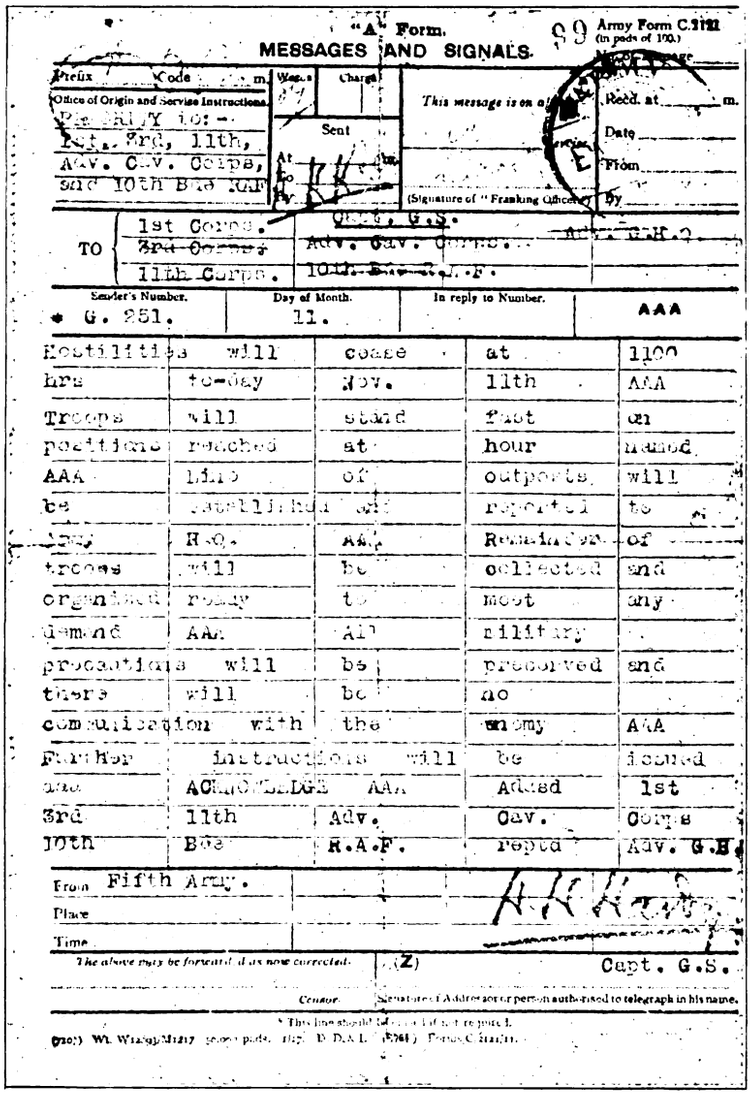
He (the Secretary) had again the pleasure of reporting that the Club had annexed a trophy of the Civil Service League. Their second team had won the trophy of Division V by scoring 11 out of a possible 12 points—winning 10 match games outright and drawing two. They would remember, he said, that this was the second time the Club had won a League trophy. In 1926-27 the first team scored 11 points out of a possible 13, winning the Division III trophy.

Their opening night was always the occasion of the Annual Prize Distribution. The prizes related to the previous session and had been keenly contested. He could safely say that no keener contest could be witnessed than the competition for the Club President's prize, the several rounds of which had prolonged the session into May, owing to adjournments and replaying of well-contested games.

The Chairman then distributed the prizes, and while congratulating the winners on their success, he referred back in several cases to the times when he and they had played for the original Post Office Engineers Chess Club at the Chief Office.

The first skirmish of the season consisted of a Lightning Tournament of five rounds, the ultimate winner being a veteran member of the Club, Mr. R. A. Wells, who showed conclusively that he could still give points to his younger opponents.

A most enjoyable evening, which promised well for success in the forthcoming session, concluded with a hearty vote of thanks to the Chairman.



"A" Form. 99 Army Form C.2121 (In pads of 100.)

MESSAGES AND SIGNALS.

Prefix ... Code ... m. | Words | Charge | This message is on a/c of Service. | Recd. at ... m. | Date ... | From ...

Office of Origin and Service Instructions: Priority to:- 1st, 3rd, 11th, Adv. Cav. Corps, 3rd 10th Bde RGA

Sent At ... To ... By ... (Signature of "Franking Officer") By ...

TO: 1st Corps. / 3rd Corps. / 11th Corps. — Cmdr. G.S. / Adv. Cav. Corps. / 10th Bde. R.G.A. — A.D.C. G.H.Q. / C.R.A. R.A.F.

Sender's Number.	Day of Month.	In reply to Number.	AAA
* G. 251.	11.		

Hostilities	will	cease	at	1100
hrs	to-day	Nov.	11th	AAA
Troops	will	stand	fast	on
positions	reached	at	hour	named
AAA	Line	of	outposts	will
be	established	at	reported	to
you	H.Q.	AAA	Remainder	of
troops	will	be	collected	and
organised	ready	to	meet	any
demand	AAA	All	military	
precautions	will	be	observed	and
there	will	be	no	
communication	with	the	enemy	AAA
Further	instructions	will	be	issued
also	ACKNOWLEDGE	AAA	Addsd	1st
3rd	11th	Adv.	Cav.	Corps
10th	Bde	R.A.F.	Reptd	Adv. G.H.Q.

From Fifth Army.

Place

Time

The above may be forwarded as now corrected. (Z) Capt. G.S.

Censor. Signature of Addressor or person authorised to telegraph in his name.

* This line should be erased if not required.

(2101) Wt. W14393/M1817 (5000 pads) 11/29. D. D. & L. (2761) Forms C.2121/1.

A MEMENTO OF THE FIRST ARMISTICE DAY.

Facsimile of original telegram ordering cessation of hostilities, Nov. 11, 1918.

London Engineering District Swimming Club.

The Home Office Swimming Club joined forces with the Post Office Engineers on Sept. 27, at the annual swimming gala which was held at the Lambeth Baths. Like its predecessors, the gala provided the members of the club and their friends with a really enjoyable evening's entertainment. All the events were keenly contested, and competitors never lacked the encouraging cheers of their supporters or the full measure of applause for their successes.

The artistic and clever display of floating given by the Lewisham Ladies' Swimming Club was fully appreciated by everybody, and Miss Phyllis Harding and the members of the Amateur Diving Association received well-merited applause. The great sporting event of the evening was, of course, the team championship of the Civil Service—the race for the Clark Cup. The Engineers had to take second place to the R.E.B. Club, who retained the trophy after a great race.

The swimming gala is rapidly taking its place as a social event of the year, to be eagerly looked forward to by club members as an opportunity for meeting colleagues, their wives and families, in the cheery atmosphere of a sporting occasion. We were all very pleased to see so many well-known faces among us.

NEWCASTLE NOTES.

THE New Bridge Street Baths was the scene of great excitement on Oct. 4, when the Exchange Swimming Club held its second Annual Gala. The attendance was excellent, the demand for tickets far exceeding the supply, and many late-comers were unable to obtain seats. A fine display of swimming was witnessed, the judges frequently finding it a difficult task to decide on the prizewinners.

The Club Championship Shield was won by Miss R. Farquharson, but not before last year's holder, Miss A. Beattie, had made strenuous efforts to retain the title. Miss Farquharson also was again successful in winning the cup for graceful swimming, whilst the medal for diving was awarded to Miss R. Wallace.

An interesting event of the evening was the invitation scratch race, open to the male staff of the General Post Office. The winner was Mr. J. Barratt, of the Postal Branch, a close second being Mr. C. Chambers, of the Engineering Department, while Mr. A. C. Miller, of the Telegraphs, was third. Much fun was caused by the novelty race, the entrants having to swim the width of the bath, don pyjamas, and swim back again.

Club members gave an excellent display of life saving, and the spectators were entertained by Mr. J. O'Neil, of the Gateshead A.S.C., who gave a most interesting exhibition of diving and ornamental swimming. The District Manager, Mr. J. D. W. Stewart, Club President, ably presided, and, in presenting the trophies, voiced the general opinion that the evening had been a huge success.

A Social Evening for Telephonists was held in the Brighton Assembly Rooms on Oct. 14, when Miss E. M. Holt, Supervisor of the Trunk Exchange, very kindly presented the swimming prizes for other events.

The first Telephone Staff Dance of the season will be held on Nov. 15.

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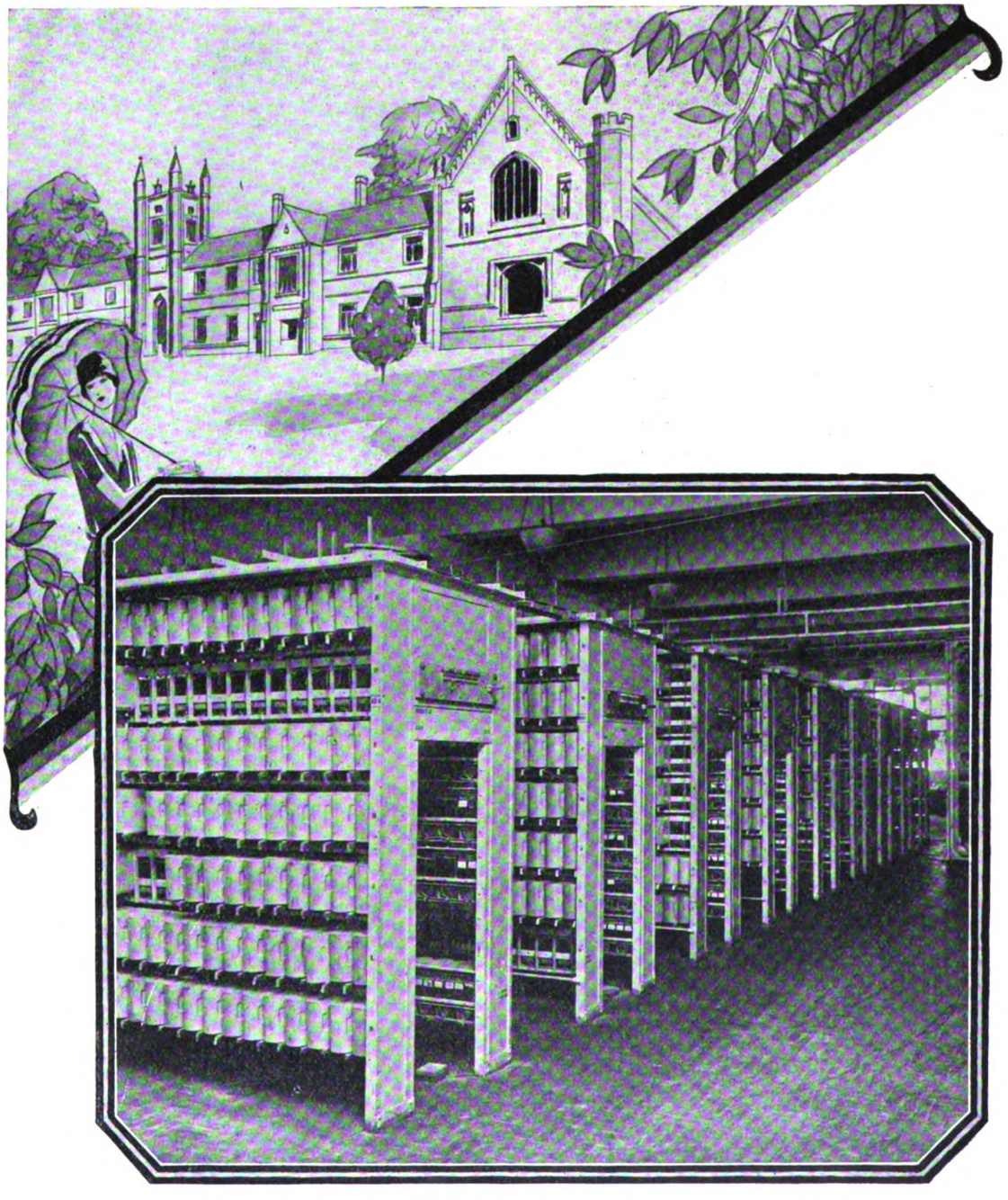

Strowger Automatic selector switches in the City North office, Sydney, Australia. New installations and conversions are constantly being made in Sydney with full automatic operation as the ultimate object.

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ney's Modern Telephone Service—
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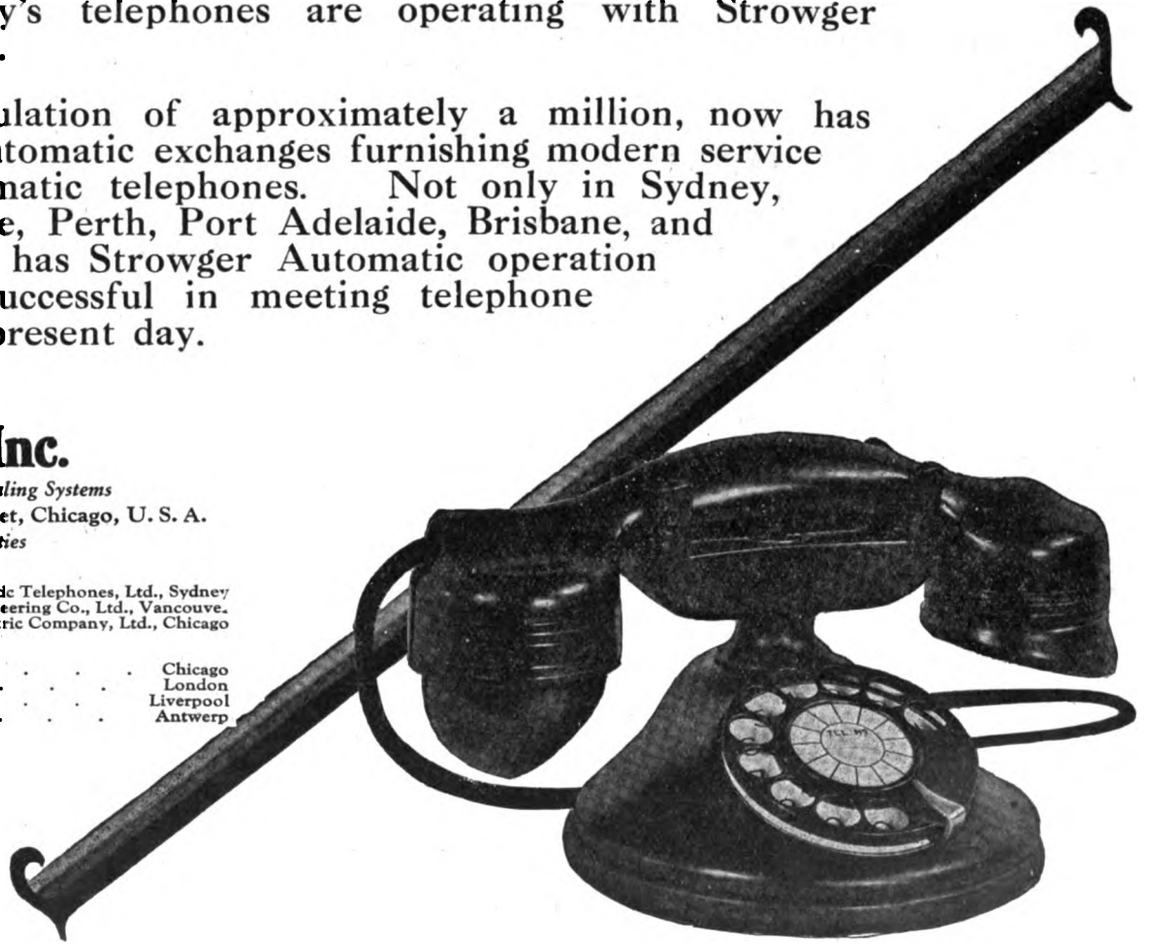
EARLY as 1914, the citizens of Sydney had their first experience with Strowger Automatic telephone operation and learned to appreciate its advantages. The success of the initial tion of this equipment was so marked, that subsequent ns and conversions have proceeded at a rapid rate under the on of the Australian Post Office engineers, until to-day more 0% of Sydney's telephones are operating with Strowger atic equipment.

, with a population of approximately a million, now has n Strowger Automatic exchanges furnishing modern service e 53,000 automatic telephones. Not only in Sydney, o in Melbourne, Perth, Port Adelaide, Brisbane, and g in Australia, has Strowger Automatic operation ound highly successful in meeting telephone ments of the present day.



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The
Telegraph and Telephone Journal.

PUBLISHED MONTHLY IN THE INTERESTS OF THE TELEGRAPH AND TELEPHONE SERVICE, UNDER THE PATRONAGE OF THE POSTMASTER-GENERAL.

Editing and Organising Committee - - - Lieut.-Col. A. A. JAYNE. J. STUART JONES. W. D. SHARP. J. F. STIRLING. J. W. WISSENDEN.

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NOTICES.

As the object of the JOURNAL *is the interchange of information on all subjects affecting the Telegraph and Telephone Service, the Managing Editor will be glad to consider contributions, and all communications together with photographs, diagrams, or other illustrations, should be addressed to him at the G.P.O. North, London, E.C.*1. *The Managing Editor will not be responsible for any manuscripts which he finds himself unable to use, but he will take the utmost care to return such manuscripts as promptly as possible. Photographs illustrating accepted articles will be returned if desired.*

VOL. XVI. NOVEMBER, 1929. No. 176.

TELEPHONE DEVELOPMENT.

MR. POWELL-JONES, in the course of the very interesting paper on the activities and aims of the Telephone Development Association which he read before the London Telephone and Telegraph Society last month, expressed his opinion that the general tone of Press criticism was more favourable to the Post Office Telephone Service than it was some years ago when his Association was launched. On the whole, this is, perhaps, true if we make allowance for a certain bias against any form of Government ownership, and for the humorist whose efforts figure so largely in the daily press nowadays and who finds in the telephone an inexhaustible, if somewhat hard-worked, mine of jokes. Nevertheless, a constant belittling of the usefulness of the telephone in the lighter columns and a reiteration of under-development, which amounts almost to indulgence in an inferiority complex, in the serious columns, does not, as Mr. GRANT pointed out in the discussion which followed the reading of the paper, make for increasing the telephone habit of the people or facilitate the task of raising this country's telephone development to the level of that of some oft-quoted foreign States.

It is manifest that the Post Office, the Telephone Development Association and the Press have a common interest in the expansion of the British telephone system. The first two for obvious reasons, and the last, not only because the more that system is developed and the more efficient it becomes the greater is its value to the telephone user, but also because they wish to see this country compare favourably with its rivals in all respects. We do not undervalue the stimulating effect of good criticism, and as postal officials we do not deny that the telephone development is for many and complex reasons much lower than we should like it to be; we only suggest that some kinds of criticism are scarcely calculated to achieve the end they may be presumed to have in view.

It is not generally realised that of the countries with the greatest telephone density (as shown in a diagram exhibited by Mr. Powell-Jones, and familiar to newspaper readers), only one country which is above Great Britain in the table, viz., Australia, shows a greater percentage increase during the last 8 years. Since 1920 telephones in Australia have increased by 111%; in Great Britain by 78%. In Germany they have increased by 63%, in Canada by 57%, in the United States by 42%, in Denmark by 30% and in Sweden by 22%.

It may, perhaps, be urged that it is easier to show a high percentage development on one million than on 13 million telephones, and that countries with a low telephone density should, in the nature of things, exhibit a more rapid growth. This, however, is not altogether the case, for telephone history shows that at that period when countries begin to reach a high density, the development curve begins to soar upwards. In other words, when the telephone habit is already firmly established, the demand for the telephone by those who have it not becomes the more insistent. Attempts to forecast the "saturation point" in a country's telephone development are invariably doomed to failure.

Each year the number of telephones added to the British system is larger than the last. In 1927 it was 121,000, in 1928 it was 125,000, and in 1929, according to all present indications, it will be between 128 and 129,000. This figure may be surveyed, if not with complacency, at least with hopefulness. It shows that Great Britain is at any rate making up some of its leeway in matters telephonic.

HIC ET UBIQUE.

A NEW telephone cable from Paris to Bordeaux, entirely underground, says *The Times*, was put into service on Saturday. The cable is part of a national scheme, of which the first link, from Paris to Lyons and Marseilles, was inaugurated recently. The Paris-Bordeaux line is 335 miles long, contains 200 strands, and cost 190,000.000f. (about £1,520,000). It is "loaded" by self-induction coils throughout its length.

According to the statistical report of Posts, Telegraphs and Telephones of Czecho-Slovakia for 1928, 77 new main telephone exchanges were opened during the year and 42 sub-exchanges. A long-distance underground cable between Dresden—Prague—Brunn—Bratislava has been laid with a view to improving the international services, and work has been commenced on cables between Prague and Pilsen and Brunn and Moravian Ostrau. Altogether 10 international lines and 226 inland trunk lines have been constructed and put in service.

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According to the *Daily Express*, both Mr. Ramsay MacDonald and Mr. Winston Churchill were called to speak on the transatlantic telephone. It adds rather naively: "but whereas Mr. Churchill hated it, the Premier appeared intensely delighted," for we learn from a subsequent paragraph that whilst the Premier had a pleasant chat with his family, Mr. Churchill was called from his bed to inform some quidnunc whether he considered Mr. Baldwin a Bourbon. If Mr. MacDonald had been troubled in the small hours to answer such conundrums as "Do you consider Mr. Snowden a Hapsburg or Mr. Thomas a Plantagenet?" he might have been equally displeased.

The *Hardwareman* recently published a very good article impressing on retail tradesmen the value of a telephone connexion. The writer argues thus with those who say they would prefer customers to come to their shops and buy personally:—

"If it could be assured that a customer would visit the shop when no 'phone was available it would no doubt be advantageous to be without one—but there is no such assurance. The probability is that the customer will go elsewhere either by 'phone or passing.

If a hardwareman is catering for a decent family trade a 'phone is essential, and if he cannot secure half a sovereignsworth of business by it in a week he is a poor salesman. One and three-quarter million people don't subscribe for the fun of the thing, and the fact should be allowed to sink deeply."

The *Daily Mail* is responsible for the following story:—

"Last week two foreign women entered a 'bus and asked to be put down at a certain private house. When they were asked where it was situated they said they had forgotten the address, but handed the conductor a piece of paper with a telephone number on it. 'You can easily find it out from that,' said one of them in excellent English.

"When the conductor explained that he did not carry either a telephone book or a Post Office Directory or a wireless telephone, and was naturally unable to help them, one of them replied: 'Any *gentleman* would take the trouble.'

"The story is so incredible that I believe it to be true."

After this comment, the narrator is, we think, ripe for entry into some strict religious order.

Miss Marion Lorne, before her appearance in the play "Sorry You've Been Troubled," underwent a short actual experience of life in an exchange. She came out of it with an enhanced opinion of the operator. She writes in the *Daily Sketch*:—

"In my far from blissful ignorance I used to rave at the poor dears for giving me the wrong number. I never thought of the number of times they gave me the right one. Of course, I know that when a man's got the toothache it doesn't console him, not much, to be reminded how often he hasn't got it. And no doubt that applies to the 'phone. But all the same, it's true.

"And if you saw the girls at work, getting the next number just as they've plugged the previous one, with lights flashing up and vanishing in front of them, like the magicians' fires on the Isle of Voices, well, you'll never grumble again."

A visit by a disgruntled subscriber to an exchange has often produced a similar result.

A Reuter's telegram story about a £140 call from Toronto has been going the rounds of the Press. It shows occasional embellishments and emendations in its different versions, but the standard text is as follows:—

"A prominent Welsh visitor to Toronto was charged £140 when, after asking for a telephone connexion with England, he inadvertently left the receiver down (or 'off the hook,' some versions) while looking up some information (some authorities add 'and forgot to hang it up again').

"He was finally billed for a 52-minute transatlantic call, amounting to over £140, during which time the line had been kept open for him.

"The visitor was unaware that the system obtaining in Britain does not apply in Canada, namely, that the call is broken off automatically at the end of six minutes. He paid the bill, however (some versions insert 'nobly')."

We give the story for what it is worth, and are sorry to spoil it by observing that in Great Britain the call is not broken off automatically at the end of 6 minutes. The operator merely announces "3 minutes," "6 minutes," &c., at the end of each 3-minute interval, and the call runs on. We imagine, however, that the operator, on observing that no one was speaking, would disconnect the line and terminate the call.

By the way, how does one become a "prominent" visitor at a place. Would you, gentle reader, become a prominent visitor at Eastbourne, for instance, by bathing from the beach in a macintosh, or occupying the largest suite in the largest hotel, or how?

The following "unsolicited testimonial" was recently received by the District Manager of Telephones, Newcastle-on-Tyne, from a Newcastle firm, and circulated amongst the exchange staff:—

"Having now been transferred to Central 8383, we presume that the operators that looked after us on the 1115-6-7 lines will not be the same as are attending to us now.

"That being the case, we should be grateful if you would tender to the operators who have in the past been looking after us, our grateful appreciation for the excellent attention we have had throughout.

"Naturally, in the course of time, these operators have been many and varied, but the last year or two the attention has been of such a high order we feel we would like the girls to know how much we appreciate it.

"From our few days' experience on the new switchboard, we are glad to say that we appear to have been equally fortunate now."

The District Manager, in thanking the subscriber, remarked that our good deeds as a rule passed unnoticed, and it was only when something untoward occurred that we heard from subscribers. The letter was therefore as an oasis in the desert, and as a well-spring to a thirsty man.

THE VALUE OF TRADITION.

BY P. J. MANTLE.

(*Reproduced from a paper read to the London Telephonists' Society, 4th Oct.*, 1929.)

BEFORE proceeding to the consideration of the value of tradition as an aid to progress in our own individual sphere of telephone work, it may be helpful to postulate the view that we live to-day in a world in which progress is steadily maintained and that tradition plays an important part in this advancement.

You will remember that it was Shakespeare who said:—

"The *evil* that men do lives after them,
The *good* is oft interred with their bones."

but it may be contended that if this Shakespearian view were even remotely true, human progress would be impossible. Rather would it seem to be the case that progress is largely dependent upon tradition, and that—most fortunately—we have the ability to select, perpetuate and build upon the good, and that any retrogression caused by evil is but a transient phase.

On the question of general progress H. G. Wells, in his "New Worlds for Old," expresses this view:—

"In spite of all the confusions and thwartings of life, the halts and resiliences and the counter-strokes of fate, it is manifest that, in the long run, human life becomes broader than it was, gentler than it was, finer and deeper. On the whole—and nowadays almost steadily—things get better. There is a steady amelioration of life and it is brought about by goodwill working through the efforts of men."

In any attempt to evaluate our own contribution to this steady progress in human affairs—and improved methods of communication play no small part in this—it is possible, I think, to demonstrate that we and particularly the younger members of our profession have inherited many very valuable traditions and that we have our share in the "inheritance of obligation" which such traditions must impose.

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It seems fairly obvious that the more these obligations are recognised the greater will be their influence for good, and it is with the object of gaining acceptance of the view that traditions have been established in our Service that I have (with some diffidence) ventured on a paper on this abstract and rather ambitious subject.

And in case it is thought that preference should have been given to the consideration of some more practical and perhaps technical aspects of our Service, with its manifold problems, I would like to quote the following lines that I came across recently in Bailey's "Festus" which seem to have a bearing on the case:—

"We live in deeds not years,
In thoughts, not breaths,
In feelings, *not in figures on a dial.*
We should count time by heartbeats."

In these days when the study of industrial psychology is engaging more and more the attention of authorities responsible for the control and guidance of large staffs, a good deal is heard of what is termed "The will to work" and how its development can be fostered. This "will to work" is a quality that all normal individuals possess to a greater or lesser degree, but is subject to influences, some of which may act as incentives and others that may have a deterring effect.

The incentives to do good and better work would include such things as, actual pleasure obtained by the performance of a congenial task, the desire to conquer difficulties, the desire for gain whether in money or position, the desire to establish a reputation and, more particularly, the force of immediate example.

The "will to work" is affected adversely by such deterrents as difficulties over which the worker has no control, outside distractions from the task in hand, the absence of interest and enthusiasm, and the lack of appreciation by superiors of good work performed. But possibly the chief deterrent to the attainment of the right will to work on manipulative duties is a sense that the work is being done under compulsion, and it is here that the incentives of present example to be copied and established traditions of good service to be maintained will have their greatest scope for exercising a beneficial influence.

For the purpose of inculcating in any staff a proper regard for the importance, the responsibility and the dignity of their labours, it is difficult to conceive of any more effective measure than to secure the recognition of traditions of work well done, and in this way to obtain what Francis Bacon calls "The Force of Custom."

The value is enhanced by the irresistible nature of the appeal of tradition to all those to whom its upholding and continuance is entrusted, since before a tradition can be recognised as such, the moral obligation it enjoins must have an universal acceptance.

I would submit that, generally speaking, a tradition is not established as the work of one man only, although it may be the work of men inspired by one man. The Nelson tradition, for example, has been established by its recognition and adoption by succeeding generations of the Navy, so that the precept it enjoins has become a first principle.

Neither would it seem to be the case that traditions are created consciously. "A task in hours of insight willed" is carried out faithfully and well, and a standard of efficiency is created and emulated by others. Given conditions which make its continuance possible, the recognition of this standard becomes more general and in the fulness of time a tradition is established.

In this paper I have dealt only with the *value* of tradition and have necessarily confined myself to those examples which appear to be worth perpetuating. That there have been foolish and unworthy traditions will be obvious. The tradition which was maintained for so many centuries that a woman's sphere in life was bounded by domestic and maternal cares, and that her only modest dress should consist of an amazing swathing of draperies and millinery, was obviously one which could not be maintained in more enlightened days.

In considering the question of the inception, growth, and establishment of traditions, one is inclined to think that they can only be looked for in association with old time-honoured institutions, but traditions can, however, be found exercising no small amount of influence in such comparatively recently established callings as those of aviators and wireless operators, to name only two. It is true that the wireless operator's tradition of remaining at his post in the sinking ship sending out his S.O.S. messages until the last moment, is founded on the earlier tradition that the Captain does not desert his ship while it remains afloat; and that during the War the deeds of "Q" boat crews are actuated by the same stern sense of duty that animates the older naval and military services; yet the fact remains that the individual traditions are of recent origin. Our own Service, though generally regarded as a latter-day institution, is really almost middle-aged, for the Service as such has been recognised for nearly 50 years, and it is my submission that we have in this time built up, by example, precedents that are entitled to rank and should be accepted as honourable and worthy traditions, so that we and future generations of telephone men and women may be inspired to endeavour to maintain these standards of service rendered without regard to personal sacrifice on the one hand or personal advantage on the other.

But here, perhaps, we should be well advised to pause and to consider how this matter will appeal to the younger generation, for it may be necessary to exercise care in this somewhat irreverent age not to over-emphasize the virtues of our predecessors.

It is perhaps fortunate that the example which I would choose to put first of all our traditions is one that has been continued right up to date and is still being fully maintained. This question of preference is, of course, a debatable one, but I would like to suggest that the tradition that should stand first and foremost in our regard is this:—

The expenditure of effort without restriction or reserve in dealing with the requirements of the traffic load to be handled.

It is my experience that at all times in the history of the Telephone Service of this country, no matter how adverse the conditions, abnormal loads, exceptional shortage of staff and sometimes equipment, there has been no faltering—the service requirements are met to the full limits of the telephonists' endeavour.

This might be held to be an obligation imposed on all who are engaged on urgent work for the public at large, and it is true that telephonists have no monopoly of loyalty to the public, but I believe that in respect of the quality of the response they make to the demands of the service, telephonists as a body have established a standard of which they have every reason to be proud, one which will bear comparison with any other public service, and it is for this reason that I would give first place to the development of this outstanding characteristic.

I am not, of course, referring to the special efforts required to meet particular occasions, some of which provide their own stimulus, although this is also a matter in which the staff can very well take pride in their achievements.

The full story of the work of the telephone staffs during the Great War remains to be told and is but little appreciated by the outside world. When it is told it will be an inspiration to all who follow in their footsteps to be ready for and equal to any emergency.

Present-day operating conditions during the lengthy transitional period of conversion from Manual to Automatic working require, if efficiency is to be maintained, the continuance of those qualities of unstinted application for which I have claimed we have established a tradition which should be given first place. Then we come to those traditional qualities of courtesy and promptness that operators have made particularly their own, and that striving for accuracy which comes so naturally to all honest craftsmen, and looking into the future it would seem to be fairly evident that—to put it concisely—the ultimate result of the conversion will be to rely on purely mechanical means for the establishment of the short distance and more straightforward types of call, and to rely on the telephonists for the more involved special services. In addition to this it would seem highly probable that we shall always have to cater for an appreciable amount of assistance calls.

From this we may deduce that although the operator of the future will deal with fewer calls than at present, each transaction will represent a much higher call value and will demand the exercise of intelligence and tact of a high standard. In these difficult days that are to come we may rest assured that the worthy traditions we have established will be fully maintained. The purely physical effort will perhaps be less, but the need for a willing spirit of devoted service will be present to a greater degree than ever before.

There is this further consideration. Can we afford to treat with this abstract subject of inspiration, operating ideals, call it what you will, in this manner, or are we, in effect, by attempting to classify our standards and labelling them traditions, merely being sentimental and endeavouring to claim credit for what is after all only the efficient performance of work for which we are paid—in other words, doing our duty.

My answer to any such criticism, if it were made, would be this:—

In all tasks of magnitude such as the efficient rendering of an important public service some inspiration is required to meet the day-to-day difficulties that are inevitably encountered. However devoted and zealous the staff may be, there will be progress and there will be retrogression or apparent retrogression, and it is during these latter disheartening periods that the value of a tradition may be best appreciated, in that it constitutes a rallying-point, a standard of achievement representing something that has been done, something that must not be surrendered, and something that if it be lost temporarily must be fought for and regained at all costs.

In this way a good tradition is an inspiration.

THE ST. JOHN AMBULANCE ASSOCIATION: LONDON POST OFFICE CENTRE (POST OFFICE AMBULANCE CORPS).

THE Annual Competitions for the London Postal Ambulance Challenge Shield and the Women's Trophy will be held on Wednesday, Nov. 20, 1929, at 7.30 p.m., in the King George Hall, Caroline Street, Great Russell Street, W.C.1. Admission is by programme—threepence—and a limited number of seats will be reserved at 1*s.* each.

Please help us by buying a programme or a ticket, and so show your appreciation and interest in the work done by the Centre.—Miss E. K. M. Meeser, Controller's Office, L.T.S., Cornwall House, Waterloo Road, S.E.1, Mr. J. E. G. Rogers, I.S. Mount Pleasant, E.C., *Joint Competition Secretaries.*

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Low-Lying.

WERE I to commence this article in a conventional manner I should do so by saying "I must confess that I like lying on the floor." But this gambit is open to several objections. Firstly, there is, as far as I know, no compulsion at all in the matter. No one has asked me my preference as to the disposal of my body. Indeed, each of you will have already decided in your own mind the appropriate action to be followed immediately the first favourable opportunity presents itself, and when that moment arrives my only concern will be to dispose myself with comfort and with a speed which precludes explanation. Then, why should I confess? Confession implies conviction of a secret virtue or vice and it may be made humbly or defiantly and voluntarily or under compulsion. Lying on the floor is neither a virtue nor a vice—it is only a confounded nuisance to other people in the room. My recumbent attitude is no secret, for I have been discovered lying more than once and, unless an agonised yelp can be construed as such, I cannot be said to have confessed either humbly or defiantly. To avoid any misconception let me add that when I do lie on the floor I do so of my own free-will and not under the influence of a *force majeure* or inebriation. If you insist that to lie on the floor must be either a virtue or a vice, then I claim it as a virtue. Item, it leaves the easy-chair free for someone else; Item, it is morally better than any other sort of lying; Item, like foreign travel, it broadens the mind and at a smaller cost. To be trodden upon once whilst lying on the floor broadens whatever part comes under the clumsy hoof of the passer-by. To be trodden upon on the second occasion broadens the vocabulary both of the "treader" and the "treadee." Subsequent treadings merely teach wisdom and are in no way interesting.

In the low-lying attitude I find that unusual thoughts are prompted on usual subjects. I see the world from a new angle. Normally I cannot contemplate the presence of a cup of tea, a book and a pipe on the floor with any degree of equanimity, but when I am on the floor what more natural position for those articles could be conceived? The carpet raises burning topics in my mind. I wonder whether the minsters at Ax and Kidder are built in the Gothic, Romanesque or Grotesque styles, and I conjure visions of Turkey and Persia with perhaps side-thoughts of delight and sherbet or cats and Omar. I am vaguely puzzled about mohair and as to what is a Mo and whether in any part of the world there is a herd of hairless Mos. The table is no longer a plane polished surface hung miraculously in space and set with fine linen and china. The dominant fact now is that it has legs which spiral with Jacobean twist up to a vault of cunning contrivance. I see that the chairs, so far from being merely articles upon which to sit down, are works of wondrous skill which compel an upward glance of appreciative admiration. I regard the carpenter now with an added respect. The ceiling is a wider and whiter expanse set at an immense distance, and it flows away to an horizon which never seemed so limitless. If I gazed long enough surely the stars would appear. From the floor I can see the real sky, blue and with fleeting white, the waving tree tops, the rooks going home. But those who are upright see only the flat face of the house opposite, with its painful curtains and its respectable aspidistra, and the new hat of its less new owner. They see also the hedge in the front garden which I should have trimmed were I not lying on the floor in idle contemplation. Alas for the vision of the upright. Shall I abandon my low-lying for this vision of the truth or shall I lie low!

PERCY FLAGE.

A Tribute.

(With apologies to Mr. Angus McDonald!)

Oh, sad were our hearts as we pored o'er the map
At the news of our Editress' motor mishap—
And tears of compassion fell fast down our bibs,
When we heard she had fractured quite three of her ribs!

Oh, dear Miss McMillan!—our grief is sincere—
We skip half the *Journal* since you are not here,
To brighten Our Page when contributors pall,
And curb Percy Flage' flights of fancy withal!

And yet, with dear Percy, humbly we pray
You'll be soon "on the mend"—as the cobbler would say.
We long for the day when at length you will be
Entirely unable your bruises to see!

And then, what a cheer!—what a cheer you will hear
From hundreds of maidens and men;
When at last they behold their Pet Playwright again!
The chaplets are waiting, and garlands by the score
To welcome our Jean to her empire once more!

C. A. S.

Our Portrait Gallery.

[*Photograph by Navana.*

No. 3.—MISS A. JUDGE.

Miss A. Judge started her career in the National Telephone Company. Her marked ability resulted in her early selection for special work, and her records show that after six years' service she had attained to the position of an Assistant Supervisor in the operating school, a position which she filled for 14 years and which she held at the time of the Transfer.

She now holds the position of senior interviewing officer, one for which her good judgment, power of quick decision and sympathetic outlook render her specially fitted. She has the inestimable faculty of being able to put the most nervous and hesitating applicant at her ease.

Her cheerful disposition and ready wit endear her to her colleagues, and the able manner in which she undertook and carried through the work of General Secretary of the L.T.S. Christmas Fair of 1928 is typical of all she does.

Outside the office she is keenly interested in amateur theatricals and operatic performances, and has in her time played many parts.

Holborn: Some Impressions.

"Are you transferred to Holborn for good? Do you think you will like it? Don't be afraid to ask anything you want to know, we've all had to learn the work."

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The smiling faces of the Supervisors, who seem well versed in the art of coaching novices, the light, airy switchroom, the tap-tap of the keysenders and the humming of the dials, this is my introduction into the subscribers' Paradise—an Automatic Exchange.

Will I find it monotonous after a busy section in a manual exchange? It looks so simple, what can one exercise one's brain upon?

A few days pass, I feel that I have mastered the most intricate part of the business, but "Pride goeth before a fall."

"Good morning," says a voice at my side, "How is the contact on the seventh level getting on?"

How should I know? I cannot see a contact getting on a level, and, come to that, how do telephonists discover what is happening in the apparatus room?

I say something non-committal and the owner of the voice passes on, but I think over the matter without reaching any satisfactory conclusion. At last I decide to seek advice and ask a colleague the question which has become almost a standard expression to me—"How is the contact on the seventh getting on?"

"Oh," she says, "That's all right, my dear, it's not on now, it's off. The First-Class Supervisor has been advised." Now tell me, readers, am I any nearer to the solution to the problem?

Ah! a keysender "B" section is the place for me! No snares, nothing to think about, what more could anyone wish for? A docket is placed in my hand with this legend inscribed upon it: "Hol 0000 complains other subscribers advised engaged, our subscriber disputes." Now I *am* on sure ground! Have I not dealt with complaints of this nature in a manual exchange? I walk briskly up to the telephonist concerned and say "Do you remember giving the engaged signal for Holborn 0000 at all this morning?" The telephonist does not turn a hair, she does not even smile, she merely states in a dignified manner: "We cannot connect engaged signals, we can only tap out numbers and watch the Sender Finders."

One is reminded that the "Wind is tempered to the shorn lamb" as one watches the happy School Supervisor teaching, helping, and advising the staff in training; they keep the maidens from incorrect dialling and guard the shepherds who watch over the exchanges by night. How Holborn will miss them when they find other pastures.

What excellent guides the Holborn Supervisors would make—I mean the experienced ones—they recite the "Procedure" to the increasing flow of visitors from other exchanges, who listen with attention to every explanation given.

Then there are the telephonists, they work, swim, dance, sing, learn "First Aid" and are what one might term—really alive.

Can such a place ever become monotonous? I wonder whether it will still be interesting in 20 years' time? But I do not think I shall remain at Holborn so long as that. You see, I am the 13th Supervisor on the list, and my "handset" and "headset" are both *number* "13."

G. M. T.

Queen's Hospital, Sidcup.

The closing, on Oct. 12, of the Queen's Hospital, Sidcup, has brought to an end a fund which has been a labour of love to the staff of the Gerrard Exchange and their friends for over 10 years. The Hospital was opened

QUEEN'S HOSPITAL, SIDCUP.

in 1917 and has since become known throughout the world for the wonderful work performed there by Major H. D. Gillies, and surgeons trained by him.

To this hospital all bad cases of facial wounds were drafted from Naval and Military, and miracles of facial surgery were performed, so that the majority of the patients have been able to take their places again among their fellows. Nearly 20,000 such patients have passed through the hospital, many of them having spent years there, and some of those who have suffered most say that they have spent some of their happiest years at Sidcup.

Towards the end of the war the Gerrard staff decided to adopt this hospital for their special care. A fund was started and a party went along one Saturday and gave a tea to the whole hospital—over 500 patients—followed by a dance and entertainment. This fund has been maintained ever since, newcomers to Gerrard joining in enthusiastically, and Gerrardites transferred elsewhere continuing their interest, while friends have helped in all sorts of ways. A total amount of £1,087 9*s.* 6*d.* has been collected during this period, all of which has been spent on entertainments and comforts for the patients. About two years ago funds were badly needed to maintain and develop the wireless installation, and collections were made in aid of this good object by Victoria, Air Ministry, Park, Grosvenor, Wimbledon, and Chiswick Exchanges.

The remaining patients, about 60, are being drafted to Roehampton, and each of them has been presented with a warm cardigan and muffler. The balance of the fund, just on £30, has been handed to Mr. Baker, the Chief Clerk of the Sidcup Hospital, who will keep in touch with them, and use the money for additional comforts which they may need. One of the things which have impressed visitors to the hospital has been the keen interest in their work shown by all the hospital staff. Colonel J. R. Colvin has had charge of the hospital since it opened; Mr. Baker, the Chief Clerk, came for 6 months only, and stayed 7 years; while many of the nurses have worked there throughout the 12 years of the hospital's existence. Miss James and Miss Roe have been Chairman and Secretary of the Gerrard Committee for the whole period of the Fund, and they wish to express their grateful thanks to all who have supported them. In particular, they appreciate the very useful co-operation of Bridgers, of Hammersmith, who did all the catering, and the continued help and interest of Miss Cox, Mr. Pounds, Mr. Buckeridge, and Miss Etheredge.

Contributions to this column should be addressed: THE EDITRESS, "Talk of Many Things," *Telegraph and Telephone Journal*, Secretary's Office, G.P.O. (North), London, E.C.1.

LONDON TELEPHONE SERVICE NOTES.

Presentation to Mr. Stirling.

THE Conference Room at Cornwall House was well crowded on Thursday, Oct. 10, when members of the staff of the London Telephone Service assembled to wish Mr. Stirling good luck on his retirement from the post of Assistant Controller.

In addition to a good representation from the Accounts, Contract and Traffic Branches, many old colleagues attended amongst whom were Mr. J. F. Edmonds (Secretary's Office), Mr. A. H. Hudson (Ministry of Pensions), Mr. R. Bryson (retired), and Mr. W. R. Birnie (A.G.D. Auditor).

Mr. Napier, in making the presentation of a gold watch, binoculars, and several well-chosen volumes, paid a tribute to Mr. Stirling's capacity for "putting his thinking cap on."

After Miss Liddiard had expressed the esteem of the female staff, Mr. Stirling amused the gathering, in returning thanks, with a few personal and official impressions and visualising the evidently pleasing prospect of wintering in sunny desert climes.

* * * *

Contract Branch Notes.

The business done by the Contract Branch during the month of September resulted in a net gain of 2,768 stations as compared with 2,676 last year. The total net gain for the quarter amounted to 10,758 stations against 9,622 last year.

New orders in the City are very difficult to get just at present as everybody seems anxious to know the extent of the reverberations of the Hatry case before they launch out in any new expenditure, and a number of subscribers seem anxious to reduce rather than increase their installations. The increased Bank Rate also has tended to produce a cautious attitude.

There were 320 exhibitors at the Shipping and Engineering Exhibition this year, and 123 of them rented lines as compared with 112 lines for 288 exhibitors last year. Orders for 118 lines were obtained from the 192 exhibitors at the Wireless Exhibition as compared with 107 lines for 183 exhibitors last year.

The number of exhibitors at the Motor Show this year is 525 as compared with 547 last year, and up to the time these notes go to press orders for 383 exhibition lines have been received as compared with a total of 399 last year.

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The number of exhibitions seems to be increasing, and some of those that are coming on cover very different fields as indicated by the following titles: "Hairdressing," "Inventions," "Medical," "Radiological," and "New Health."

* * * *

L.T.S. Bowls.

It cannot be claimed that the London Telephone Service have in the past particularly impressed the sporting critics of the Service with their achievements in the many branches of sport indulged in, and until the formation of the Bowls section in 1927 the L.T.S. was not regarded as a serious contender for any of the Civil Service honours.

In three seasons, however, the Bowls section have attracted considerable attention by providing the winning rink in the London Area competition, which also represented England in the International tournament at Cardiff last year, and this season they have headed the league, and succeeded in winning the "Bunbury Cup" by beating the Admiralty in the final tie played at Chiswick on Sept. 26, 1929. It was a severe test to be called upon to play the Admiralty in such an important game. The Admiralty had displayed wonderful form throughout the season, and one gathered from the whisperings round the green before the match commenced that the favourites were certainly not the L.T.S.

This did not seem to affect the L.T.S. who, no doubt, were well aware that favourites have before failed to land the "spoils." The strength of the opposition only served to increase the determination of the supposed weaker side, and ably led by the skips., Messrs. Livermore, Cleland, and Heard, the L.T.S. went to the front from the beginning and never relaxed their grip on the game.

The importance of the encounter was reflected in the unusual stillness of the atmosphere, the early part of the game being played with a grimness seldom experienced in ordinary league games.

The match was witnessed by many Service enthusiasts and was distinguished by the presence of Mr. A. V. Alexander, M.P., First Lord of the Admiralty, and Mr. C. G. Ammon, M.P., Parliamentary Secretary to the Admiralty.

The scores are given below:—

L.T.S. v. *Admiralty.*

1.	Messrs. Grove, Evennett, Gregory and Livermore (skip.)	26	Messrs. Stevens, Veness, French and Kenyon (skip.) ...	24
2.	Messrs. Hutchison, Dickinson, Weaire, and Cleland (skip.) ...	28	Messrs. Olford, Partridge, Puddey and Pelling (skip.)	23
3.	Messrs. Mantle, Collins, Demment and Heard (skip.)	42	Messrs. Lomax, Wilson, Rolls, and Bernthal (skip.) ...	8
		96		55

* * * *

L.T.S. Football.

The Club commenced the season with a rousing victory over the War Office on the last Saturday in September by 5 goals to 1. The match was played at a good pace throughout and the victory was mainly due to the better finishing of the L.T.S. forwards.

On Oct. 5 the Taxes were met on the latter's ground, the result being a draw of 4 goals each.

Dollis Hill, a very successful team in last year's competition, were played at Chiswick on Oct. 12 and provided us with another victory by a margin of 4 goals to 1. It was a finely contested game, particularly in the first half, when some good football was shown by both sides, and it was Futerman's fine shooting—he obtained 3 of the 4 goals—that really turned the tide and enabled the L.T.S. to annex another two points.

Dollis Hill are a nicely balanced team and put up a very good fight, and the final result hardly represents the difference between the two teams. The L.T.S. defence was very sound under pressure.

The matches to be played in November are as follows:—

Nov.	2.	Land Registry ...	Home.
„	9.	Customs	Away.
„	16.	Taxes	Home.
„	23.	Ministry of Health ...	Away.
„	30.	Board of Education ...	Home.

* * * *

London Telephonists' Society: Presidential Address—"The Value of Tradition."

It is a tradition of the London Telephonists' Society that the opening meeting of the Session shall take the form of a Presidential Address; and the success attending the first meeting of the present Session on Friday, Oct. 4, furnishes another instance of the value of tradition.

(Mr. Mantle's paper appears in abridged form in another column.)

An animated discussion, in which a rapid succession of speakers participated, showed that Mr. Mantle's subject had aroused wide interest. Nearly all supported his main contention that tradition plays an outstanding part in the attainment of efficiency—though one bold iconoclast advocated a complete breach with tradition! Rarely has any subject produced such a ready debate; and though, in spite of Bailey's "Festus," we do live in figures on a dial and count our time in milli-seconds instead of heart-beats, the response of the audience to Mr. Mantle's paper showed that, happily, we may still invoke the aid of tradition.

* * * *

L.T.S. Sports Association.

Swimming.—The Eleventh Gala was held at Pitfield Street Baths on Oct. 11. The Founder, Mr. E. A. Pounds, and the officials of the Swimming Association are to be congratulated upon such a successful event. There are 38 clubs in the Association with a total membership of 1,600, the largest organisation of its kind in the country. These figures may appear astounding, but those of us who attended the gala and saw tiers upon tiers of packed seats, reaching up at one end of the bath to the ceiling, are not surprised at such a large membership. Although the time of commencement was advertised as 7 o'clock, owing to the number of entries preliminary heats were started at 6 o'clock. The 33⅓ yds. handicap drew no fewer than 144 entries, and these had to be divided into 24 heats. A result was, however, finally reached, the placing being as follows:—

1st.—Miss Campbell, Kensington.
2nd.—Miss Woodley, Willesden.
3rd.—Miss East, Bishopsgate.
4th—Miss Parfitt, Primrose Hill.

The team race for the Pounds Challenge Cup followed. Here was the most exciting event of the Gala. Twenty-nine exchanges entered representative teams of 4 swimmers.

As the race progressed the cheering of the supporters was simply deafening, and the swimmers were no less excited. One could see that each team was straining every effort to secure the treasured trophy for their exchange, and the following indicates the close fight that resulted:—

1st.—Regent, 1-37.2.	4th.—Victoria, 1-42.3.
2nd.—Gerrard, 1-40.	5th.—Clerkenwell, 1-50.4.
3rd.—Trunks, 1-40.3.	6th.—Avenue, 2-5.

In the preliminary heat Regent swam the distance in 1-34.2 and Gerrard 1-37. The judging in this race called for considerable alertness and skill and the officials are to be commended for the minute accuracy of their timing.

The result of the sealed handicap was:—

1st.—Clerkenwell, dead heat.
2nd.—Streatham, one-fifth second out.
3rd.—Holborn, three-fifths second out.

Another interesting competition was the Learners' Race for "Agnes Cox" Cup. There were 32 entrants and the result was:—

1st.—Miss Hiscock, Regent.
2nd.—Miss Smith, Primrose Hill.
3rd.—Miss Jones, Paddington.
4th.—Miss Rymer, Museum.

The surprising feature of this race was the efficiency of some of the learners, and speaks well for their training during the summer months.

Next followed the L.T.S. Breast Stroke Championship. There were 5 heats, made up of 27 competitors.

The final resulted as follows:—

1st.—Miss House, Regent.
2nd.—Miss McBirney, Trunk.
3rd.—Miss Palmer, Regent.
4th.—Miss S. Wilson, Gerrard.

This is always an interesting race, and the winner not only displayed superiority in speed but her style was very graceful. An excellent example to some of the other competitors.

Four teams entered for the L.T.S. Men's Race for the Prosser Cup. "A" Team, comprising Messrs. Pettigrew, Frier, Armstrong and Bishop, won the Cup, Mr. Frier finishing in fine style.

The Supervisors' Race of one length was won by Miss Daves (Trunk), followed by Miss McNee (Avenue) 2nd, and the 3rd was Miss Lloyd (Bishopsgate).

A polo match was played between the Post Office and the rest of the Civil Service, which resulted in a win for the P.O. 4-1.

The A.D.A. high and fancy diving was exceedingly well done, and evoked much applause.

A report of the gala would not be complete without again referring to the efficient manner the various officials carried out their duties.

* * * *

Lawn Tennis.

The competitions for the Agnes Cox Cup and the one presented by Mr. and Mrs. Pink have now concluded. Clerkenwell, the original holders,

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regained the former and Miss Wilson, representing A.R.1 Section of the Accounts Branch, the latter.

Both finals were played at Regents Park and on each occasion the donors of the trophies were present.

* * * *

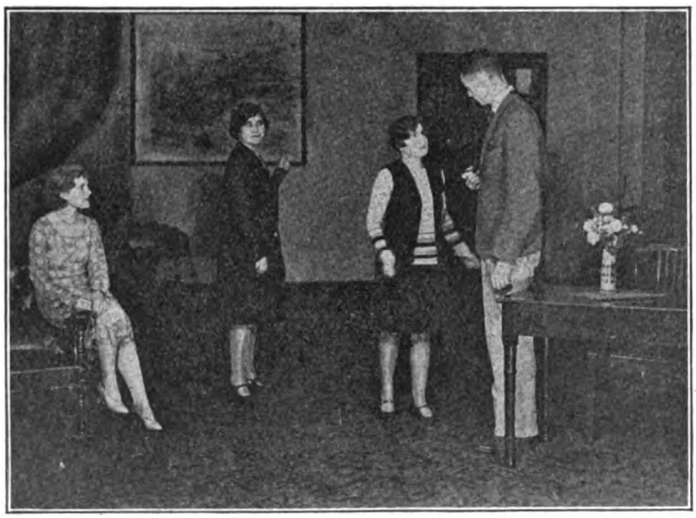
Stamford Dramatic Society.

On Oct. 8, at the Cripplegate Institute, we had the pleasure of being present at the Stamford Dramatic Society's first play in their second season. Having watched with interest the progress made by the Society since its formation, we were not surprised to find that their latest production was of a more ambitious nature. One of the earlier works of Noel Coward, "I'll Leave it to You," is a light satirical comedy, showing the amusing behaviour of a youthful family when their ambitions are stirred by their uncle's promise to leave his fictitious fortune to the one who achieves most success. Differing from "Tilly of Bloomsbury," the Society's last play, which was borne along on an air of sentimentality and boisterous humour, "I'll Leave it to You" requires a slickness and facility in dialogue which can only be obtained with considerable dramatic experience. We understand that the play was produced in an unusually short space of time, and bearing this in mind we congratulate the Society on the success of their very creditable enterprise. Were there one or two slight mishaps, they were such as might have been apparent only to one acquainted with the play; incidentally, we seem to remember, when we last saw the play, an amusing quarrel between Bobbie and Oliver in the breakfast scene; at the Cripplegate Institute we wondered why this little flare of misbehaviour, an index to the domestic situation, had been omitted.

We were pleased to see how enthusiastically Henry Dean, in the part of Uncle Daniel, was received. From the outset he maintained our interest with the unstudied humour he gave to the character. Mrs. Dermott, the doting mother of the four expectant legatees, was played by Louisa Curtis, whose versatility in the display of emotion found natural expression.

Kathleen Goff, as Sylvia, the most engaging of the children, found quick favour with her delightful air of sincerity.

Bobbie, Sylvia's witty and nonchalent brother, was elegantly played by Frederick Crossley, and the increase of confidence which he showed was an added asset to his former acknowledged ability. His display at the piano showed a musical talent which was new to us. The subtlety of expression in Eveleen Brereton's accomplished performance as Mrs. Crombie evoked much laughter, and we could have wished that she had appeared more often.



"SOMETHING WONDERFUL HAS HAPPENED, OLIVER. WE'RE RUINED!"
(*I'll Leave it to You.*)

The part of her daughter, Faith, Bobbie's charming but mercenary sweetheart, was played well, though somewhat ingenuously, by Freda Bruce. Of the rest of the children, Evangeline, the eldest and intellectual, was skilfully played with mock dignity by Vere McKenzie; the character of Joyce, the schoolgirl, received freshness and happy irresponsibility from Phyllis Lee; and an amusing brusqueness was given to Oliver, the eldest son, by Maynard de Borde, who, however, seemed scarcely so much at home in this indefinite part as when we saw him last in clerical garb. David Smith, as Griggs, was an efficient and unobtrusive butler.

It was apparent that the play had been given careful and skilled direction, and we consider that the Society owes a tribute to their producer, Mr. David Noble. The orchestra, comprised of members of the Service, and conducted by Mr. J. Curr, A.C.V., provided light music, which was much appreciated.

The Society has every reason to be satisfied with its latest achievement, and we are looking forward to a pleasant evening on the occasion of their next production.

GLASGOW TELEPHONE NOTES.

MISS ALICE F. CAMERON, the subject of our sketch, entered the service of the National Telephone Company as an operator on Mar. 20, 1893. Promotion not being so rapid as Miss Cameron desired, she "joined up" in the Corporation of Glasgow's service in March, 1901, as Second Chief Operator, and in June of the same year attained to the rank of Chief Operator.

MISS ALICE CAMERON.

Five years later the Corporation transferred its telephone system to the Post Office and Miss Cameron then entered the service of the State, being appointed to a Supervisorship in June, 1907, which position she has filled with distinction ever since.

Miss Cameron is at present in charge of the Glasgow Central Exchange and, as the Senior Supervisor of the District, has duties allotted to her other than the control of the staff at this important centre of Glasgow's telephone activities. For example, she is a member of the Committee which interviews and selects for nomination the most suitable of the many applicants for girl probationer and telephonist posts. The present-day standard of the Glasgow telephonist is due in no small degree to her discrimination and judgment.

Miss Cameron is a worker in a very practical sense. She is a most popular officer and makes many friends wherever she goes. Her activities are not restricted to official duties, for they find vent in many and varied acts for the common good; the fact that these are not advertised detracts in no way from their value, rather the reverse, in fact. Work is not her only hobby, however, for she is fond of country walks and, so rumour hath it, is rather partial to an annual joust with Father Neptune and the more "windy" he is the better Miss Cameron is pleased.

Mr. J. Dick, lift attendant at the Wellington Street Office, has left his homeland for America. By his fellow workers, friends in the Central Telephone Exchange and Parcel Post, Mr. Dick was presented with a gold timekeeper, and a travelling rug for Mrs. Dick. A pleasant evening was spent at the Kenilworth Hotel on Friday, Sept. 20. Mr. Dick was given a good send off.

We wish him a happy voyage and a successful career in his new venture, and trust that his "ups and downs" in life are over.

Congratulations to Miss E. McBeth, telephonist with supervising allowance, on her promotion to an Assistant Supervising post, Class II.

It is gratifying to learn that the subscriptions to the Glasgow Post Office War Hospitals Entertainments Committee made by the Telephone Branch for 1928-1929 reached the sum of £87 1*s* 5*d*., an increase of £11 over the amount collected for 1927-28.

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Bell Golf Club Autumn Meeting on Sept. 20, 1929.

1st.—W. Campbell.
2nd.—J. Gibson.
3rd.—J. A. Matheson.

Such is Fame!

Referring to a case of abusive language on the part of a subscriber, a Glasgow Officer writes:—

"The language he used was . . . I cut him off. . . . Exchange again put him through and I suggested that he could lodge a complaint with the . . . Superintendent on duty. *His reply to that would make any Superintendent blush!*"

Why a Superintendent particularly?

"Lectures on the telephone are being offered by the District Manager of Telephones in Glasgow. Personally we find we get enough lectures on the 'phone, having unfortunately connected our place of employment with our place of residence."—(*Glasgow Evening News.*)

Calls made during period house was closed. Line signal glowed and when operator answered someone passed a call. Operator said "I thought this house was closed." Calling party answered "Yes, but I'm the next-door neighbour. I come in to water the flowers."

Contract Branch Notes.

The Money Magnet.—The brighter prospects now possible in the commercial world continue to attract our younger officers. Following closely on the resignation of our esteemed colleague, "Bill" Norris, came the departure of our tall friend Thomas Coyle.

Our good wishes (and a cigarette case and wristlet watch) went with these two lads.

The G.O.D.'s.—We rejoice to learn, as the Vicar of Mirth would say, that Glasgow's Own Development Officers who have been transferred and lent to other districts are doing well.

Jas. Blackwell has returned from Liverpool owing to distress at home.

Our travelling sample of cheerfulness, J. F. Brodie, paid us a visit on his way from Aberdeen to Nottingham. We envy him having spent so much of the summer at Whitley Bay and the Granite City.

Reiditski says:—The Contract Officer's sure road to success is "Station" Road.

THE POST OFFICE TELEPHONE AND TELEGRAPH SOCIETY OF LONDON.

SESSION 1929-1930.

THE opening meeting of the Session was held on Monday, Oct 21, at the Institute of Electrical Engineers, Victoria Embankment, W.C.2, when Mr. H. E. Powell-Jones (Secretary, Telephone Development Association) gave an address on "Work and Methods of the Telephone Development Association." Mr. F. W. Phillips (Assistant Secretary, Overseas Telegraph Branch), the Chairman for the session, presided. Prior to the meeting, from 5 p.m. to 5.30 p.m., tea and light refreshments were provided for members and visitors in a room adjoining the Lecture Hall.

(It is hoped to print Mr. Powell-Jones' paper in the next issue of the *Journal*.)

Particulars of the other meetings during the Session are as follow:—

Meeting Place—Institution of Electrical Engineers.

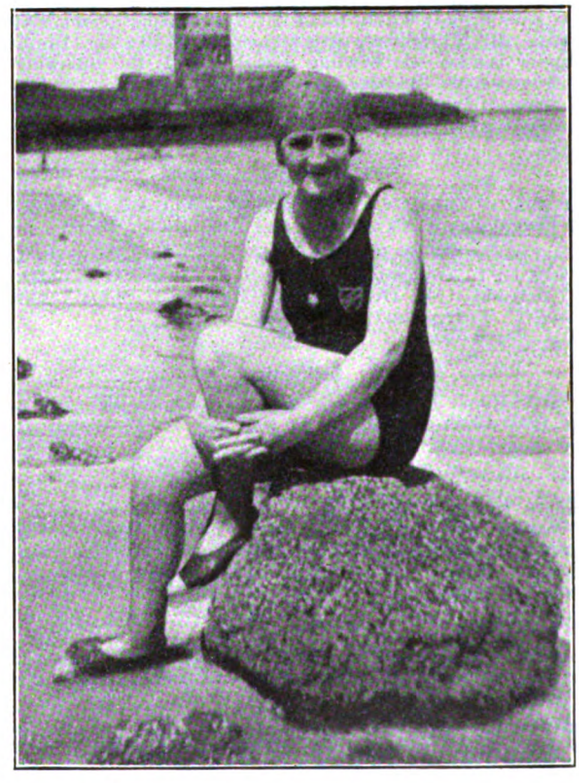
1929. *Monday.*		
Nov. 18.	"Wireless Aids to Navigation."	Mr. F. Addey, B.Sc., F.R.A.S., M.I.E.E. (Wireless Telegraphy Section, Secretary's Office, G.P.O.).
Dec. 16.	"Work of the Research Section, Engineer-in-Chief's Office."	Mr. S. A. Pollock, O.B.E. (Engineer-in-Chief's Office, G.P.O.).
1930.		
Jan. 20	"Aspects of Industrial Psychology."	Major G. H. Reid (Royal Air Force).
Feb. 17.	"Transatlantic Telephony."	Lt.-Col. A. G. Lee, M.C., O.B.E., M.I.E.E. (Assistant Engineer-in-Chief, G.P.O.).
Mar. 17.	Open Debate: "How to Improve the Telegraph Service."	Discussion will be opened by Mr. L. Simon (Assistant Secretary, G.P.O.).
April 7.	"Picture Transmission."	Mr. E. S. Ritter, D.F.H., M.I.E.E. (Engineer-in-Chief's Office, G.P.O.).

All members of the staff of the Post Office are eligible for membership on approval by the Committee. The annual subscription, payable in advance, is 1*s.* 6*d.* for women and 2*s.* 6*d.* for men. Application for membership should be made to the local agent or to the Hon Secretary, Mr. A. J. Wadey, Secretary's Office, G.P.O. North, E.C.1 (Central 3600, Extension 768).

DORIDE LADIES' SWIMMING CLUB.

THE thirteenth annual display of this Club, formed of members of the A.G.D. staff, was held at Holborn Baths on Oct. 18 last. The principal events were:—

Sir Charles King Challenge Cup (100 yds. Championship).—1. Miss Deighton. 2. Miss Banger.
Two Lengths Handicap.—1. Miss Coleman. 2. Miss Law.
One Length Handicap.—Miss V. Smith.
Diving Championship.—1. Miss Coleman. 2. Miss Langham.
Schneider Trophy.—Miss Matthew and Miss Banger.
Ladies' Invitation Race.—Ministry of Labour (Kew).



MISS DORIS DEIGHTON, WINNER OF SIR CHAS. KING CHALLENGE CUP.

There were several pretty and entertaining items on the programme, including a League of Nations Race, a Flower Show, Huntsman and Fox Obstacle Race, a Life-Saving Display, a Cat and Canary fight, a Historical Costume Race and others. The Lantern Team Race, won by Miss Banger's team, was a particularly effective item, and the fancy costumes generally reflected great credit on the contrivers of them. Miss Sanday, O.B.E., presented the prizes.

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C.T.O. NOTES.

Promotions.

Misses E. F. Duncan, Supervisor to Supervisor (Higher Grade), A. F. Smith and M. T. Tynan, Assistant Supervisors to Supervisors.

Retirements.

Messrs. J. E. Barrett, W. A. Cox, F. W. Martin, Telegraphists, Misses A. M. Finch, Supervisor, Higher Grade, M. McLaren, Supervisor, and A. M. Messeder, Telegraphist.

Music.

The Centels Operatic Dramatic and Orchestral Club, on Wednesday and Thursday, Oct. 9 and 10, gave delightful performances of Messager's light opera, "Veronique," which were well attended and thoroughly enjoyed. The name part was admirably played by Miss Winnie Lenthall, and her duets with Mr. C. G. F. Blundell, as "Florestan de Valiancourt," were very pleasing. Mr. Blundell, although badly handicapped by a cold, made a very successful first appearance. Miss Florence Penniceard's "Ermerance" made one feel that her grand manner was a thing to be feared. Mr. Bertie Figg, as "Coquenard," was able, perhaps for the first time, to play his part in his own manner, and was thus able to give a notable performance. Miss Ivy Clarke, as "Agatha" (Coquenard's wife), provided just sufficient contrast to depict the waywardness necessary. Mr. A. W. Haddock, as "Seraphim," the groom, Miss Marie Thornton, as "Denise," and Mr. Arthur Boyce, as "Loustot," gave very good performances, and completed an efficient cast.

The chorus work, especially the dancing, was a matter for sincere congratulation, and the orchestra, under the direction of Mr. Arthur Brough, was thoroughly adequate.

The Dramatic Section's first performance of the season is "Ambrose Applejohn's Adventure," and will be given at King George's Hall on Dec. 3 and 4.

Sport.

Cricket.—The Centels can say they had a successful season, having played 20 matches, won 10, lost 6 and drawn 4. The batting averages were headed by the Captain, Mr. T. Hellicar, with an average of 29.1 for 11 innings, whilst Mr. A. Pepper headed the bowling averages with the following analysis: 136 overs, 24 maidens, 408 runs, 40 wickets, 10.2 average runs each wicket. The "A" team of the Cable Room won the C.T.O. Divisional League with 21 points out of a possible 24.

Bowls.

In the final of the C.T.O. Pairs Championship, Messrs. L. J. Small and H. J. Cook beat Messrs. E. C. McCartie and T. G. Donno by five shots, 22-17.

The final of the C.T.O. Rink Championship was won by the Controller's Office (Messrs. G. T. Archibald, A. Faull, R. C. Cross and T. G. Donno), who beat the "E" and "F" Division rink (Messrs. G. Defoe, G. Nason, E. C. McCartie and C. T. Drywood) by 16-13.

Swimming.

The Cable Room held a very successful Swimming Gala at Holborn Baths, the Club Championship being won by Mr. McGenis.

Obituary.

We regret to record the death of Mr. W. J. Jones ("Taff"), a much respected man of sterling qualities, whose sudden and unexpected death came as a shock to his many friends. To his widow (who was one of us) and son we extend our deepest sympathy in their sad loss.

Rambles.

The members and friends of the "F" Division Rambling Club took as a route for their final ramble, Oxshott, Ashtead, and Epsom, and had a most enjoyable walk.

Oxshott Common, Ashstead Woods and Epsom were also favoured by the Night Staff for their last ramble, and a glorious day spent in these parts went all too quickly.

Art Exhibition.

The C.T.O. Art Society held their Fourth Annual Exhibition during the week ending Oct. 18. The exhibits were much admired. The judges were: Art—Mr. E. J. Halliday, R.S., A.R.C.A.; Photography—Mr. S. Brigden, R.P.S.; and Crafts—Miss W. Tuckfield. The Justins Award for painting was granted to Mr. S. E. Morton. Mr. A. J. Ginger took the first prize for black and white. Mr. F. A. Christopher holds the Bigmore Award in the Photographic Section. Miss Anglesea took first prize in the Art Needlework Section, whilst Miss F. E. King won the first prize for Craft Work. Mr. H. Davey won the special prize given by Mr. D. M. Ford, Deputy Controller, for all-round merit. It was very pleasing to notice exhibits by boy messengers and it is hoped that the membership of the Society will increase. The exhibition was well attended throughout the four days it was opened.

PLYMOUTH TELEPHONE GIRLS' SWIMMING CLUB.

SINGLE-SIDED RACKS.

IN the article on the new Metropolitan and National Exchanges in our October issue, a paragraph appeared regarding the introduction of Single-Sided Racks and referring to racks of this type as a "novel feature."

Since this may give rise to a wrong impression it should be stated that single-sided racks have been installed in many of the Department's other automatic exchanges, for example, in those supplied by Messrs. Siemens Brothers & Co. from very early days. The expression "novel feature" referred particularly to their use in other Strowger equipments.

A.G.D. SPORTS ASSOCIATION.

THE next dance arranged by this Association will be held at Lever House, Victoria Embankment, on Monday, Dec. 2. Tickets, 2*s.* 6*d.* each, can be obtained from the various officers of the Association.

GLOUCESTER.

MR. R. S. GROSVENOR, Traffic Superintendent, Class I, South Wales District, was recently the guest of the Gloucester District Office Staff, when he was presented with an oak bureau "in happy remembrance"—as the inscription on the plate had it—"of his stay with Gloucester folk." The presentation was made by the District Manager, Mr. J. H. Storrie, before a large gathering representative of all sections of the Postal, Telephone, and Engineering Branches. The District Manager, in congratulating Mr. Grosvenor on his preferment to the higher class at Cardiff, made feeling reference to the excellent co-operation between the various departments which had prevailed during the three years he had spent at Gloucester.

Mr. Grosvenor, in a characteristic speech, returned thanks not only for the tangible expression of goodwill but also for the very lively assistance he had received from everybody in the district. His only regret was, he said, that his promotion necessitated his leaving his Gloucester friends, of whom he would always retain the very happiest memories.

PRESENTATION TO MR. A. BARKER, SOUTHAMPTON.

ON Sept. 17 last a large number of his colleagues gathered in the District Manager's Office to say an official goodbye to Mr. A. Barker, Assistant Traffic Superintendent, who left to take up his appointment as Traffic Superintendent, Class II, at Gloucester.

The District Manager, Mr. O. G. Lee, presided, and on behalf of the Staff congratulated Mr. Barker on his well-earned promotion. Mr. Barker was asked to accept a canteen of cutlery as a tangible expression of the esteem with which he was held. Mr. A. L. May, Traffic Superintendent, supported the District Manager and wished Mr. Barker success in his new district. Messrs. C. S. Weston, Staff Clerk and J. W. Stelling, Traffic Superintendent, Class II, also spoke and extended their congratulations and good wishes. Mr. Barker feelingly responded, and thanked the District Manager and Staff for their kind wishes and useful gift which, he said, would always revive cherished memories of his happy associations in Southampton.

Mr. Barker was a very popular and genuine colleague. His transfer to Gloucester separates his associates in the offices of the District Manager, Sectional Engineer and Head Postmasters from a sincere friend.

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NEW TRANSOCEANIC RADIO SYSTEM BETWEEN EUROPE AND SOUTH AMERICA.

A PARAGRAPH recently appeared in the daily press commenting on the opening from Sevilla by General Primo de Rivera of the new Spanish—Argentine radio link. This new service, which will connect the Spanish telephone system through the International Telephone and Telegraph Corporation's network in Sevilla to the Argentine, Uruguay, and Chili, marks a great advance on anything before used in radio telephony, in that complete privacy is obtained. Overhearing by unauthorised listeners is no longer possible as the waves are transmitted in a distorted form that is unintelligible to the ordinary radio receiving station. Except for the one working between Great Britain and the United States, this radio telephone link of 9,600 Ems. (the longest of its type yet in existence) is the only one that is connected with the ordinary public telephone systems at both ends, permitting distant subscribers to converse from their ordinary telephones without either of them having to go to a central station cabin.

It is interesting to note that the subfluvial cable under the River Plata connecting the Argentine and Uruguayan telephone systems, and the transmitting and receiving stations for this new link, were supplied by Standard Telephones & Cables Ltd., and manufactured in their factories at Woolwich and Hendon.

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A BRIEF CHRONOLOGY FOR STUDENTS OF TELEGRAPHS, TELEPHONES AND POSTS.

BY HARRY G. SELLARS.

(*Continued from page* 20.)

1886, Dec. 15 ... Equitable Telephone Association, incorporated to exploit Swinton Patent Electric Telephones.

United Kingdom Postal Clerks' Association formed.

Number of telegrams dealt with annually reached 50,000,000.

Number of parcels rose to 33,000,000, of which 394,000 passed between the United Kingdom and places abroad.

1887, March ... Dr. Cornelius Herz tried the micro-telephone between Paris and Brussels successfully. Hughes' Microphone was adapted by Herz.

Campbell Swinton designed a telephone switchboard.

Oliver Heaviside showed that, by the addition of inductance to a telephone line possessing harmful capacity, speaking would be improved.

1887, May ... British Admiralty promised to arrange for a gradual survey of the Pacific Ocean in connexion with the suggested Pacific Cable.

1887, June 1 ... Horse-drawn coaches for parcels began to run between London and Brighton, and on other roads where the cost was less than that incurred on the railways.

Gustave Roberts Kirchhoff died.

Colonial Conference discussed Canada-Australia Cable.

Bernardo, of Russia, introduced a method of welding metal plates electrically.

Bristol-Gloucester trunk telephone line opened.

Carpentier, of Paris, devised a telegraph keyboard tape perforator which punched, with square holes, the five-unit code.

Cassagnes inserted a resistance in the battery circuit of the phonic wheel system.

Elihu Thomson found that a sheet of copper held over an alternating current electromagnet was repelled.

Eichberg, Winter and Latour invented commutator alternating current motors.

Righi showed that a Holtz electrical machine could yield continuous current.

1887, Oct. 1 ... Sample Post established—rate 1*d.* for 4 oz.

Sir Oliver Lodge produced stationary electric waves on long wires. H. R. Hertz invented a method of generating electro-magnetic waves.

Bose, Fleming, Lebedew, and Righi devised apparatus for producing electric waves only a few inches in length.

1887, Nov. 10 .. Hertz introduced his "Resonator" to pick up electric waves and discovered the necessity for the receiver to be "in tune" with the vibration rate of the waves set up by the transmitter.

Prof. Chunder Bose, of Calcutta, exploded powder and rang a bell by a local current brought into play by wireless electric waves.

Colonel Gouraud exhibited Edison's new phonograph in which sounds were recorded on wax, the machine being driven by electric motor.

Checking of insured parcels discontinued. Insurance fee of 1*d.* on registered letters abolished and registration fee of 2*d.* admitted liability up to £5. Insurance fee of 2*d.* still required for compensation up to £10.

1888, Feb. ... Associated Chambers of Commerce passed a resolution in favour of Government control of telephone communication.

1888, March ... Inter-colonial Postal Conference met at Sydney, N.S.W., and offered to pay the cost of surveying for the Pacific Cable.

Great Britain hoisted her flag on Fanning Island.

Dom and Munier devised methods of multiplexing the Hughes printing telegraph.

(John B. Chapman, of England, duplexed, and Banzati, of Italy, quadruplexed, the Hughes printing telegraph.

Olsen suggested a duplexed quadruple Hughes circuit in which a distributor connected the transmitters alternately to line. Banzati supported the suggestion and during the European War the method was adopted in Austria, Hungary, &c.)

Dom, of France, proposed a correction of telegraph distributors by means of the working signals.

(G. R. Benjamin and G. M. Yorke devised a bipolar method of phase correction on multiplex telegraph distributors.

Halter, of the Western Electric Company, invented a method of speed correction for telegraph distributors.

Rothermel invented the epicyclic mechanism used in American multiplex systems.)

Graphophone produced by Prof. G. Bell, Dr. C. Bell and Mr. C. S. Tainter.

Schallenberger, of Pittsburg, devised a meter for use with alternating currents.

Professor Forbes introduced a meter for measuring either continuous or alternating currents.

1888, May ... Maximum compensation for uninsured parcels of 12*s.* and 20*s.* where the limited weights were 7 lb. and 11 lb. respectively, which had been in force with foreign administrations, extended to certain colonies.

From 1871 until this date the business of issuing and paying Money Orders at the Chief Office was performed under contract, the contractor being an officer of the Post Office, but the clerks being his own servants.

"Raikes" revision of pay, &c., took place in the Post Office.

1888, Sept. ... Electric dog-cart made for the Sultan of Turkey.

Photo-electric cells constructed.

Cable rate London-New York fixed at 1*s.* a word.

Dr. Hertz and Herr von Bezold confirmed the theories of Riess and Henry concerning the discharge of a Leyden jar.

Hertz showed that electric undulations, like light-waves, are propagated across space, that they could be reflected like those of light and sound, and concentrated into a beam.

Hertz and Lodge proved that the vibration rate of ultra-violet rays assisted electric waves.

Law and Jarvis Patten introduced methods of driving the reed in a phonic wheel system by current impulses from the distant station.

Suez Canal route adopted for Indian Mail.

1888, Nov. 24 ... Western Electric upright multiple telephone switchboard installed in London.

1889, Mar. 12 ... Almon B. Strowger, of Kansas City, patented an automatic telephone system. Five wires were necessary between each subscriber and the Exchange.

French Minister of Posts and Telegraphs suggested telephonic communication between London and Paris. (Longest telephone lines then existing were New York-Chicago, 900 miles, and Paris-Marseilles, 600 miles.) London-Paris telegraph lines were tried, but were found unsuitable.

1889, April 30 ... The United, the National, and the Lancashire and Cheshire Telephone Companies amalgamated under the title "National Telephone Company" and proceeded to buy up smaller concerns.

"New Telephone Company" wound up, as a result of action taken against them for infringing Edison's patents.

Girl telephone operators now replaced generally boys previously employed.

1889, May 31 ... Post Office obtained decision that the Postmaster-General was entitled to tender post letter bags to vessels owned or chartered by certain large companies, and to have them conveyed and delivered without delay.

W. F. Melhuish experimented in Wireless telegraphy in India.

Sir Oliver Lodge invented a wireless "coherer."

(*To be continued.*)

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THE

Telegraph and Telephone Journal.

VOL. XVI. DECEMBER, 1929. No. 177.

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All correspondence relating to advertisements should be addressed to MESSRS. SELLS, LTD., 168, *Fleet Street, London, E.C.4.*

TELEGRAPH AND TELEPHONE MEN AND WOMEN.

LXXI.

MR. H. G. G. WELCH.

MR. WELCH was educated at Merchant Taylors' and St. John's College, Oxford, and entered the Post Office service in 1913. He served most of his early years in the Mails Branch of the Secretary's Office, and acted as Private Secretary to Mr. Hartshorn during the Labour Government of 1924. He was promoted Principal in 1925, and shortly afterwards was sent to the Overseas Telegraph Branch, where he has remained ever since.

Thoroughness and neatness are the outstanding characteristics of his work. Neatness with him is not merely an external attribute, but the manifestation of an essentially orderly mind, which can seize a bewildering medley of facts and figures and sort them into compartments. A memorandum by him is a pleasure to read; he first of all deploys his forces, the A, and B, and C,

[*Photograph by Howard M. King, Croydon.*

with (i), (ii) and (iii) supporting each, and then leads them together to a well-nigh irresistible conclusion.

As external characteristics of his qualities we may mention that he writes a copperplate hand, he draws up graphs in inks of many colours, he has a wonderful system of filing and records, and can usually say where even the most elusive papers are to be found.

It is difficult to write of his kindliness, his loyalty and the singular charm of his personality. It suffices to say that in an office where gossip abounds, of which not all is kindly, he has never been known to say an ill word of anyone, nor has anyone been known to say an ill word of him.

The telegraph service provides, and will probably continue for a long time to provide, plenty of knots for him to unravel and labyrinths for him to unthread; and gives ample scope for his gifts of sympathy, courtesy and good fellowship.

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THE TELEPRINTER.

A. P. OGILVIE (*Headquarters Traffic Section*).

(I.)

REFERENCES to the Teleprinter, in articles dealing with proposals for the improvement of the telegraph service, have appeared from time to time in these columns, and their frequency is indicative of a growing interest in the development of this type of apparatus. During the past few years considerable progress has been made in the British Post Office in the testing and installation of different models of Teleprinters, and in standardising training, operating, and maintenance arrangements. The results are now becoming apparent, generally, and it is no exaggeration to say that the Teleprinter is capturing the imagination of telegraph men as few other systems or machines have done. Its reception at first was, perhaps, somewhat cool, but telegraph men may claim to be justified in adopting a critical attitude towards innovations, for there is no business more exacting than telegraphy, and it is a common experience with many systems and devices which survive technical tests to fail on reaching the supreme test which working conditions impose. Besides a British telegraph service without morse was inconceivable, and here was a machine attempting the impossible in invading the stronghold of the sounder.

The newcomer, however, withstood early vicissitudes, surmounted difficulties, and finally made friends. There is now a widespread demand for this class of machine throughout the world. In this country, installations are being completed on public and private circuits as rapidly as apparatus can be obtained; in the United States, thousands of sets are being absorbed by American telegraph companies annually; while in the Dominions and in France, Germany, Holland, and Denmark, considerable similar activity is in evidence. New conditions are being created and new hopes for the future are being stimulated.

Interest in the Teleprinter is therefore spreading beyond the confines of the telegraph room, and has given rise to requests for information, not in technical details alone, but of a more general nature which an extensive, rather than an intensive view of the subject would afford. To meet this demand it is proposed to deal discursively, in a short series of articles, with the principal features of Teleprinters, their capabilities and limitations, the variety of conditions in which they have been tried and the results obtained, in the hope that the matter may prove interesting if not informative, to the general reader.

To those who wish to explore the technical intricacies of the apparatus and to study the subject in its purely technical aspect, the proprietary instruction booklets published by respective manufacturers are recommended. These may be obtained from Messrs. Creed & Co., Croydon, for the Creed Teleprinter; from the Morkrum-Kleinschmidt Corporation, Ltd., Chicago, for the Teletype; and from Messrs. Siemens & Halske, Berlin, for the Siemens Halske Telegraph Printing or Writing Machine.

Perhaps more suitable for the Post Office student is a series of excellent articles entitled "Start-Stop Printing Telegraph Systems," by Mr. A. E. Stone, A.R.S., Sc., which appeared in the *Post Office Electrical Engineers' Journal* in 1928-1929.

The first Teleprinters to be tried in this country were produced by the Morkrum Corporation under the proprietary name of "The Teletype." In 1914 a promising design had been outlined by Mr. H. H. Harrison, the well-known British telegraph engineer, whose book on the principles of machine telegraphs is accepted as authoritative, but unfortunately subsequent war conditions prevented the apparatus from being placed in production. It was therefore due in a great measure to the work of the Morkrum Corporation that rapid progress in this direction was possible in the early post-war period. Teletypes were installed in fairly large numbers by the British Post Office in 1923 and 1924. Messrs. Creed about this time also entered the field with a British machine. Trials over an extended period took place and as a result of continuous improvements in design the operation of the Teleprinter No. 3a reached a high standard of efficiency. There are at present three models of Teleprinters in use, and to avoid confusion with proprietary names the Post Office decided to adopt the generic term of "Teleprinter" and to number the models as follows:—

Teleprinter No. 1a (formerly Teletype No. 1).
,, No. 2a (,, ,, No. 2).
,, No. 3a (,, Creed Combined Printer).

Messrs. Creed followed Post Office practice and now use "Teleprinter" as a trade description for machines of this class.

When originally introduced the Teleprinter No. 1a was so arranged that only one message could be signalled at a time in either direction, the characters transmitted being recorded on a local tape as well as at the distant station. Two machines, or one complete machine and a separate printer unit had to be provided at each office for duplex operation, i.e. the signalling of telegrams simultaneously in both directions, an arrangement which considerations of space and cost rendered unacceptable although it was understood to be standard American practice. It was found ultimately that by a simple alteration in the connexions, the transmitter and printer could be operated separately, at the expense of the local record which was not required, and one machine was made to provide for simultaneous transmission and reception under duplex conditions. This stage represented a definite advance in development as the traffic carrying capacity of each machine is, by this alteration, practically doubled with completely satisfactory results.

Another advantage determined during those early trials led to the working of Teleprinters over long circuits. The term "short line printer" had been accepted as a measure of their limitations, so much so that the circuit on which the machines were first installed between the Central Telegraph Office and Croydon did not exceed 15 miles in length. Experience on that circuit encouraged a belief in greater things, and a trial took place between the Central Office and Carlisle, a distance of approximately 300 miles, on a circuit consisting of one wire of a cable loop, the second conductor acting as a screen. The results obtained exploded the short line fallacy and again impetus was imparted to development. Concurrently, improved acquaintance with the keyboard made operators confident and efficient. Hourly outputs of 70, 80, and 90 telegrams in one direction or the other were being obtained on the trial circuits; the indications were becoming pronouncedly favourable for further progress.

Since 1923 approximately 400 Teleprinters with appropriate reserve machines, have been installed on public circuits, 50 have been used in equipping private wires and 60 are employed on Totalisator arrangements and at special events, a creditable record which but for delivery and other difficulties would have been even better.

Without assuming the mantle of a prophet it can be said that the day of the morse sounder as the pre-eminent system is passing; and there is ample evidence that with the improved methods of superposition now becoming available the extension of Teleprinter working on routes hitherto equipped with multiplex is a practical proposition.

In a later article it may be possible to expand this phase of development. Next month it is proposed to devote some time to a brief description of the machines themselves, their principle of operation and their outstanding mechanical features.

(To be continued.)

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RISK.

BY F. J. LANE.

(*Contract Officer, Class II, Reading.*)

THE world of men may be roughly divided into two classes :—Those who are honest and those who are not. The existence of the latter class, the individuals of which cannot be at once identified, brings the element of risk into all commercial transactions ; it is the large preponderance of the former section which permits industry to operate and makes the taking of risk worth while.

Critics of the Post Office Telephone Service frequently base their arguments on the proposition that the Civil Service operated system cannot, and does not, take any risk. This bald statement is manifestly absurd, since immediately the Post Office embarks on an undertaking where the allowance of credit is unavoidable, it becomes involved in the risk inseparable from such a proceeding. But since no one desires to expend energy and wealth for no return, commercial risks are not taken for the joy of the thing. Effort is made by all concerns whether privately, or publicly, operated to insure against risk. The danger here, is the tendency to pay an uneconomical premium to insure the capital, and the peculiar position of a Government Department, with its public responsibility, makes the exact determination of an economical premium very difficult. The writer hastens to say that he has not the slightest intention of of attempting this intricate calculation ; but merely to make some observations by the way on small everyday transactions which seem sometimes to become a little warped out of shape through excessive caution. Pardon is craved if it appears that the advice printed on the box of a much advertised ointment is followed too zealously—ascribe it to enthusiasm, or, if preferred, to bad temper.

The 3-inch magneto extension bell is a small thing in size, in intrinsic and rental value ; but in spite of the fact that, as the writer hinted in a previous paper on Recovering the Waste, its value in operation to the Department is almost equal to that to the subscriber, the way of its renter cannot be said to be smooth. The subscriber must take it on the same terms almost and in the same manner as a sizeable private branch exchange. He must sign an agreement bearing at the top his full name and at the bottom his (not his deputy's) signature duly witnessed.

Should the bell outlive its usefulness in the course of structural alterations the hirer must embark on the heavy ceremony of giving three months' notice (from a quarter day) to say " Goodbye " to his erstwhile friend.

If this is not enough let him desire to move this system to which the bell is attached to another site. Then no one asks him to pay the standard charge of 5*s*. for the work ; on the contrary, he may avoid doing so by the " simple " trick of giving three months' notice (from a quarter day) to cease the bell and then signing a fresh agreement for it bearing at the top.....

And why should all this be ? It is simply because—by a quite natural process, mark you—the unfortunate little bell has been caught up in the procedure appertaining to major transactions where the strong element of risk has to be guarded against. Thus involved the importance of the bell swells to grotesque proportions—a fantastic premium is paid for a minute risk.

Supposing the bell is torn from this tangle and treated thus :—A request is received for it and an acknowledgment is sent informing the subscriber that the desired bell will be fitted as soon as possible and that a quarterly rental of 1*s*. 6*d*. will be charged for it. If, eventually, it is no longer required—then recover it. If it must be moved—then move it. A deal of administrative trouble is saved. And what is wrong with it ?

There is perhaps the hundredth chance that the subscriber will not pay—then go to recover the bell and the subscriber reviewing the semi-paralysed condition of his telephone service before the bell's advent will at once pay up. There is possibly the millionth chance of the subscriber who still holds out and the bell goes : then the Department loses—a tiny portion of what it has been gaining in saving of paper time and temper (of the subscriber and others) and administrative expenses generally. In point of fact, it will probably be found that this millionth subscriber is being eagerly (and unsuccessfully) sought for the whole of his telephone account to say nothing of his gas bill and rates.

The case of the bell has been dealt on so much because it always seems to present the best (that is the most fantastic) examples but it is not altogether isolated.

Removals, one might observe, are not always as straightforward as they might be. A special form is usually insisted upon and one feature of this form, which sometimes operates to the mutual disadvantage of the Department and the subscriber, is the requirement that it must bear the same signature as the principal agreement. There is something to be said for this : but there are times when a trivial removal is required by an important departmental manager who has full authority for expenditure in his branch. Unfortunately, however, it is usually found that the agreement bears the secretary's signature and then we begin to look ridiculous, and only very slightly less so if we permit the manager to sign at same time, stating his authority to do so.

The obvious cure for this is more elasticity of mind. Generally if there is no good reason to doubt the validity of a request for a removal, then proceed with it. In the case stated above there is no risk at all and the awkward method is simply the malign influence of the " caution complex." It is this habit (when it becomes a *bad* habit) that is at the bottom of the trouble. How it develops is illustrated by the following example : A letter was received from a reliable and well-known firm requesting and exactly describing a small removal. It was signed by a director and was remarkable indeed for its final paragraph which read :—" We hereby undertake to pay all charges in connexion with the work." This letter was forwarded to an outstationed Contract Officer with instructions for him to obtain the necessary (!) removal order.

There is no objection to the general use of the form—the Department's forms, the Press might observe, frequently serve the purpose of a tediously composed letter, but the insistence on it for nothing but its own sake shows how far the working of the mind can be divorced from ultimate objects. It is the development of this state of mind which is a real danger, adding very appreciably to administrative costs, slowing down real work and bringing the service into disrepute. Though its roots go far down in the laudable desire to minimise risk, it reaches far beyond and away from its purpose. In fact the original purpose is partly neutralised by the fact that a sense of security is engendered by the adherence to certain formalities which some flexibility and agility of mind would show to be a false one. A thought is cultivated that provided everything is *formally* in order the bird is in the hand ; whereas anyone who has attended the proceedings of a County Court knows that it is still in the bush.

Another curious effect observed is that whilst transactions of almost any magnitude are speedily concluded over the telephone daily, the telephone administration itself will have none (or very little) of it. Subscribers making trivial requests are frequently asked to put them in writing, or, at the best, laboriously (and expensively) connected to more exalted officers apparently because some half-witted cantankerous old gentlemen may deny having made the request.

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One would not grumble if the system were an infallible one but that system is but a will o' the wisp, the pursuit of which does incalculable harm. It is better to recognise frankly that all risk cannot be eliminated and cheerfully go on with the work of doing the greatest good for the greatest number.

It might be objected that if instructions regarding certain removals, extension bells and other small transactions are to be taken in the same manner as say, the Gas Companies take minor orders, there would be no logical reason why the method should not be extended to every transaction with probably disastrous results. This criticism pre-supposes the conduct of the service by an army of automata in place of an intelligence capable of distinguishing between slackness and elasticity. Uniformity can be an *intelligent* uniformity without being just mechanical sameness. System can be a fine ideal aimed at by flexible rational minds without being a god before which all men bow at exactly the same angle and abandon themselves with oriental resignation.

[We comment on this article in an Editorial.—ED., *T. & T. J.*]

TELEGRAPHIC MEMORABILIA.

THE kindest thoughts to all for Christmas and 1930. I have been almost at my wits' end to know,—not, gentle reader, where to find sufficient matter but what, out of a basketful of interesting subjects, to consign to an undeserved limbo.

The following three items have been considerably condensed, but those which follow are quite skeletonised, and, it is hoped, will nevertheless fulfil their informative purpose.

There is the Royal Commission report on broadcasting in Canada which recommends that, "broadcasting should be placed on the basis of a public service and that stations providing a broadcasting service should be owned and operated by one national company."

It also recommends as a minimum plan to commence with, the erection of high-power stations across Canada as but the nucleus of a publicly-owned service. There is naturally quite a number of details, ways and means, &c., of a deeply interesting nature.

Turning to another portion of the Empire, the position of the Australian Broadcasting Company which is supplying programmes for the national broadcasting service of the Commonwealth Government, is a curious one. The company, it is stated, is losing between £10,000 and £15,000 per annum in its endeavour to give a better service to the listening public, and reveals another side to broadcasting, that is to say under certain geographical conditions where the areas covered are very large and comparatively sparsely populated by potential clients. It is hoped, however, that during the next four or five years sufficient headway will have been made to compensate the A.B.C., as it is commonly referred to down under.

Another Australian complication is apparently that of the Amalgamated Wireless (Australasia) Ltd., which, says the London *Daily Telegraph*, after an interval of twenty-one months has only just published its balance-sheets for the last two years. These, however, show profits of £47,000 and £80,000 and dividends of 6 and 8% respectively. "The company had previously paid no dividends and made no profits," says the same authority, and continues thus: "The Commonwealth subscribed capital shown on the balance-sheet, as at June 30, is £744,000, while the Commonwealth *contribution* is £300,000, which is £73,000 below a majority holding. The Commonwealth contribution covers practically the whole cost of the beam radio-telegraph services, which is recorded in the balance-sheet as £304,000. Regarding the combined working of the cable and wireless services the Amalgamated Company is the only organisation in the Empire which has not co-operated in the amalgamation. An anomalous position thus exists by which the Amalgamated Company cannot dispatch a single word either to England or Canada without the willingness of the Communication Company to receive, and it therefore has no complete international service itself!"

A matter of world-wide interest is what it is hoped will now prove to be the settlement of the League of Nations Wireless Station question, as the final sub-committee has unanimously pronounced in favour of the proposal that the League's wireless station shall be worked in normal times by the Swiss Wireless Company and handed over to the League in times of crisis, when a Swiss observer would be present. The Swiss Wireless Company would undertake to establish alongside the existing station at Pragins, near Geneva, short-wave transmitters for extra-European communications.

CANADA reports that in response to letters and petitions in Eastern Canada the Northern Electric Company's broadcasting station (C HYC) has resumed broadcasting on 775 kc. It is satisfactory to hear as we go to press that the broadcast by the B.B.C. of the Cenotaph service on the 11th ult. was well and truly carried out by all concerned, both here and in Canada. The wavelength employed on the trans-atlantic multiplex beam link was 16.575 metres. COLOMBIA has authorised the I.T. and T. Corporation to construct a radio station at Bogota and two additional coast stations, one on the Atlantic and one on the Pacific. FIJI ISLANDS have made a new link in Empire communications by the opening of a high-speed wireless telegraph service between Suva, Fiji, and Sydney, N.S.W. By arrangement between the Colonial Office and the Government of Fiji, says *The Electrical Review*, Amalgamated Wireless (Australasia) Ltd., in which the Commonwealth Government has a controlling interest, has reorganised the wireless service in the islands. The Company, says *The Times*, has now established three large centres in the South-West Pacific, at Fiji, New Guinea, and Papua. The Fiji station is in direct touch with three other stations in the Fiji group, viz., Labasa, Savu Savu, and Taviuni, and maintains communication with Samoa, the Friendly Islands, Gilbert and Ellice Islands, New Caledonia, and the New Hebrides. The Suva station collects and distributes traffic from all wireless equipped stations in the North and South Pacific, while its daily broadcast reports have proved of great value to shipping in the neighbourhood. HOLLAND has been much troubled of late by radio interference not only from electrically worked railways but from illuminated advertisements and sky-signs. ICELAND is soon to have its first broadcasting station—at Rekyvik. Marconi interests are to build a new wireless station of 16 kw. and arrangements are to be made for facilities for broadcasting in addition to the wider telegraph uses. PORTUGAL now has direct wireless telegraph communication between Macao and Lourenço Marques. SPAIN's direct radio communication with the U.S.A., Brazil, Argentina, and Cuba was inaugurated on Oct. 21 by the King of Spain.

Sundry Matters.—As a piece of helpful information, especially as enquiries concerning the existence of a similar work have from time to time been received here, it is not inappropriate to mention that Sir Isaac Pitman & Sons, Ltd., London, have just published a "Technical Dictionary of Engineering and Industrial Science," in seven languages, at the net price of £8 8*s*. the set.

The National Telewriter Co., Ltd., according to the financial editor of the *Electrician*, will be granted a new licence by the P.M.G. for the use of telewriters on Post Office private wires, "on satisfactory terms for 14 years from April 30 last." When this slow and simple telegraph system was installed, some time prior to the war, few of us thought it would have survived these years of keyboard transmitters and direct typewriter telegraph circuit, but though its use is restricted, it has evidently found a niche in the commercial world where speed is not a first consideration. As a strange set-off to this survival, there is the recorded case of the Siemens high-speed apparatus with its typewriter keyboard perforators, well known as a rapid and reliable telegraph system. During the last Olympic Games held at Amsterdam the Dutch Telegraph Administration agreed to work eight Siemens

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perforators and to accept perforated slip from the German press representatives at the price of 1 franc 50 per metre for certain offices in Germany. Throughout the whole of the period covered by the games, only *one* such band was handed in at the Stadium, and that was so badly perforated (by the pressman) that the transmission took 1½ hours to complete it.

It was very gratifying to read the *Daily Telegraph* critic's verdict on the C.O.D.O.C.'s performance of "Veronique," at the King's Hall, Covent Garden. Mr. Arthur Brough and his orchestra should feel particularly proud of the "more than usually efficient orchestra."

Personal.—It is a long time since we Londoners have met Mr. T. Herbert, M.I.E.E., Asst. Superintending Engineer of the South Lancs. district P.O. Engineering Department, and the author of certain standard works on Telegraphy and Telephony, so that when one met his photograph in a current number of the *Electrician*, one could only remark upon his well-preserved appearance! He was recently elected Chairman of the N.-West Centre of the Institution of Electrical Engineers, and gave a very interesting address at the opening of the present session on "The Inland Telegraphs: A Forecast of Some Possible Developments."

On Nov. 7 the Mayor of Hastings unveiled a tablet in honour of Mr. John L. Baird on the building where, in 1923, he began three years' experiments in connexion with television.

For the Research Department?—A woman applicant at a London Police Court recently complained of her neighbour's aerial, on the ground that, "it was the wrong wavelength, upset her washing, and made it as black as soot!"

Women as Mechanics.—It is wrong to say that a woman cannot adapt herself to a mechanical career, nor is it correct to say that she has no inventive turn of mind.—*Miss C. Haslett.*

J. J. T.

NEW ZEALAND TELEPHONES.

AMONGST other interesting statistics given in the report of the New Zealand Post and Telegraph Dept. for 1928-9 are the figures showing the proportion of dial and manual telephones in the Dominion. They are 42 to 58% of which latter figure 5 are common battery. The number of extension stations to main stations is also shown. There are 53 extensions to every 100 business stations, and 3 extensions to every 100 residence stations. The actual totals for the Dominion are 124,831 main and 23,105 extensions or 147,936 telephones in all, an increase of 5.9 on last year.

The carrier current system is to be introduced on the New Zealand trunk lines, contracts for 5 carrier current telephone systems having been let last July for channels between Auckland—Hamilton; Christchurch—Seddon; and Hamilton—Palmerston North.

The report gives the following succinct account of the advantages of this system:—

"Application of the new system constitutes perhaps the most remarkable change and progressive move that has taken place in telephone practice for many years. To the layman the working of the system is something akin to sending a message along a wire which is already being used for messages without interfering with such released, but instead of being home circuit. Under carrier carrying at the one and each frequency versation. The simultaneously. the use of the circuit may be

tion of carrier current enables several persons to hold conversations over the one circuit at the one time. Not only is the carrying-capacity of the circuit increased, but the volume of speech over long distances is considerably improved. Thus, in addition to enabling the Department to defer for many years the erection of additional toll circuits, the advent of carrier current gives to the public the direct benefit of greater ease in making long-distance communications. In the near future carrier current will enable a person in Auckland to converse with a person in Dunedin at any hour of the day or night with the same facility as if he were in the same city."

MRS. NORMAN, Grass Dale, St. Lawrence, Jersey, is in her 82nd year, and is the caretaker operator of the St. Lawrence Exchange, Jersey, which has 60 subscribers.

In addition to attending during the whole 24 hours to her exchange, she has a small farm, chickens, vinery with greenhouse 60 ft. long, and large greenhouse with hot-house plants, and attends to her large garden.

Mr. Stanhope (the Engineer-Manager of the Jersey system) assures us that she is a very capable operator and that her ready French and English speech to subscribers is really astonishing.

TELEPHONIC ATTACHMENTS.

THE description of a new dance hall and restaurant in Berlin, with a telephone on every table and also "a pneumatic postal plant" for the immediate delivery of letters to other diners or dancers, suggests a certain flightiness on the part of a race that used to be regarded as phlegmatic. It is true, of course, that "night life" in the German capital is now understood to be more highly organised and prolonged than in any other European city, but one would have thought that it was possible to go out for an evening remain satisfied with the at your own table. These facilities for getting musing parties are ominous; est that fidelity for even five minutes.

way, of course, turn to the older idea of a artner for ev ul applicants of those days, heir progra walk round and tender their ts in perso still and book a telephone call!—brief no *Manchester Guardian.*

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THE NEW PRESIDENT OF THE INSTITUTION OF ELECTRICAL ENGINEERS.

ONCE more has the honour of the presidency of the Institution of Electrical Engineers been conferred upon an official of the Post Office, Colonel Sir Thomas F. Purves, O.B.E., M.I.E.E., the present Engineer-in-Chief of that particular State department. The simplest and the truest thing to say in these circumstances is that the Post Office is itself honored by this unanimous vote of the Institution.

Colonel Sir Thomas delivered his presidential address at the headquarters of the Institution in London, but thanks to the efficiency and co-operation of the British trunk telephone service, the occasion was utilised as a demonstration of a telephone service known as "Conference communication," for, not only was the president clearly heard in two halls of the Embankment building, but the I.E.E. local centres at Manchester, Liverpool, Birmingham, Glasgow, Leeds, Newcastle, Cardiff, Southampton, and Portsmouth, were all within easy range of the speaker's voice, the speakers at these various centres all taking part in the discussions. In fact at the conclusion of the address Mr. Harcourt Wilson *at* Manchester proposed, and Dr. Magnus Maclean *at* Glasgow seconded, the cordial vote of thanks which was instantly and unanimously passed to Col. Purves by London and the nine centres mentioned above.

The opening phrases of the address were arresting. "Whilst the dissemination of power, light, and heat by electrical means is an achievement in the service of humanity," said the new president, "the Communication Engineer is inspired by the reflection that his *métier*, the transmission of thought, intelligence, and information is a no less worthy contribution to the status and to the legitimate pride of the electrical engineer." Then came the startling truth in a few words which much less than a decade ago would have startled the whole globe. "To-day 90% of the telephone stations of the entire world can be spoken to from London."

Our E.-in-C. anticipates that in seven years' time the number of automatic exchanges in the Central London business area will have reached one hundred, leaving only five manual exchanges for conversion, and that :—50,000 lines will be added annually to the London automatic system until the conversion of that area.

When one realises that the greater portion of the president's listeners were business men interested and engaged in the Electrical Engineering industry, though in other directions, the clear and concise manner in which the question of *Telephone Development* was dealt with could not but have deeply interested his listeners. Emphasising the point that the cost of elaborate and careful development study is richly repaid to an administration such as the Post Office, which is actually sinking about £10,000,000 per annum in the provision of additional plant to meet growing requirements, the speaker at once admitted that "the number of telephones *in use* in Great Britain is far smaller than it should be," but quietly added, "unfortunately, the same remark applies to the amount *of use* made of the service." Obviously, if the total traffic originating at 300-lines exchanges and higher only amounts to an average of 5.3 calls per line per day, "it would indeed be putting the cart before the horse to pour more capital into the system."

The presidential references to "the study of the ideal wave-transmission line, and to the efforts made to realise its qualities in practice, and the striking progress made towards world-wide range," were specially interesting and were not unnecessarily couched in ultra-scientific terms. On "loading-coils, one would rejoice," he said, "to find it possible to supersede inductive loading by some less formidable means of reducing attenuation and the various forms of distortion which appear in unloaded underground cables. Methods by which this may eventually be accomplished, by compensating devices at the ends of the cables, are, however, appearing and coming into use."

The matter is admittedly one of extreme complication, sometimes, as is well known, the "remedy" produces another "disease," so that "the answer to the frequent question whether amplifying and distortion-correcting devices have sounded the death-knell of inductive loading is therefore decidedly in the negative, while it is clear that the art of cable manufacture will need to achieve another order of freedom from cross-talk before an answer in the opposite sense can be given. This is not intended to imply that telephone-cable design and manufacture are in any sense open to the charge of being non-progressive," concluded the speaker when dealing with this particular point.

Sir Thomas paid due tribute to the presidential address of Mr. Frank Gill (at present in Japan), in 1922—which no doubt many readers will recall—and which address created a marked and lasting impression on the continent of Europe and no doubt resulted in the foundation and success of the C.C.I.

Speaking of the transatlantic and other long-distance telephone radio services and the question of privacy, the president guardedly said that he did not wish to suggest that secrecy in radio-telephony is yet in sight, in the sense that a competent outsider who is prepared to spend money in making arrangements to overhear conversations would never be successful, but he had little doubt that the system will ere long be equipped in such a way that a sustained and very elaborate attempt would be necessary in order to do so.

Reference to telephone repeaters and the possibility in the near future of Imperial Telephony by means of short waves led to "Maximum distance conversations and power used," and to an illustration of the fact, now well known, that the dimensions of the earth do not now set bounds to the range of telephony. Col. Purves related how two P.O. members of the engineering staff spoke from Stockholm to an official of the American T. and T. Co. in New Jersey by the following linked-up route :—Stockholm via Berlin and Amsterdam to London, thence to New York by radio, then stage by stage via Chicago to San Francisco, to Los Angeles, and back by another channel to New York, with a final extension to New Jersey, a total distance of 14,000 miles, and an aggregate length of copper conductor of 40,000 miles.

It is permissible, said the president, to think of the power which would be required to deliver currents of telephonic magnitude at the *far end* of such a circuit *in the absence of* repeaters. We start with an acoustic energy equal to about 10 microwatts delivered into the telephone transmitter by the voice of the speaker. Now to deliver even *one* microwatt at the far end of such a circuit *without* intermediate amplification, the initial energy must have the inconceivable value of $10^{2^{31}}$ kilowatts. . . ." Making a brief calculation and accepting the estimate of a professor regarding the possible number of suns within the "world-line,"—then it comes about that "the whole *radiant* energy of nature would fall immensely short of meeting requirements, and," added the Colonel, with a twinkle in his eye, "it seems evident that the invention of the telephone repeater has tended to simplify certain problems!"

J. J. T.

[*With due acknowledgments to "The Electrician" and "Electrical Review" for their assistance.*]

A ST. ALBANS NOTE.

AN incident is reported from Radlett, Herts, displaying the promptitude of the local caretaker-operator. A man called at Dr. Wilson's house after he had gone out for the afternoon one Sunday, and finding the maid alone in the house, forced his way into the hall. He attempted to gag the maid, who pluckily resisted him and managed to knock the telephone receiver off the hook and scream loudly enough to attract the attention of the exchange before she was gagged. The Radlett operator, hearing the screams, had the good sense to notify Dr. Wilson's partner and also the police, who both went at once to the girl's assistance—not, however, unfortunately, in time to capture the thief.

The caretaker-operator has been commended for his alertness.

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THE TRANSATLANTIC TELEPHONE.

BY HENRY T. RUSSELL, *United Press Staff Correspondent.*

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"Hello, New York!" calls a feminine voice with an afternoon-tea sort of pronunciation, in London. An instant later a typical New York "Hello, girl," with the familiar and sometimes nasal accent, replies from across the Atlantic: "Yes! London!"

These two brief remarks are the prelude to a transatlantic telephone conversation. They are all the talking that is required to set in motion the machinery which enables any one of 25 million telephone subscribers in many parts of the world to speak to a friend thousands of miles away by the mere lifting of a telephone receiver.

To-day, scarcely more than half a century after Alexander Graham Bell made the telephone a commercially practical proposition, telephone users in Paris, Berlin, Rome and Madrid can call New York, Chicago or San Francisco, as easily as though they were trying to communicate with a secretary in a next-door room. So can Holland, Belgium, Switzerland, Austria, Hungary, Norway, Sweden and Denmark talk with transatlantic friends often with no more trouble than the actual lifting of a finger.

Perhaps one of the most fascinating aspects of this development of human inter-communication comes from the fact that all these calls have to go through a single organisation known as the London Telephone Service. Indeed, Europe's calls for the United States, Canada, Mexico and Cuba, and *vice versa*, are centralised in London, thus modernising into "all wires lead to London" the ancient saying that "all roads lead to Rome."

Standing at the cross-roads of the world's telephone system, through the courtesy of the Superintendent of the American Service, the United Press correspondent was privileged actually to witness the manner in which some 20 million miles of telephone wires in Europe are linked with fifty odd million miles of wires in North America.

Paradoxically enough, this, the final act to what may be described as one of the greatest romances in the history of the world's scientific progress, is one of the simplest operations imaginable—or at least so it appears to laymen visitors. The "trunks" (English for long-distance) office of the London Telephone Service is so organised that officials there think no more of connecting Madrid with San Francisco, a wire, submarine cable and wireless distance of over 6,000 miles, than they would of switching a grumpy London subscriber on to a supervisor less than one mile away.

"Actually the longest connexion which we have ever put through from this office," explained the Superintendent to the United Press, "is one from Ceuta, Spanish Morocco, to Havana, Cuba, which by wire, cable and wireless is a distance of approximately 7,000 miles. It can be safely said that, assuming conditions to be normal on the wires traversing the six countries concerned" (Spanish Morocco, Spain, France, England, the United States and Cuba) "and providing the submarine channel cable and transatlantic wireless channels are functioning properly, we can put through a Ceuta to Havana call in about the same time as it would take us to connect Liverpool with Wolverhampton, England, less than 100 miles distant."

An even greater distance than from Ceuta to Havana can be covered by telephone through London, explained the official, although nobody has yet put through a call. For instance, he added, communication by telephone can be established through London from Ceuta to Mexico City. And in the not-far-distant future, he explained, it was hoped that London would be able to hold routine conversations by telephone with Sydney, Australia, 10,000 miles away. So far, however, although frequent excellent conversations had taken place between the two cities, he said, the service had not yet been opened to the public.

Visualise a large room in a telephone exchange in which from one to several hundred attractive young women wearing headphones respond to anything up to 60 demands each per hour. In one corner of this room, scarcely larger than the space in front of a soda fountain in a side-street New York drug store, sit the staff of 15 expert operators, the human link in the chain of wires by means of which human speech in many different languages is almost instantly transmitted over half-way round the world.

Suddenly a light appears on a small switchboard above a hole of no greater circumference than that of a pencil. A girl known as a "recording" operator sticks a plug into this hole and listens to a London subscriber asking for a call to New York, for instance. Particulars are quickly noted on a slip of paper. This is promptly handed over to an operator in charge of another switchboard who, simply by moving a switch with one finger, opens a circuit to New York, and with a calm "Hello, New York," asks for the number she has been instructed to get.

If, instead of originating in London, a call for the United States is put in from some point on the continent, the procedure is slightly different. A girl known as a "preparing operator," who sits right beside a colleague known as the "controlling" operator, takes the call from the continental city in whatever language she may be expected to specialise. Then, translating the particulars of the call into English, she hands them to her team mate, a mono-language girl who deals with New York only.

Although, according to the number of people who may be placed on a waiting list for transatlantic calls, a call may require anything up to two hours to put through, assuming that the lines are free and traffic is very slow, it is quite possible for a man in Madrid to get through to New York within from two to five minutes. Some idea of the formidable feat of organisation required to enable such rapidity of service can be gained by considering the route which such a call would have to travel by. In effect it is transmitted over the landlines of Spain and France. At Boulogne, on the French coast, it goes by cable beneath the English Channel. It then crosses England's landlines until it reaches the wireless terminal at Rugby, and from there it is sent across the Atlantic via the ether to the United States.

All transatlantic telephone calls are timed with a stop-watch. Girls known as "observing operators" sit at a special table and "listen-in" to all conversations for this purpose. At the same time, they make note of atmospheric disturbances, and anything that interferes with the efficient transmission of a call, scrupulously deducting from the $45 charge per three minutes of conversation even the number of seconds which they believe it would not be fair to make the subscriber pay for.

"Get me New York, please, Miss," suddenly asked the Superintendent, adding: "It will be a Service call." And so saying he beckoned to the correspondent.

"If you will take that lady's place" (he pointed to one of the operators at the observing table), "put on her headphones and listen, you shall see and hear for yourself just exactly how we put through a call from London to New York."

But before the suggestion had been carried out an impish voice called out in a tone as innocent as that of a schoolgirl excusing a prank: "You are through" (pronounce thr-r-rough, which is the English way of saying "here is your party"). "Excuse me, Sir, but New York is waiting!"

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REVIEWS.

"A.B.C. of Television, or Seeing by Radio," by Raymond Francis Yates. Published by Chapman & Hall, Ltd. viii + 210 *pp. Price* 10*s.* 6*d. net.*

This volume has been produced for the amateur who wishes to obtain a working idea of the principles upon which television is based, and of the types of apparatus by which these principles are carried out in practice, without having to study books and papers written for professional specialists in the subject.

The whole subject is dealt with in a very readable and non-technical manner, and hints are given to help anyone who wishes to take up actual experimental work in this field of applied electricity.

The text is fully illustrated with clearly drawn and well reproduced diagrams, together with many interesting photographs of apparatus. In conclusion, a chapter is given describing how the amateur can make a television receiver for himself.

This book is the best popular account of the subject with which we are acquainted.

"Telegraphy and Telephony, including Wireless Communication," by E. Mallett, D.Sc. Published by Chapman & Hall, Ltd. ix + 413 *pp. Price* 21*s. net.*

This book has been produced to fill the gap between the elementary descriptive text-books written for linemen and mechanics and the specialised treatises on the various sections of the subject which are needed by professional engineers engaged in one or other of the many branches of the art of Electro-Communication.

It assumes a knowledge of the fundamental facts of electricity and magnetism and some acquaintance with the elements of the calculus. Given this preliminary equipment the book takes the student through the whole field of the theory of present-day telegraphy and telephony.

Part I, on Line Telegraphy, treats of simple apparatus and systems, short and long lines, transients, and high-speed apparatus and systems.

The second part, on Line Telephony, commences with a mathematical chapter on alternating quantities, and then deals with speech apparatus, transmission theory, the use of valves in telephony, and the arrangements used at exchanges, both manual and automatic.

Part III, on Wireless Telegraphy and Telephony, has chapters on Electro-magnetic Waves, High Frequency Circuits, the production of Transmitting Currents, and Reception.

The book concludes with a series of appendices in which are given a very complete collection of mathematical formulae, and mathematical discussions of certain important circuit arrangements not dealt with in the text.

The book is very fully illustrated and the diagrams are exceptionally well drawn and clearly reproduced.

With the exception of the constructional side, which is not touched, the book is the finest treatise which has yet appeared dealing with telegraph and telephone engineering. It presents the student in one convenient volume with information for which he would otherwise have to seek from many different sources, with possibly doubtful success.

"Introduction to Theoretical Physics," by Arthur Haas, Ph.D. Vol. II. Second Edition, revised. Published by Constable & Co., Ltd. xi + 492 *pp. Price* 21*s. net.*

Some months ago we noticed in these columns the first volume of the revised Second Edition of Dr. Haas' "Introduction to Theoretical Physics." The second volume has now appeared, and fully comes up to the standard of the first one.

The volume under review commences with a section on Atomic Theory, in which, as far as is possible with such a rapidly developing subject, the latest advances are dealt with, including De Broglies and Schrödinger's wave theories of the electron, and the quantum mechanics of Heisenberg.

The next section deals with the theory of Heat, prefaced by a chapter on statistics as an introduction to the statistical methods used in thermodynamics.

In the final section the theory of Relativity and its consequences are discussed.

The book concludes with a summary of the ground covered in the preceding chapters, tables of the symbols most frequently used for the various quantities dealt with, and a table of the universal constants of physics.

The same clearness in discussion is evident in this as in the previous volume, and the whole work forms the best introduction to modern Physics with which we are acquainted.

"Private Automatic Branch Exchanges," by R. T. A. Dennison. Sir Isaac Pitman & Sons, Ltd. Price 12*s.* 6*d.*

This new volume will undoubtedly be welcomed by Departmental officers in particular, and will be a useful addition to technical manuals on Automatic Telephony. The author confines himself to the facilities, apparatus and circuit operations of four types of P.A.B.X. equipments in use by the Department at the present time—the reasons for standardising the particular facilities, however, are not given, but this does not materially detract from its use as a book on how the facilities are furnished.

The systems described are those of the Relay Automatic Telephone Co., the Standard Telephones & Cables, Ltd., Automatic Telephone Manufacturing Co., and Siemens Bros. & Co. By far the bulk of the book deals with the first-mentioned system, as used for small two-digit exchanges, but this is no doubt explained by the fact that by far the larger proportion of P.A.B.X.s in service in this country are of this type, whilst the step-by-step P.A.B.X. equipments of the A.T.M. Co. and Siemens Bros. are essentially similar to the public exchange systems which have already been dealt with in other text-books.

The book is not only lucidly written, but it is complete with excellently drawn and clearly made-out diagrams which should prove extremely helpful to all concerned in any way with private automatic exchanges both with and without connexion to a public exchange system. It will probably not rank as a general text-book on P.A.B.X.s, since practice abroad varies considerably, in fact, a study of other administrations' types indicates that this particular branch of automatic telephony appears to be a fruitful field for the adoption of such varied facilities as private users desire and some administrations agreeably furnish.

So far as British practice is concerned, however, Mr. Dennison is to be congratulated on the compilation, in a very comprehensive and excellent manner, of a long overdue text-book.

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BETTER, CHEAPER, AND LARGER TELEPHOTOGRAMS!

THE transmission of pictures by telegraphic means is coming to the front in the U.S.A., so it would appear from the latest information received from that country. For example, an enterprising firm in New York recently sent out 300 telephotographs of the latest feminine fashions to all parts of the States, and it is recorded that no less than 212 business orders were received in return.

The *Telegraph and Telephone Age* uses the term " broadcasting " in connexion with this adventure, but one is scarcely prepared on this occasion to accept the term in the specific sense in which the word is at present understood, and it seems more likely that there were separate transmissions to a number of towns, possibly with multiple addresses in each, and perhaps in due course our transatlantic friends will be good enough to amplify the present information.

This expression of doubt is by no means intended to detract from the fully acknowledged value of the system as such, but is due solely to a certain looseness in the lay press of utilising the verb *to broadcast*, which term in wireless and scientific circles has a very definite and circumscribed meaning.

Having revealed something of the censorious in his nature the writer hastens to record that the Vice-President of the R.C.A. Communications Incorptd. announces reduced rates for the transmission of facsimile pictures between New York City and London, which it is said has been made possible by the installation of new equipment.

A departure has been made on the basis of charging for pictures by the metric system. The former charge was $3.20 per square inch. The new rate is now approximately $2 per sq. inch, or exactly 32 cents per square centimetre.

The minimum rate is now reduced from $50 to $48 and the size obtainable for the minimum fee is now increased to 150 square centimetres, or approximately 23¼ sq. inches instead of 15 sq. inches.

The maximum size coming within the minimum rate of $48 is 150 sq. centimetres, or 4 by 6 inches.

The centimetre has been adopted, says *The Age*, because it is anticipated that it is only a question of time (short with Germany) when a picture service to Europe will be opened.

The new equipment mentioned above has been developed by Major Richard H. Ranger, design engineer of the R.C.A. The instrument is more compact than the old type and offers the *advantage of working direct from original pictures submitted without necessity of photographic copying*. At the receiving end it is no longer essential to use visible recording as the finesse of photographic recording is obtained directly on photographic paper.

On development this paper gives a copy immediately available to be delivered to the customer, and a 5 by 7 inch picture may now be sent complete, including developing and drying operations, at the receiving end in 30 minutes.

" Various refinements," continues my source of information, have been worked out to improve the sharpness of detail, so that far better results are obtained on printed matter as small as " eight-point " type.

Typewritten matter is now handled so expeditiously that a growing usefulness for the service is expected, as facsimiles of documents of all sorts may henceforth be handled backwards and forwards as quickly as letters are now exchanged between various parts of the same city.

J. J. T.

PROGRESS OF THE TELEPHONE SYSTEM.

THE total number of telephone stations in the Post Office system at Sept. 30, 1929, was 1,814,263, representing an increase of 10,336 on the total at the end of the previous month.

The number of stations working at Sept. 30 in London, England and Wales (excluding London), Scotland, and Northern Ireland was as follows :—

	No. of Stations at Sept. 30, 1929.
London	647,967
England and Wales (excluding London) ...	982,225
Scotland	161,623
Northern Ireland	22,448

The growth for the month of September is summarised below :—

	London.	*Provinces.*
Telephone Stations—		
Total at Sept. 30 ...	647,967	1,166,296
Net increase for month ...	3,527	6,809
Residence Rate Subscribers—		
Total	157,083	247,645
Net increase	1,361	2,067
Call Office Stations (including Kiosks)—		
Total	5,717	22,952
Net increase	15	501
Kiosks—		
Total	1,479	5,662
Net increase	34	114
Rural Party Line Stations—		
Total	—	10,526
Net increase	—	33
Rural Railway Stations connected with Exchange System—		
Total	17	1,230
Net increase	—	36

The total number of inland trunk calls dealt with in July 1929 (the latest statistics available) was 10,653,433, representing an increase of 1,150,626 or 12% over the total for the corresponding month of the previous year.

The outgoing international calls in July, 1929, numbered 46,774 and incoming international calls 49,742, representing increases of 11,031 (30.9%) and 11,236 (29.2%) respectively over July, 1928.

Further progress was made during the month of October with the development of the local exchange system. New exchanges opened included the following :—

LONDON—Colindale (automatic), Hillside (automatic).

PROVINCES—Crewe, Nantwich, Mumbles (automatic); Badingham, Brancaster, Comberbach, Crossford, Hunmanby, Kilmours, Lockeridge, Long Sutton, Terling, Tunstall (Lancs.) (all rural automatic); Bourne End and Canford Cliffs (manual).

and among the more important exchanges extended were :—

LONDON—Addiscombe, Battersea.

PROVINCES—Barnsley, Barrhead, Birkenhead, Eagley, Farnworth, Haslemere, King's Lynn, Sittingbourne, Sketty (automatic), Slough.

72 new overhead trunk circuits were completed, and 85 additional circuits were provided by means of spare wires in underground cables.

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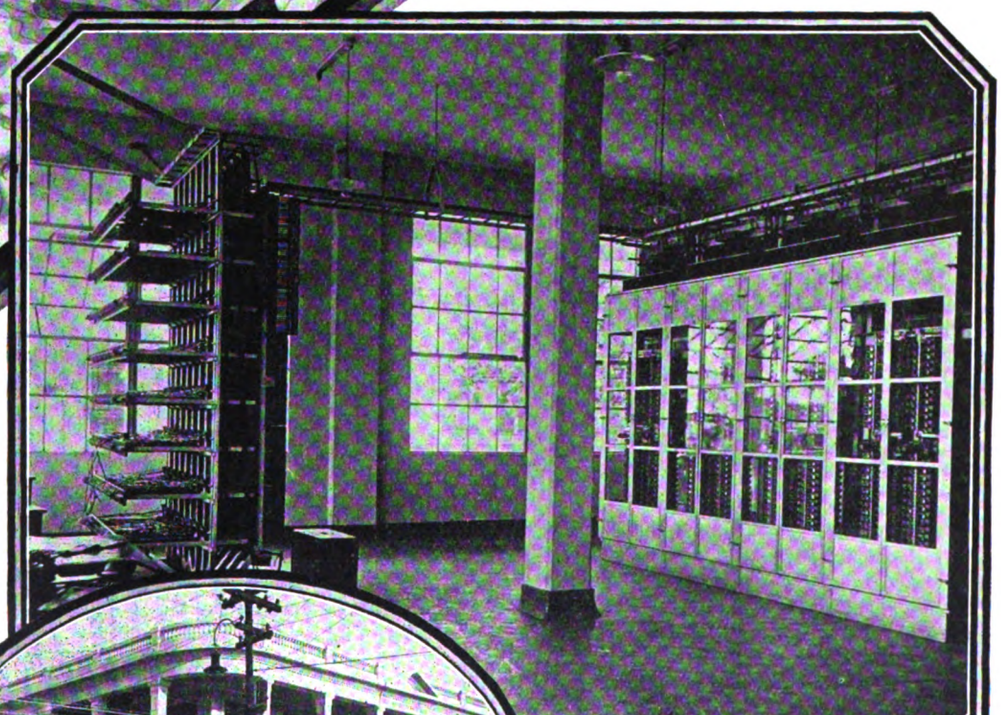

The above view is the Strowger Automatic switch-room at Port au Prince, Haiti. To the left is shown the exterior of the new telephone building, the second floor of which is occupied by the automatic equipment. Besides being of pleasing architectural appearance, this building is also fire and earthquake proof.

A

Manufac

Factory and Gene

For Australasia
For Canada
Elsewhere

American Electric Comp
International Automatic
Automatic Telephone M
The New Antwerp Tele

STROWGER

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t Au Prince Makes Progress in Telephone Development

ER the guidance of the United States Navy, the introduction of up-to-date ethods in the republic of Haiti has effected considerable improvement in general ns on the island and in many directions has placed the activities of its citizens on modern basis. One of the most important departments in which this change has complished is the telephone system.

he capital city, Port au Prince, was converted to Strowger Automatic operation in ere were only 104 telephone subscribers in the city. In 1927 when the new building n the accompanying illustration, was completed, with Automatic facilities to serve tations, the number of telephone subscribers had already increased to 800. Floor as reserved and plans made for subsequent additions of automatic equipment to ,000 additional stations, to be installed gradually as the demands for service * Six years of Strowger Automatic operation in Port au Prince furnish ng record of the stimulus this modern system gives telephone development, r it is used.

*Just recently the Direction Generale des Travaux Publics has placed orders with the Automatic Electric Company, Ltd., for 400 more lines of Strowger Automatic equipment, made necessary by the increased demands for additional service.

tic Electric Inc.

ger Dial Telephone and Signaling Systems
1033 West Van Buren Street, Chicago, U. S. A.
ice Offices in All Principal Cities

ORT DISTRIBUTORS
Automatic Telephones, Ltd., Sydney
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AUTOMATIC

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The
Telegraph and Telephone Journal.

PUBLISHED MONTHLY IN THE INTERESTS OF THE TELEGRAPH AND TELEPHONE SERVICE, UNDER THE PATRONAGE OF THE POSTMASTER-GENERAL.

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NOTICES.

As the object of the JOURNAL *is the interchange of information on all subjects affecting the Telegraph and Telephone Service, the Managing Editor will be glad to consider contributions, and all communications together with photographs, diagrams, or other illustrations, should be addressed to him at the G.P.O. North, London, E.C.*1. *The Managing Editor will not be responsible for any manuscripts which he finds himself unable to use, but he will take the utmost care to return such manuscripts as promptly as possible. Photographs illustrating accepted articles will be returned if desired.*

VOL. XVI. DECEMBER, 1929. No. 177.

LESSONS FROM MOTOR STATISTICS.

THE year book of the Motor Industry of Great Britain always interests us, not so much *qua* motorist or pedestrian, although it is full of instructive statistics (gratifying to the former and ominous for the latter), but rather as telephone men, because of the fortuitous relation between the development of motor cars and telephones both in this country and America. Excluding motor cycles, there were in the United Kingdom 1,205,990 motor vehicles on Jan. 1, 1928, and 1,330,456 in 1929. In the United States there were 23,253,882 motor vehicles on Jan. 1, 1928, and 24,493,124 in 1929. These figures compare with the telephone development in the two countries as follows :—

	Motors.	*Population per Motor.*	*Telephones.*	*Population per Telephone.*
1928.				
Great Britain ...	1,205,990	36.5	1,633,802	27.8
United States ...	23,253,882	5.1	18,523,500	6.26
1929.				
Great Britain ...	1,330,456	34.3	1,759,686	25.8
United States ...	24,493,124	4.9	19,341,000	6.6

A few years ago the development of telephones and motors in the United States was about level; the motor vehicles have now drawn ahead. In this country the motor development is catching up more slowly; indeed, in the year 1928, telephones rather more than maintained their lead, increasing, like the motor vehicles, by a figure of about 125,000.

The year book has a list of the persons per motor vehicle in the principal motor using countries. These countries, except that Italy and Belgium replace Denmark and Sweden, are identical with the principal telephone using countries. They may be divided into two groups :—

I.—COUNTRIES WHERE THE MOTOR DEVELOPMENT APPROXIMATES OR EXCEEDS THE TELEPHONE DEVELOPMENT.

	Persons per Motor.	*Persons per Telephone.*
U.S.A.	4.9	6.6
New Zealand ...	9.6	9.7
Australia	13.2	12.8
France	37.4	42.2

II.—COUNTRIES WHERE THE TELEPHONE DEVELOPMENT IS THE HIGHER.

	Persons per Motor.	*Persons per Telephone.*
Canada	9.1	7.2
Great Britain ...	34.3	25.8
Germany	117.2	21.4
Italy	215.5	111
Belgium	70.2	34.5

It will be seen that Germany, which is fairly well developed telephonically, is behind France and Belgium in motor development.

The only lesson to be drawn from these tables is one which we need not elaborate, since we have touched upon the question before. It is this that, seeing how the motor car has outpaced the telephone in the United States, it is not the question of private ownership of the telephone system which is the deciding factor—as every economist and psychologist already knows—in the superior telephonic development of America.

STEAM HAMMERS AND NUTS.

IN those gossipy portions of the text-books of our youth which sought to humanise the hardest of hard facts, we used to read that the Nasmyth steam hammer was so powerful that it could be employed to drive piles and so delicately adjusted that it could be used to crack nuts. The auditing machinery of a State service may be likened unto this famous implement. It can come down like a "hundred of bricks"—if we may use so homely an expression in connexion with so august an institution—on the miscreant who is trying to defraud the State of a considerable sum; it can make its pressure felt on the member of the public or official who has failed to sign or cause to be signed some agreement or form in connexion with a two-and-sixpenny or twopenny-halfpenny matter.

We are moved to these reflections by an excellent article by a contributor on the subject of "Risk." Mr. LANE, in making a plea for the abolition of certain forms and formalities at present requisite when a subscriber desires a small removal undertaken, or an extension bell supplied, points out that whatever checks are imposed, whether justifiable or vexatious, by an undertaking

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which trades and necessarily allows credit, *some* risks must inevitably be taken. He is evidently of opinion that though it is a fascinating and admirable property of the steam hammer to be able to crack nuts, this is not perhaps an economic or ideal task for that instrument.

It has of course to be remembered that a service like the Post Office telephone service, being under Treasury control, and subject to audit by the Comptroller and Auditor-General, and to criticism by the Public Accounts Committee and by the public and Parliament, does not enjoy the same freedom of action as an ordinary commercial concern, which, subject to such checks as its managers and accountants may consider adequate and reasonable, needs regard no external criticism. We nevertheless realise that the present procedure for small removals, &c., is amenable to improvement, and our readers will no doubt be interested to learn that the Administration already has the whole question under consideration.

HIC ET UBIQUE.

MR. POWELL-JONES, of the Telephone Development Association, in the paper which he recently read before the Telephone and Telegraph Society of London, gently chaffed us because, as he said, advertisers in this, a telephone journal, did not always quote their telephone numbers in their advertisements. (As a matter of fact, most of our advertisers do quote them.) Mr. Powell-Jones has since discovered on analysing the advertisements in the widely read American journal *Telephony*, that 72 out of 73 firms making display advertisements omit their telephone numbers. There must be some underlying reason for this at which we cannot even guess. We should have thought that in America the telephone number was almost an integral part of a man's address.

A complaint of a familiar pattern appeared recently in the *Daily Telegraph*. It was that the writer's calls (i.e. outward calls) cost him 5*d*. apiece, if he makes 100 calls a quarter. The reason why the calls appear dear is, of course, that he makes so few. If he made only 15 a quarter, they would cost him about 2*s*. each—and so on. Such critics sometimes forget that even with a low unlimited rate of about £8 10*s*., each call would cost a subscriber over 5*d*. if he made only 400 in a year. They forget also the incalculable advantage of being available on the telephone—a boon no call office service can replace.

The *Bournemouth Echo* says with regard to

"THIS DIALLING BUSINESS.—A friend of mine has decided that the automatic telephone is not all honey—as it promised to be from the praise that preceded it. He has found that his telephone account is much heavier than he bargained for, and it has been officially explained to him that the automatic 'phone records as well as puts through the calls automatically. It therefore seems that this heavier account is the penalty of incorrect dialling. The man who makes mistakes has to pay for all the wrong numbers that he dials. This is the best thing I have yet heard on behalf of the automatic. It will be some consolation to me to know that the duffer who calls me up erroneously has to foot the bill for his mistakes."

We hardly like to spoil the aggrieved gentleman's satisfaction by remarking that the duffer can call up the operator and inform her that he has dialled a wrong number for which he should not be charged.

It would appear that in Kenya Colony the Telegraph Administration published in the local Press a list of telegrams which for some reason or other could not be delivered. A question was asked in the Kenya Parliament whether a more thorough system for tracing addresses, &c., &c., could not be adopted. The reply was as follows :—

"The system for delivery of telegrams now in operation in the Department provides for full and every reasonable enquiry being made with the object of effecting delivery even in those cases in which the addresses would be considered as wholly insufficient by most other Telegraph Administrations. The publication of the lists referred to is an additional and special measure not in general use elsewhere. There is no record in the Post and Telegraph Department of any recent complaint of non-delivery of an adequately addressed telegram of which particulars were published."

Some people are never content.

The *Spectator*, always interested in natural history, says with regard to the protection of birds from power-wires :—

"Apart from humanity, they would be liable to lose a great deal of money by such short-circuiting, which might divert the county supply for hours. One or two instances have occurred in the past, even in England, but the most elaborate means of prevention have been found necessary in countries where very big birds are common, such as storks. One would expect that those tame and attractive cranes, called "native companions," would be the most likely victims in Australia, as the storks undoubtedly are in Palestine. Generally on this subject there is still need in Britain for a much wider distribution of the corks, which the Post Office are ready to affix to telegraph wires over reaches where the need is greatest."

On the other hand, the birds from which the British telegraph and telephone system suffers most are *canards*; from which no amount of corks will adequately protect it.

The annual report of the Posts and Telegraphs Department of Nigeria for 1928 shows that the number of telephones working is now 2,041. The total number of telegrams dealt with increased from 804,486 to 879,647.

Our well-known Paris contemporary, *La Revue des Téléphones Télégraphes et T.S.F.*, is publishing a translation of our series of articles "How to Improve the Telegraph Services." It makes the following introductory comment :—

"The telegraph crisis rages more or less in all the nations of Old Europe, and if America seems to have escaped it up to the present, this is no doubt due rather to the geographical conditions of that country than to its methods of working. It is in fact conceivable that in a country 15 times larger than France the telegraph can struggle more successfully than with us against the competition of the telephone and motor car. Is that to say that there is no remedy and that we must look on with resignation at the decay of that mode of communication at the very moment when experts are endowing it with the prodigious devices of which our readers are accustomed to find long descriptions in our pages?

This is the question which our excellent confrère, the *Telegraph and Telephone Journal*, has put, on the other side of the Channel, to British telegraphists. All categories of the staff bend in their turn over the invalid, and the replies—I almost said the consultations—are interesting and numerous.

Why should we not benefit by them?"

CONTRACT NOTES FROM THE NORTH-WESTERN TELEPHONE DISTRICT.

THE following appeared in the *Preston Herald*, Friday, Nov. 1 1929 :—

A well-known townsman told me a glowing story to-day.
He had been waited on by a Government official—(no, not the Tax Collector)
Who courteously explained the cost and the many advantages of a telephone;
Either at home or at the office, or both.
My friend had little use for such an instrument—
But the Government man was so disarming, agreeable and persuasive
That he nearly succumbed;
Some salesman, that civil servant.
It is pleasant to chronicle such praises;
Too often we have nothing but grumbles.

It is cheering to know that in some quarters at least our efforts are appreciated.

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THE WORK AND METHODS OF THE TELEPHONE DEVELOPMENT ASSOCIATION.*

BY H. E. POWELL-JONES.

I AM quite frequently asked to describe briefly what the Telephone Development Association is—what the letters T.D.A. stand for.

What we are really, of course, is "Eat more fruit" applied to telephones, and just as the "Eat more fruit" movement aims and succeeds in increasing the business of fruit growers, fruit shippers, fruit dealers, both wholesale and retail, fruit carriers and others, so this "Use more telephones" movement is intended and designed to increase the turnover and business of all those who are in any way connected with the production and the supply of plant and material of all sorts required to create and maintain a complicated modern telephone system. This embraces, as you will see, a very large body of trades. There are, for instance, to name some of the principal ones, the exchange equipment makers, instrument makers, cable makers, drawers of copper wire, battery makers, duct makers, road contractors, who take up the roads for laying the conduits, and a whole host of smaller but nevertheless important people—smaller only in comparison with capital invested—dependent to a greater or less degree on these: insulating paper makers, furnishers of cotton, silk and yarn which are used in the flexible cables; gold, platinum, lead, and so on, almost *ad infinitum*.

There is a Post Office list of trades which benefit by the issue of orders for telephone plant, and it contains just over 50 trades. One cannot stimulate the demand for telephone service without automatically giving a stimulus to every one of these 51 trades. Incidentally—though I think that is not perhaps the right word, because I was going to speak about the employment aspect, and just now the burden of unemployment certainly falls like a heavy hand upon every industrial nerve centre in this country; the solution of that problem constitutes perhaps the most serious internal problem confronting the Government of the day, to whatever political party it may happen to belong. Incidentally, then, you will not be slow to realise what I may call the employment aspect of this movement for a more rapid, widespread development of the telephone habit in this country. You will agree, too, that this many-sided telephone manufacturing industry lends itself perhaps more than any other industry to the idea of communal advertising. It would be superfluous to advertise in the newspapers that A's telephones are better than someone else's, that B's cables are superior to someone else's, that C's telephone poles last longer than anyone else's, that D makes better porcelain insulators than his rivals and that E's copper wire is better drawn than anyone else's in the trade. The public, when they ask for a telephone, merely want an efficient telephone, and it is a matter of perfect indifference to them, so long, of course, that it is British, whether the instrument is made by A, B or C. They do not want to know who makes the cable or the wire clamp supporting the insulator, or who supplies the timber or anything else. So instead of, or as well as, each firm doing individual advertising of its own products, we have brought together in the T.D.A. an organisation to advertise the product of the whole industry, and to increase the demand for that product which, in this case, is telephone service. We are, in one word, the propagandist and sales department for the industry as a whole, and I cannot help thinking that it does say a good deal for the enterprise of British manufacturer that they are all unanimous in putting their hands in their pockets to maintain this organisation, the results of whose work and activity must, in the special circumstances of the case, be very largely indirect and only visible in the bulk after a period of some years.

It is rather fashionable just now in some quarters—perhaps it has to a certain extent always been one of our typical national characteristics—to talk and write pessimistically about British industry and the immediate industrial future. Why this should be so is not quite clear. Surely there is something rather exhilarating and encouraging in the contemplation of what is going on in our country just now. Here is a nation showing extraordinary patience and a very high degree of economic resilience. Here is a country which has been for ten years facing the strain of our war debt repayments, of unexampled, unprecedented taxation, of abnormal unemployment. And here is this country still carrying on, smiling, I might almost say; at any rate, reasonably cheerful. We are spending more on amusements, motor-cars and luxury expenditure generally than ever before in our history, and yet still we managed in 1928 to subscribe about 37½ millions of pounds in response to the admirable suggestions which are so commendably advertised by the National Savings Certificates Organisation. These general economic considerations cannot, I believe, altogether be ignored from the telephone point of view because it must surely be true that every tendency in the direction of an improvement in the general standard of living of our population and of any other population for that matter, is itself an argument for development of the telephone system.

If we take a gloomy view of general industrial conditions, our development forecast, or rather the spirit in which the statistical material is interpreted, will be gloomy and meagre. But if optimism prevails, that optimism will be reflected in the growth forecast and again in the advance provision of telephone plant, and also in the enthusiasm in which the service is sold to the public. I think this question of the forecast in all business is extraordinarily important, though a great deal also depends not only on the forecast itself but on the prevailing mood of those who have to implement the forecast. Is it too much to say that the whole history of civilisation is the history of the growth of forecasting? I think not. I think that a fair definition of a savage is that he is a man who does not forecast.

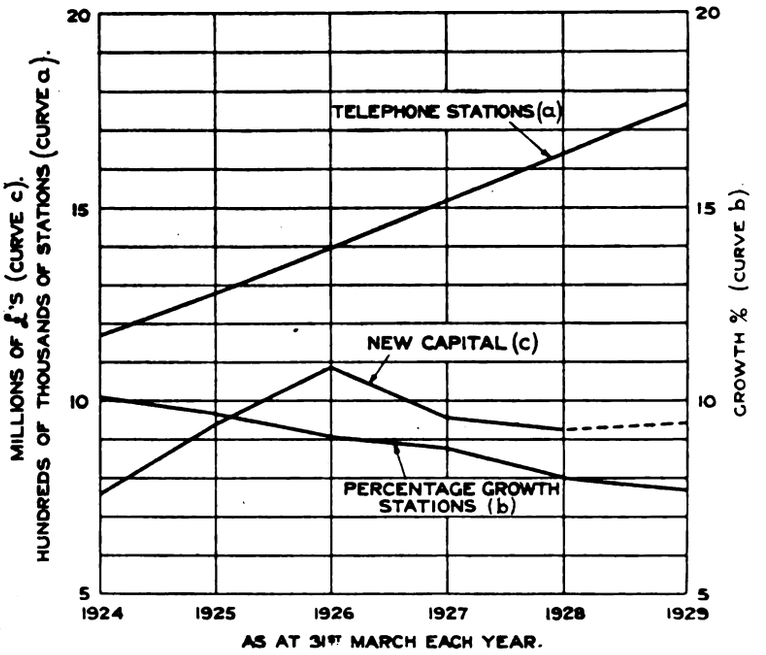

FIG. 1.—CURVE SHOWING RELATION OF GROWTH OF STATIONS AND PERCENTAGE GROWTH TO NEW CAPITAL.

Mr. W. T. Foster, a rather well-known American authority on this question of forecasting, says, not in connexion with the telephone business, but I think it applies, "When a man enters business he enters a forecasting profession. He may forecast badly or well, but forecast he must. He may scorn business forecasters, but he cannot help being one; he may shun statistics but he cannot help using them. Since business is essentially risk-taking with the expectation of profits, every enterpriser runs risks and as a risk-taker he is necessarily a business forecaster." All businesses, then, all enterprises, have to forecast and to take normal risks. These risks vary according to the nature of the enterprise or to the particular product or commodity. The supply of telephone service is a business and a very important one too, and one that in this respect of taking risks is especially fortunate, because though the normal risk has to be, and ought to be, taken, that risk is much less than in most businesses because, as a rule, there is little or no competition, and again for the reason that telephone plant is never wasted or subject to the whims of fashion as is, for instance, the material out of which ladies' shoes are wrought. Who, for instance, would have forecast a tremendous demand for reptile skins? Only those who were determined that they should be in demand and who set out and created that demand. Telephone plant, it is true, taking the worst view and allowing for most adverse circumstances, may prove to have been acquired and put into service a little before its time. But all experience, both here and elsewhere, goes to show that before very long it begins to be used and to earn its keep, especially if determined efforts are made to get in new subscribers whenever and wherever a temporary surplus of spare wires arises. I mention this question of prevailing pessimism because I think it is the worst enemy of the propagandist. There must be no room for it nor for lack of enthusiasm in our organisation. The telephone industry at any rate does not subscribe to any defeatist policy. It scorns pessimism and it is making an honest and sincere attempt to improve both its present and future prospects, with the additional encouragement that in so doing it is making a definite and appreciable contribution not only towards the problem of providing permanent and increased employment in all sections of the industry, but also towards a higher degree of national efficiency in the matter of communication facilities.

It is very encouraging, I think, to observe the tremendous strides that have been made during the last few years toward a more proper and adequate conception of the true importance of communications in this modern world of ours. You know very much more about it than I do, but there are outstanding examples on every hand. Two of them are the transatlantic service and that constant enlargement of the network which places every individual telephone subscriber in this country in touch with a score or so of European countries. In fact, keeping up the note of optimism, I suppose it will be safe to say that by the end of the year you will be giving us Australia

* A summary of the paper read before the Telephone and Telegraph Society of London.

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as a matter of course. Your department has taken these two great achievements, as it takes your other achievements, in its stride, but if both or either of them had been created and perfected by a less modest organisation than the British Post Office, say, for instance, a commercial company that believed in advertising itself, perhaps the general public would have appreciated still more fully what is going on in the communication world and what is being done to make their life more efficient, safer and more commodious. I think, too, they would by now have made a much fuller use of the facilities you have provided, but then I need hardly say I am very firmly of the belief that it does pay to advertise.

I will mention one more instance of this importance of communications.

At Amsterdam this summer, there was held the biennial congress of the International Chamber of Commerce. Now the agenda of a body like that presents in tabloid form a picture of the subjects in which business men of all nations are deeply interested. On the agenda there was a whole section devoted to Communications. As a matter of fact, there is a permanent section of the Chamber's work devoted to the subject. I was rather pleased to see on this year's agenda that Communications were set out in what I believe to be the right order of importance. No. 1 was Telephones, No. 2 Telegraphs, No. 3 Mails. Here is another reference I came across the other day in the newspapers: "Never was the highest possible degree of cheapness, efficiency, speed and volume in all forms of written or spoken communication so necessary to the well-being of British industry." That is a good and true note and I doubt whether it would have occurred to any British journalist to write that sentence ten years ago.

Now I go back to 1924, when this Association was born. That there was very urgent need for somebody to do some selling at that date is made clear by the comparative figures then available. I need not go over them; they are all quite familiar. One gets into the habit of repeating these figures and I sometimes think they lose their force with repetition and their full significance is not appreciated. Briefly, the United States headed the list with 146 telephones per thousand inhabitants; Great Britain was 14th with 26. We have now gone up to 36, a gain of 10 points. Incidentally, I notice that the Bell System in America are cheerfully going to spend this year 110 millions sterling on extension of plant and service improvement. That is more than the total book value of our entire system. That figure rather disposed of any suggestion that even in America are they approaching saturation point. It will be an inducement to all of us interested in telephone growth here to take courage and confidence and go full steam ahead. I do not want to labour those figures. Figures are sometimes said to prove anything, but I have made an attempt here to illustrate our comparative telephone density in the light of one common factor, and that common factor is that, whatever nationality we are, we have all got money to spend. I know it does not always feel like it at the end of the month, but at any rate on paper, we all have money to spend. That is common to all countries, and if we plot telephone density in comparison with individual wealth, I think we have a fair basis of comparison. With this diagram, Fig. 2, I try to show you what I mean.

The normal line of telephone development in conjunction with individual wealth is the line to which the majority of the x's, representing individual countries, approximate. The countries to the left of the line are, comparatively speaking, over-developed telephonically in relation to their wealth and those on the right, with Great Britain rather prominent, are under-developed telephonically. The key to the respective countries is:—

(1)	... ...	United States.	(9)	... ...	Germany.
(2)	... ...	Canada.	(10)	... ...	Great Britain.
(3)	... ...	New Zealand.	(11)	... ...	Netherlands.
(4)	... ...	Denmark.	(12)	... ...	Belgium.
(5)	... ...	Sweden.	(13)	... ...	Austria.
(6)	... ...	Australia.	(14)	... ...	France.
(7)	... ...	Norway.	(15)	... ...	Argentina.
(8)	... ...	Switzerland.			

Going back again to 1924, you must picture me a rather forlorn, lonely little man in the middle of London, told to go away and find some offices and furnish them—with a telephone, of course—and engage staff and create the telephone habit. Now you cannot create the telephone habit, or any other habit for that matter, in five years, but it can be created just like certain other habits. Take the cigarette habit. We used not to smoke cigarettes in this country; it is entirely an artificial growth. I noticed in a newspaper this morning that the cigarette habit in America has now reached the stage at which the average consumption per head is 1,000 per year, an average of three a day, including babies and old women who don't smoke! Another habit created artificially is the holiday habit. That owes its inception to the skill with which railway companies and the Mayor and Corporation of places like Margate and Blackpool have instilled into our minds the idea that Blackpool is really a bracing place and that you will enjoy a cheap trip on a certain railway. If I had time, I should like particularly to mention and to pay tribute to the Underground advertising. A few years ago, when traffic conditions were really at their worst, one used to travel in an underground carriage, hanging precariously to a strap under really impossible conditions for a civilised nation to travel under. But on a level with your eye was the most delightful picture of the place you were going to. Now that advertising lifted your mind out of the discomforts of the present by showing you those delightful little rabbits you were to see at Kew.

I must enunciate here one or two principles about advertising to illustrate what we have in our minds. The first principle, I think, in all good advertising is that you must have the goods. And, *vice versa*, that it is no good having the goods if you don't advertise them. Going back to a few years after the war, you will remember how motor-car manufacturers were busy creating a demand for cars. They built up waiting lists. The first manufacturer who could deliver cars collared practically the whole of the lists.

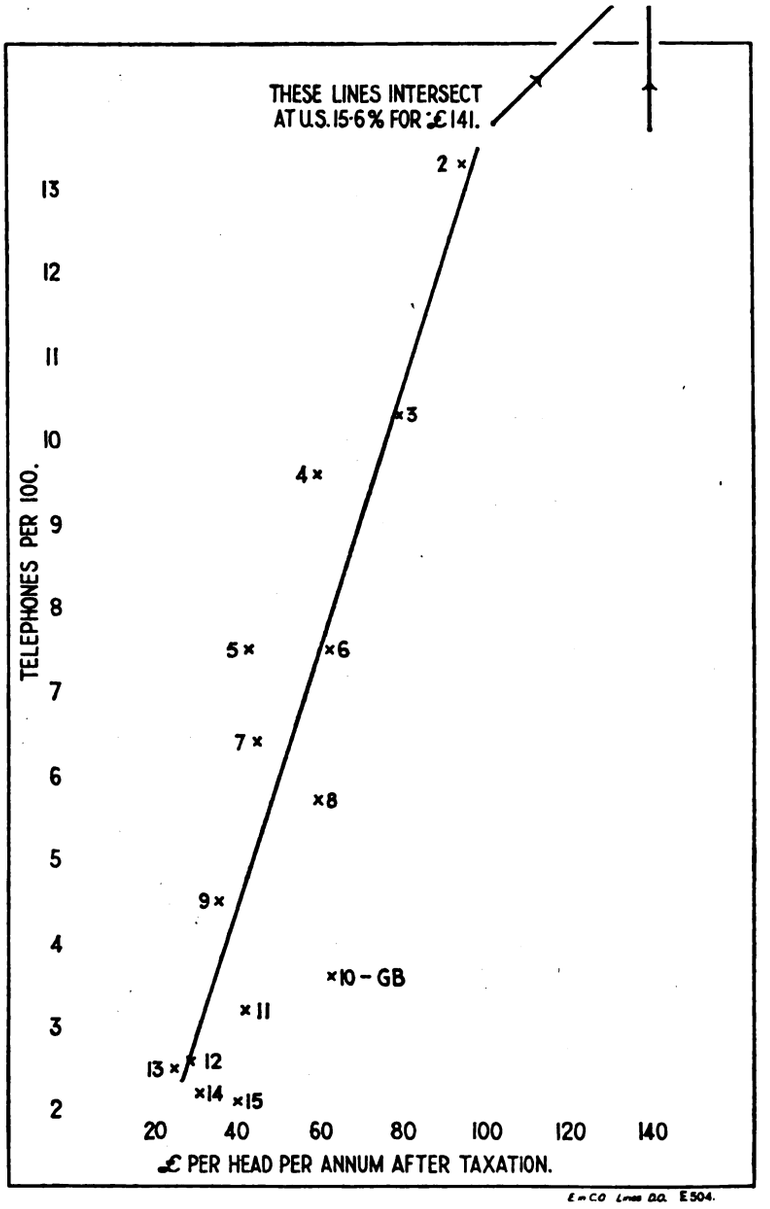

FIG. 2.—THE FIGURES IN THE GRAPH (1-15) REFER TO THE LIST OF COUNTRIES IN THE PREVIOUS COLUMN.

Here we are, then, in 1924, setting out into unexplored territory with the possibility of making very dreadful mistakes and with the consciousness that we could not control the supply of the product for which we were seeking a demand. It was an experiment that had its risks because all advertising experience insists that you can get a man or a woman to ask for a thing once, and if you cannot then supply, it is much more difficult to do it a second time. If you create a dissatisfied applicant it does a lot of harm because he or she becomes a focus of discontent. We recognised in those days of 1924 that anyone standing up to praise the telephone became a target for all sorts of critical sneers, as well as the natural prey of all the well-known cranks all over the country. It falls to us, in the course of the very large correspondence we now have, to pass on to District Managers all over the country, all sorts of letters of complaint. Well, now, I want to make it clear that the spirit in which we pass on those letters to District Managers is not that of associating ourselves with the complaints. We regard ourselves entirely as a funnel through which this kind of correspondence can pass without doing any harm, perhaps even doing a certain amount of good. Some funnels have filters. We like to think we have one in our organisation, and we filter out all the

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unnecessary abuse that comes into these letters. What we allow to pass through are the nice words that are very frequently said about the telephone service and the Department. Do not think of us, please, as necessarily associating ourselves in the slightest degree with these letters of complaint which are passed on.

In 1924 the attitude of the Press, I think, towards telephones was very different from that to-day. I believe it is true to-day to say that you get more friendly, intelligent comment on the value of the telephone service in this country than you did five years ago. Practically without exception, those old sneers have disappeared.

I am going to show next the first advertisements we issued, our first plunge into the icy waters of public indifference. We know now, in the light of our further knowledge, that they were very largely wrong in conception.

If you have an unpleasant subject to advertise, you must do the best you can. But do not bring this into telephone advertising. The telephone is not only or chiefly a thing for emergencies; it is a thing for every-day fun and comfort and convenience. It is a very comforting reflection, I think, that old Mother Nature, in spite of all her faults, has implanted in us a sort of subconsciousness that makes us think of things like fires and burglaries as always happening to the other fellow. So in our telephone advertising we do not want to suggest that the telephone is a thing for emergencies because they always happen to someone else who is on the telephone. We want to suggest that the telephone is part and parcel of daily life.

Then follow a long series of advertisements in the Wembley Exhibition programme.

The next is the first "coupon" advertisement issued.

Here is our most improved slogan—"half-a-crown a week," which is based upon the current fashion of budgeting our income on the instalment basis, sometimes known as the "never, never" system. The booklet describes the various uses of the telephone and invites people to send for a form of agreement or for an official to call for an interview. Of the names of all the senders of post cards, 73% appear in the directory in the next issue. That is a great tribute to the way in which those inquiries are handled by your Department.

I would ask you to keep in mind the class of people we are trying to reach by this advertising. I do not know that it can be closely defined beyond saying loosely that it is the "lower middle classes." We are not advertising for the cream; you have that already. We are trying to get below that, and more particularly we are going for women, as they are the controllers of household expenditure. They are the people who get what they want sooner or later, by fair means or foul: if *she* wants a telephone she will get it sooner or later. We choose media for advertising which have a deliberately feminine appeal.

Here is another type of advertisement—an appeal to those who control the purse of the nation. In all this next series we were making a definite appeal to Parliament to realise the value and importance of the telephone industry.

(At this point of the paper, a number of slides were exhibited illustrating various phases of the Association's advertising campaign, composite pages of provincial newspapers featuring telephone service, &c.)

A "routine" item of our daily work is to write to people who do not put their telephone numbers in their advertisements. It is all wrong for any firm to start advertising without stating their telephone number, an essential part of their address. A difficulty we have here is that some of our own firms, the manufacturers, are almost the worst offenders in this respect. They will not put their own numbers in. There is evidence of this in the current (October) number of the *Telegraph and Telephone Journal*. *Quis custodiet ipsos custodes?*

We did a whole series of Christmas advertisements on the same lines, which was very successful. I would like to tell you about exhibitions, but it is a question of time, so I will only say this: that we are making a definite attempt through these exhibitions to get to the younger generation—the modern, post-war vintage.

Pre-war people who have got along so far without a telephone are rather hopeless, but the new generation has speeded up; they expect to find a telephone in their homes just as much as they expect to find the wireless, electric light and a bath or two. So we are making a special effort to get at the schoolboy and schoolgirl, which is the underlying reason in encouraging these visits to exchanges. Eighty-five schools have already acted on this suggestion this term and have sent their scholars to get an idea of what telephone service means in modern life.

I have not time to deal with many other phases of the Association's propaganda.

As regards the direct results of all this work, of course, they are only partly traceable, and we shall not expect to see them except in bulk in the annual increase figures. They are certainly improving, as you know, but of course we do not claim credit for the whole of that increase. I should like to show you how the position is as compared with one or two of our neighbours. This diagram shows the line of growth, percentage growth, and the capital invested.

It is often said that monopolies are slothful, because they have no competition to meet and are not under the necessity of struggling to improve their methods, and keep advancing. This is a false idea if applied to telephone service. The telephone, though administered by a monopoly, is in daily competition with a long and increasing list of time- and labour-saving conveniences. The Greek currant growers are spending money to make English housewives buy currants. When you have the public being urged to use more gas, drink more milk, use more paint, eat more fruit, &c., telephone service is in competition with all these other claimants for the spare money of the British housewife. Surely we must preach "Use More Telephones" with as much insistence, as much skill and as much confidence as do these energetic competitors of ours. That is the point I want to make; that just as the public needs an incentive to buy, so an administration has an incentive to sell. Do not misunderstand me about this. I say at once that we all recognise that the Department possesses the highest incentive of all—their high conception of duty to the State and their ideal of conforming to well-established traditions of the Service.

I have tried to give you in brief and with due allowance for that natural modesty which distinguishes every advertising man, a review of some of the directions in which this Association is setting about its self-imposed task of blowing your telephone trumpet, of letting people know about the value of your service and of lifting this country up from that lowly position we saw on the chart, but I feel I shall have wasted not only your time but also the much appreciated opportunity you have thus provided for me if I have not succeeded in drawing a picture of an Association genuinely anxious to be your friend and to supplement the good work which you are doing and do all we can to remove some of the difficulties that, as we very well know, confront you. If, occasionally, we seem to criticise, what is the use of a friend who does not tell you when you have a smut on your nose? Please take it as criticism offered in the most friendly and helpful spirit.

My last word is this: that one of the really pleasant features of our work is the encouragement we get from District Managers and telephone men and women all over the country, from whom we get helpful suggestions and kind criticisms. We want as many suggestions as you can give us; we appeal for more. Tell us what you want, and if funds permit and if our ingenuity is adequate to your demands, we will do it, because, after all, we are all treading the same road and heading towards the same goal and that goal is a telephone, and a well-used telephone, in every office, shop and home, where the presence of one of the most useful adjuncts to daily life can reasonably be expected.

CORRESPONDENCE.

HOW TO IMPROVE THE TELEGRAPH SERVICE.

TO THE EDITOR OF "THE TELEGRAPH AND TELEPHONE JOURNAL."

SIR,—With all due respect to W.H.L. and J.S., and the spirit which prompted their deliberations, I submit that any attempt to increase the telegraph tariff would be the signal for a further outburst against State control. Far from helping it would hinder us in the project.

I, too, agree that the shilling telegram has outstayed its welcome. But, like the majority of contributors, our Carlisle colleagues would appear to confine their propounding to within a certain circle; in fact, the senders' point of view does not seem to have been considered (and he is the man that *must* be studied). This omission has been conspicuous throughout the series. To me the explanation is simply that the writers' experience is bound up within the narrow confines of the Department. I do not wish to disparage but it would be interesting to know how many have been engaged elsewhere.

It cannot be too often repeated that a very large proportion of the public are not telephone subscribers. These people would feel the effect of an increase in rates based on mileage, for they sometimes have occasion to send a telegram of an urgent nature destined to travel two or three hundred miles. They comprise the majority of the populace, and that being so, the factor of time alone should be utilised for the purpose of compiling a deferred tariff, thereby hoping for an increase in revenue by enticing quick returns. Apropos, one must be careful not to mention the word "profit." But, providing that they do not accrue at the expense of the staff, or the public, and that substantial reserves are set aside for general improvements, why on earth should it be considered a greater sin for the Department to increase the talents than for a private company to do likewise?

Apart from the comment in your footnote, one trembles to think of the effect among members of the Stock Exchange on being compelled to pay 3*s.* for 12 words for their traffic to (say) Dublin. Although, in my opinion, business people, generally speaking, may find it convenient to take advantage of deferred rates, yet there are many "houses" whose traffic must of a necessity be of an expeditious character in every instance. They certainly would not see any humour in paying extra charges for the purpose of balancing our traffic receipts. Neither would they see the logic in an increase of 50% should the establishments of their agents, representatives, or customers, be situated over 100 miles away; even if we offer the very small potato of 30 minutes maximum delay to the office of destination—which is, not by any means the same thing as the place of delivery.

It is submitted that guarantees would do more harm than good—far better omit them. And if ever an inland deferred tariff were introduced, the method of application would be the fundamental basis of minimum delay on the fully-paid urgent traffic, for the service of which it would be fatal to increase the existing flat rate.

W.T.L. (*C.T.O.*).

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C.T.O. NOTES.

Promotions.

MESSRS. W. A. LOCK, Superintendent (Lower Grade to Higher Grade), W. G. Godden, Assistant Superintendent to Superintendent Lower Grade, C. Buxton and F. W. Dare, Overseers to Assistant Superintendents.

Retirements.

Miss A. M. Finch, Supervisor (H.G.); Messrs. A. Hardman, Overseer; and E. P. Ellis, Telegraphist.

Obituary.

We regret to announce the death of Mr. Carl Radway. He was a very popular member of the Threadneedle Street B.O. staff and an unusually bright and cheery companion.

Gardening.

The C.T.O. Gardening Association held a very successful Autumn Show. The fruit and vegetable classes were well contested, and particular mention should be made of the vegetables shown by Mr. H. Savage, the dainty arrangement of Michaelmas Daisies staged by Mr. H. Lang and the tempting apples shown by Mr. C. Land. The Cable Room are now leading the Inland Galleries in the competition for the Hooper Cup.

Sport.

Chess.—The Seventh Season of the Centels Chess Club was opened by the President and Vice-President (Mr. D. M. Ford and Commander Grattan). The prizes were presented as follows:—

The Laxton Cup	Mr. D. J. Charlton.
The President's Prize ...	Mr. J. Fennell.
The Vice-President's Prize	Mr. F. Lobb.
The Junior Knockout ...	Messrs. Evans, Irons, Taylor and James.

The programme for 1929-30 includes Civil Service Cup, Civil Service League, Divisions 3 and 5 and London League C.

THE INSTITUTION OF POST OFFICE ELECTRICAL ENGINEERS: BOOTH-BAUDOT AWARD.

THE Council wishes to call attention to the "Booth-Baudot Award" of £5 which is now offered annually for the best improvement in telegraph, telephone or wireless apparatus systems. The award for the year 1929 is governed by the following conditions:—

1. The award will be restricted to employees of the British Post Office.

2. Applications for the award should be made between Jan. 1 and Mar. 31, 1930, and such applications should refer to improvements made, or suggested, during the twelve months ending Dec. 31, 1929.

Attention is drawn to the fact that recipients of awards via the Post Office Awards Scheme in respect to any improvement in telegraph, telephone or wireless apparatus or systems are eligible to apply for the Booth-Baudot Award in respect thereto.

3. The award may be withheld at the discretion of the Council of the Institution of Post Office Electrical Engineers if, after full consideration of the applications received, the adjudicators appointed by the Council are of the opinion that no award is warranted.

4. Applications for the award, accompanied by full details of the improvement, should be addressed to the Secretary, The Institution of Post Office Electrical Engineers, G.P.O (Alder House), London, E.C.1.

November, 1929. H. L. DUNSTER, *for Secretary.*

RETIREMENT OF MR. W. J. MARSH.

THE staff of the South Wales District held a Whist Drive and Social in the Y.M.C.A. Lecture Hall, Cardiff, on the evening of Nov. 1, to do honour to our late Traffic Superintendent, Mr. W. J. Marsh, on the occasion of his retirement. There was a large and representative gathering, the company numbering about 80, and among the guests of the evening were Mr. J. S. Terras, Superintending Engineer, Major D. K. Hopkyns, Assistant Surveyor, and Col. S. H. G. Dainton, Postmaster of Cardiff.

The presentation, which took the form of a handsome walnut compactum, was made by Mr. Waite, the District Manager, who referred to the excellent work done by Mr. Marsh, particularly in connexion with the transfers of the Cardiff and Newport Exchanges. Mr. W. McDonald, Traffic Superintendent, Class II, also paid tribute to the sterling qualities of Mr. Marsh, and the latter replied very suitably. A most enjoyable evening was completed in song, the vocalists being Misses G. Morgan and L. Purnell and Mr. A. W. Trethewy.

LEEDS DISTRICT NOTES.

A MEETING was held recently under the chairmanship of the Postmaster-Surveyor of representatives of all departments of the Leeds Post Office, including the Engineers, to consider how best to stimulate interest in and increase the circulation of the *Telegraph and Telephone Journal.* Various views were expressed and suggestions made.

At the end of October the total number of Telephone Kiosks working was 590, of which 361 are now artificially lighted. The number that are now working in the Leeds Head Post Office area is 250. The collections obtained from the Leeds boxes during the month of October were £735 which constituted a record.

A feature of the Kiosk development has been its extension to rural districts.

We have many visitors to Leeds Exchange, but rarely has one arrived so unexpectedly as did the Postmaster-General recently. The visit, which was none the less welcome because of its informal character, was followed by equally surprise visits to the Keighley Exchange and to a small exchange at Steeton, where the caretaker shares with a Sub-Office Postmaster, of whom we have heard, the felicity of having had a heart-to-heart talk with the head of the service.

Leeds Automatic Exchange was opened in May, 1918, but so great has been the development of automatic equipment since then that it is with something of the feelings of a great grandmother gazing at the latest bud on the family tree that we in Leeds await the opening of our first rural automatic exchange, a tiny mite of 8 lines now almost completed at Lothersdale, a little village set in some wonderful Yorkshire scenery. From accounts which reach us of the working of these tiny robots in other districts, they give an almost perfect service, and we have been able to re-assure one subscriber who expressed some misgiving at losing touch with the philosopher at the local Post Office, who is at present the helpful guardian of his telephone service.

Much of the humour of the telephone service is to be found in happenings at the small exchanges rather than in those hives of industry which are the nerve centres of commercial cities. At a little village in "Bronteland" the Post Office is situated next door to the local "pub." Outside the Post Office is a kiosk which is classified as "Attended" whilst the Post Office is open. One day recently a caller went to the kiosk to make a trunk call, and when asked by the telephonist to "please pay at the counter," he responded with, "Wheer, Miss, at t' Black Bull"? Can it be that a new source of call office discrepancies has been tapped?

The Bradford Post Office Ladies' Swimming Club has concluded a very successful season. The membership was so much higher this year that a larger swimming bath was rented, and to this latter must be attributed the extraordinary mistake of one telephonist who, dressing in a hurry to catch a train, stepped out of her cubicle straight into the bath. She was rescued, firmly clasping an attaché case in one hand and a pochette in the other, and, although the modern girl is not credited with a superfluity of clothing, sufficient dry garments were forthcoming to send her home dry, but not by the train she intended to catch.

Telegraph Branch Re-Union.—The second Annual Re-Union gathering of the male Telegraph staff took place at the Guildford Hotel, Leeds, on Oct. 24. The Chairman was Mr. C. E. Mulholland, late of the Telegraphs, and he was supported by the Postmaster-Surveyor, Lt.-Col. A. A. Jayne, D.S.O., O.B.E., M.C., and Mr. C. H. Mansell, Chief Superintendent, Telegraphs.

A large number of colleagues on the retired list responded to the invitations and a thoroughly enjoyable evening was spent. After a wholesome repast the Chairman in a witty speech recalled the mannerisms of what he described as "a delightful procession" which he would remember to the end of all time, and evoked much laughter as he recounted the comic deeds of some of the old-time stalwarts.

Col. Jayne expressed his pleasure at being present. He spoke of his long association with the Telegraph Department and of his belief in the adaptability of the telegraph man to many other forms of activity.

Other speakers included Mr. Mansell and Messrs. Whitley, H. Brown, J. T. Parkinson, H. Kendal, G. Barthram, J. Thompson, and J. Pattison.

An interesting and lively musical programme occupied the remainder of the evening.

Leeds Post Office Sports Club.—The Football Team is gradually regaining the position held by them before the war, that of taking all before them as the following results will show:—

Matches played 7, Won 5, Drawn 1, Lost 1.
Goals for, 22; goals against, 11.

A Leeds Civil Service Golfing Society is proposed, and a provisional committee is now arranging an inaugural meeting in the nature of a "smoker."

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LONDON TELEPHONE SERVICE NOTES.

The London Telephonists' Society.—Mrs. Anne Corner's lecture on "Speaking and Voice Production" attracted a large number of members at the second meeting of the current session of the London Telephonists' Society, on Nov. 1.

The subject is of vital interest to the staff of the London Telephone Service, and Mrs. Corner, with her fine sure touch, at once created an atmosphere of warmth and colour which gained and held the interest of her hearers.

It would be impossible in the small space at our disposal to develop to its full extent the theme of the lecture, or to do justice to the depth of knowledge of her subject which Mrs. Corner displayed. The simplicity and clarity of treatment was such that one could not but obtain the greatest possible benefit from the lecture, and one's sensation when listening to the poems, which were so beautifully read, was one of sheer pleasure.

There is no doubt that this feeling far outlasted the span of the lecture, and the thanks given to Mrs. Corner were obviously the sincere appreciation of a very successful meeting, the benefits of which will, no doubt, be reflected in the quality of the Elocution Competition to be held later in the season.

* * * *

Contract Branch Notes.—The business done by the Contract Branch during the month of October resulted in a net gain of 6,461 stations, as compared with 6,587 in October last year. Last year's figures, however, included one order for 472 stations, whereas the biggest order this year did not amount to a third of this figure.

There were 380 exhibitors at the Commercial Motor Show this year and 278 of them, or 73.2%, rented lines. The lines ordered by exhibitors at the Motor Show increased from the 383 given in these notes last month to 387, or 73.7% of the exhibitors.

The number of kiosks in use on Oct. 31 was 1,492, and advice notes were outstanding for a further 108. There were 44 applications for new sites submitted to the Ministry of Transport during the month of October.

Our congratulations to Mr. W. R. Hudson (Clerical Officer in the Western District Office), on obtaining a 1st Class in Telephony (Intermediate) in the last City and Guilds' examination.

* * * *

L.T.S. Bowls.—The annual general meeting of the section was held on Nov. 15, 1929, followed by a supper. The gathering was very representative of the strength of the membership, and much enthusiasm was displayed during the evening at the club's success in winning the Bunbury Cup.

Captain Berry, in moving the toast of the club, remarked on the wonderful progress of the section during a short life of only 3 years, and in a happy speech referred to the history of this noble and ancient game. Mr. G. W. Livermore, who responded, considered that the splendid team work, and excellent support afforded the skips, was mainly responsible for the team's fine record, and concluded by very adroitly drawing a simile of Admiral Drake's famous game on Plymouth Hoe, with the Spanish Armada threatening without, and our team's famous victory against the Admiralty in the final for the Bunbury Cup, in the presence of the First Lord of the Admiralty.

The toast of the visitors was given by Mr. Dickinson, and Mr. Hugh Williams replied. Messrs. H. Williams, J. E. Williams, Captain Berry, Messrs. S. P. Wilson, J. Collins and J. C. Atkins contributed to the evening's enjoyment, and Mr. Bradshaw obliged at the piano. The whole proceedings were excellently controlled by the club's captain, Mr. P. J. Mantle.

* * * *

Football Notes.—The impression obtained at the beginning of the season when watching the team at practice, that the introduction of several new men would materially improve the club's prospects in the league competition, is being fully endorsed by results to date. Up to and including Nov. 9 seven league engagements have been completed, five of which have been won, and the remaining two drawn. Twelve points have been annexed out of a possible 14, and 28 goals have been scored against 10. Futerman has scored 19 of the 28 goals recorded, his shooting being a feature in every match, and the club are distinctly fortunate to find a successor to Cowdrey, who last season was responsible for most of the team's goal-scoring successes. But the most improved part of the team, as compared with other seasons, is the defence, which, apart from the match against Taxes on Oct.5, when 4 goals were yielded, has only been penetrated on 6 occasions in six matches.

If this form is maintained, the club will certainly be concerned with some of the honours to be gained. Such form must be very satisfying to Secretary Evans, who has piloted the team throughout the period since its resurrection a few seasons ago. Since the last results were announced in these columns the following matches have been played :—

Oct. 19.	High Commissioner for India. ...	Draw,	2—2.
„ 26.	War Office	Won,	3—0.
Nov. 2.	Land Registry	Won,	6—0.
„ 9.	Customs	Won,	4—2.

* * * *

L.T.S. Sports Association.—A Social and Dance was held on Friday, Nov. 22, more particularly for the presentation of the Summer Sports Trophies. Owing to the absence of the Controller, who, as it was subsequently ascertained, was rehearsing a B.B.C. surprise item, the President of the Association was represented by Mr. Tinneswood, the recently appointed Assistant Controller on the Accounts side.

As the L.T.S. Bowling Club won the Bunbury Cup this year, the opportunity was taken of inviting Sir Henry to present his own cup as well as the rest of the prizes. The Association were fortunate in securing his co-operation, and Mr. Tinneswood, in introducing Sir Henry Bunbury to the audience, referred to the pleasure it gave him in doing so and assured Sir Henry of the warm welcome the L.T.S. Sports Association extended to him. After giving a brief résumé of the summer activities of the Association, Mr. Tinneswood called upon Sir Henry to present the trophies. Before proceeding with the presentations, Sir Henry expressed the great pleasure it gave him to be present and the honour accorded him in being invited to distribute the sports prizes.

A very appropriate reference to the visit was the analogy of a neighbour visiting the next-door garden, and Sir Henry threw out a hint, which will certainly not be forgotten, that he would like another peep over on some other occasion.

Mr. Hugh Williams, the Sports Association Chairman, in requesting Sir Henry Bunbury to present the Cricket Shield, stated that the first holders were the Accounts Branch, followed in the second year by the Contracts, and this year's winners were the Traffic Branch. A fourth competitor had joined the league this year, consisting of a team of Messengers, and no doubt they had their eyes on this trophy for next year. The Agnes Cox Cup (Lawn Tennis) was the next presentation, and Clerkenwell, the first holders, regained the cup after a hard and well-played struggle with A.R.4, of the Accounts Branch.

A new trophy this year was a Cup presented by Mr. and Mrs. Pink. This was open for competition amongst representatives from any of the exchanges or ladies' office sections. The winner was Miss Wilson, of A.R.1 office section. So valiantly, however, did Miss Parker, of Maryland, fight, under considerable difficulties, for the treasured prize, that Mr. and Mrs. Pink decided to present her with a replica of the Cup.

Mr. Williams then informed Sir Henry that the Swimming side of the Association was such a huge organisation that they had to have an evening to themselves for prize distribution. It consists of 38 clubs, with a membership of over 1,600, a result that Mr. Pounds, the founder, was justly proud of.

The final presentation was the Bunbury Cup. Sir Henry, in handing the trophy to Mr. P. J. Mantle, the bowls captain, congratulated the L.T.S. Bowls Club on their success.

Mr. W. R. Bold, Principal Clerk, Accounts Branch, a very keen supporter of the sports movement in the L.T.S., then proposed a vote of thanks to Sir Henry, which was seconded by Miss Cox, who gave him a very pressing invitation to visit our garden on some future occasion and see how things were going.

* * * *

Temple Bar Swimming Gala.—Bravo, Temple Bar !—The latest Club formed, and yet in their first year arranged a gala. True, it was only in miniature, but the members showed keenness and skill worthy of a more ambitious venture.

The principal races were the one-length handicap, won by Miss Olwen Williams, Miss Morris and Miss Saxton tieing for second place; the one-length open breast stroke, again the winner was Miss Williams, Miss Jones being second; and the walking race. Reference is made to the latter in order to indicate the size of the bath, which is one of the smaller baths at Holborn.

Miss Harlock won this race, and as she also won the learners' race later, described as a "walk over" for the winner, it is evident this competitor is making rapid strides in swimming.

The Supervisors' race was won by Miss Smith in 22 seconds, followed by Miss Richmond, who completed the distance 8 seconds later. "A" side were the winners of the team race, but only beat "B" side by three-fifths of a second. Thread-needle, balloon, egg and spoon, number finding, leap frog, fancy dress and good-night races all contributed to the enjoyment of the spectators and, indeed, to the competitors. Miss Olwen Williams, a promising young swimmer, gave a four-length demonstration of various styles of swimming. Mr. Pounds acted as M.C., and generally supervised the competitions. Miss Clement distributed the prizes at the close of the gala, and congratulated the winners on their success.

* * * *

The Royal Swimming Club.—Under the Presidency of Miss E. R. Johnstone, and with the co-operation of the Monument Club, the annual Swimming Gala was held at Pitfield Street Baths on Thursday, Nov. 14. The Royal Club Championship was won by Miss Brook, Miss Thorby being second. The Monument champion was Miss Medley, and Miss Goodacre gained second place. Miss Philpott won the learners' race, and Miss Wilkins followed 5 seconds later. Other results were: Novices' race, Miss Reece; balloon race, Miss Lidbury; novelty race, Miss Sharp; diving, Miss Lidbury; scratch race, Miss Thorby; handicap, Royal and Monanto, Miss Medley (Monanto). A team race, Telephonists *v.* Engineers, resulted in a win for the latter.

An exhibition of fancy swimming by Misses Coles and Elliott, two professors of the noble art at the baths, was greatly enjoyed. The final event was a polo match between the Engineers and Telephonists. The Engineers won, in spite of their fair (or unfair) opponents having 3 goalkeepers. The weaker side, however, managed to score a goal before the whistle went, by the aid of the referee and one of the Telephonists waiting in the Engineers' goal to receive the throw-in. It was all good fun though, and added much to the enjoyment of the spectators.

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Welcome.

WE—and when I say "we" I am not using the pronoun in the editorial but in the contributorial sense—we are glad to be able to announce that our Editress has returned and we offer her our sincere congratulations upon her recovery. Our feeling of pleasure is such that, once mastering the emotion of the moment—pass me the cambric once more—we want to say with Lewis Carroll

"Then fill up the glasses with treacle and ink,
Or anything else that is pleasant to drink:
Mix sand with the cyder and wool with the wine
And greet Jean McMillan with ninety times nine."

We want to be riotously festive and to fill the column with all sorts of joyous whoops and other happy noises. Wherefore we bought ourselves a mouth-organ—in this case the we is singular (very)—and we practised (again singularly) assiduously in the hope that we might produce sounds which, out of kindness of heart, the Editress might mistake of a pæan. But alas, before we were able to conjure the immortal sounds in their full perfection we were waited upon by a zealous officer of the R.S.P.C.A., who produced a basket and said severely that he had called for the cat and that next time it would mean a summons. So that was that, and we are in consequence instrumentally mute.

I infer from the poem of C. A. S. that in certain quarters the return of the Editress had become a matter of the utmost urgency in order that I might be dealt with according to my deserts. To this austere view I merely say "Pooh." But whether an urgent necessity or not, I consider her return at this juncture to be singularly appropriate, for this is the festive season —or soon will be—of Christmas. This is the season of reunion and of goodwill (and, C. A. S., it is under the goodwill clause that I hope to escape the consequences of my alleged curbless flights). It is particularly appropriate, therefore, that we should be more than ever festive on this occasion. You may not care for a cocktail of treacle and ink, you may prefer your sand without cyder and your wine without a fleecy flavour. If you have any such objections you can follow the advice offered by Mr. Chesterton in relation to another sort of liquid:—

"If an angel out of Heaven
Brings you other things to drink,
Thank him for his kind intention—
Go and pour them down the sink."

But appropriate as is the festivity, it is even more appropriately appropriate to utter the welcome in statistical terms. Think of it—ninety times nine. Can you imagine a more perfect symbol of finality. How could a welcome be expressed to convey better the sense of fulness and completeness? And so we are glad to have her with us again after so long a separation. In the words of that old quotation, so familiar to us all and so very true, "Absence ——"—er, now how does it go—"absence ——"—um, er—ah, I have it, "Absence makes the ribs grow stronger."

PERCY FLAGE.

The Editress Returns Thanks.

A thousand thanks I fain would say
For all the letters, grave and gay,
Which readers very kindly sent
To cheer me in my banishment.
Each day the number larger grew—
Ten, thirty, fifty, ninety-two,
Till, when they'd totalled fourteen score,
I lost all count—yet longed for more.

Then, to beguile the pain-fraught hours,
They sent me flowers and flowers and flowers,
Books, chocolates, scent—and cigarettes
Unsmoked, "the Editress regrets;"
And records too, but not, O joy,
A single one of "Sonny Boy."
Next telegrams with cheery tone,
And kindly words by telephone—
Oh, everything was mine, I'll swear,
Except a greeting "on the air."
And as I stronger grew apace
I longed my colleagues to embrace,
So welcome were their words of cheer
(*Not* male staff—*cela va sans dire*—
Yet, if this ruling they deny,
My lipstick's kiss-proof—so am I).
And now to airy Percy Flage
Whose nimble wit keeps bright this page,
Sub-editor—and loyal friend,
Deep gratitude I gladly send,
His misquotations, too, endorse
(There's nothing else to do, of course).
And so to all I send anew
My warmest thanks—long overdue—
For cheering me in my distress,
My love as well to "C. A. S."
For whom I feel much tenderness,
Yours gratefully, the Editress.

Our Portrait Gallery.

NO. 4.—MISS R. JAMES.

With many other senior telephone women, Miss R. James' experience as a telephonist was gained in the National Telephone Company. In the period of her service with that company she saw several changes in the systems of working commenced and ended. When she transferred to the Post Office in 1902, Central Battery exchanges had been opened, but the system was still only slightly developed. The knowledge she had acquired, however stood her in good stead. The end of 1908 found Miss James in the position of Supervisor-in-Charge at the Victoria Exchange. Only those who remember how quickly that exchange grew and served all the Government Departments,

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can realise how strenuous her period of service there must have been. After the closing of old Victoria Exchange, Miss James was appointed to take charge at Mayfair, the first large ancillary exchange in London. In 1918 Miss James took over the charge of Gerrard, at that time one of the largest exchanges and busiest junction-lending centres in London. There she remains.

A keen and sometimes conflicting realisation of her responsibilities to the Public, the Staff and the Department has generally been apparent in Miss James' handling of official problems, but she has always managed to reconcile the interests affected with satisfaction to herself and those concerned.

Her love of home is strongly reflected in the provision of home comforts which have appeared for the staffs at all the exchanges with which Miss James has been connected. It is, however, in her outside interests that the many-sidedness of Miss James' character is fully shown.

The London Telephonists' Society has benefitted greatly by her consistent support. That her efforts have been successful is revealed by the fact that she is a Past-President and remains an Acting Vice-President, despite many years of service.

The formation of the Gerrard Swimming Club, of which she is President, and which grows in strength yearly, was the beginning of the large Swimming Association formed in the London Telephone Exchanges.

The work originated by Miss James in 1918 for Sidcup Hospital for disabled soldiers and sailors is detailed in the *Telegraph and Telephone Journal* for November, 1929, but the account gives little credit for the resourceful manner in which the monies required were found. Dances, concerts and Sales of Work provided the wherewithal. In no case was failure experienced. Their number was great and showed what organising ability enthusiastically applied can achieve.

Withal, Miss James' hobby and study is humanity and its adaptation to changing conditions. That she is successful there can be no doubt. It is apparent in the affection and esteem she receives everywhere.

Contributions to this column should be addressed: THE EDITRESS, "Talk of Many Things," *Telegraph and Telegraph Journal*, Secretary's Office, G.P.O. (North), London, E.C.1.

LONDON ENGINEERING DISTRICT NOTES.

THE LONDON TELEPHONE SYSTEM.

A NOTABLE ACHIEVEMENT.

THE traffic from certain manual exchanges in the London telephone area will henceforth, during the night period, be routed via the semi-mechanical Tandem Exchange. In other words, the night traffic hitherto dealt with between "A" operators at originating exchanges and "B" operators at incoming, will be passed to the Tandem Exchange. There the operator will key the required exchange and number into a "sender," which will select a junction and transmit the number. At the distant manual exchange this traffic will be received on C.C.I. equipment and it will be unnecessary to staff the manual "B" positions. Should the night operators at originating exchanges depress an order wire key associated with a day-time group of junctions, then a tone will indicate that the traffic should be passed via Tandem.

Ultimately this development may result in a saving of night staff at the incoming exchanges which may more than balance the cost of the increase in staff required at Tandem to dispose of the concentrated load.

The extension of the functions of Tandem as outlined in the foregoing is noteworthy as a practical recognition of its efficiency as a "clearing house" for telephone traffic: otherwise it would be unwise to route night traffic via that exchange.

It is infelicitous that writers and speakers on the London automatic system should so often stress its complexity. Such emphasis tends to produce an unfortunate psychological effect upon subscribers upon whom it would surely be far wiser to urge the simplicity of the system so far as they are concerned. Yet, having in mind the possible faults which may arise from apparatus troubles, from incorrect manual operation at originating, Tandem, or C.C.I. Exchanges, from careless dialling, from faults on external plant, and also not forgetting that these may exist either separately or coincidentally, then a practical recognition of the reliability of the semi-mechanical Tandem Exchange and its associated C.C.I. system is a tribute to those responsible for securing the efficiency of London's telephone network.

The fact that semi-mechanical Tandem has "made good" is due not alone to improved maintenance made possible by mechanical and manual routining. It is also attributable to the exercise of close co-operation between Engineering and Traffic Officers, and to the creation and stimulation of an attitude which compels a vigilant scrutiny of adverse conditions and results in a determination to secure their elimination.

It is the existence of such a spirit, permeating the efforts of those associated with the conversion of London's telephone system, that will secure the highest efficiency.

New Automatic Exchanges.

Name.	*No. of Lines Equipped.*	*Opened.*	*Manufacturer.*
Hendon	4,200	Nov. 23	A.T.M.
Ilford	3,000	Nov. 28	Siemens.

GLASGOW TELEPHONE NOTES.

THE subject of this sketch, like many of her colleagues, had experience of the telephone service before being taken over by the Government.

Miss Margaret Wilson Kay entered the service of the National Telephone Company, Ltd., on June 6, 1892, rising to the position of Clerk in Charge before transfer to the State on Jan. 1, 1912, which service she entered as Assistant Supervisor, Class I.

Miss Kay was in charge of various local exchanges until her promotion to the rank of Supervisor on Mar. 1, 1926, when she was placed in charge of the Glasgow Trunk Exchange, a position of considerable responsibility, for not only is Glasgow the zone Centre for Scotland, but also many of the trunk lines radiating from it are of great length and importance.

MISS M. W. KAY.

Glasgow is the appointed office for a large number of telegrams and phonograms. Not only is the daily traffic heavy, but during the season it is not unusual to handle over 5,000 messages.

It is thus apparent that Miss Kay and her staff of Supervisors have sufficient to occupy their time and energy. It is all to their credit that the services given are very good.

After 37 years of service, Miss Kay still retains her sense of humour and delights in hearing and in telling a good story, therefore she is an acquisition in any social gathering.

Miss Kay is fond of good music, is a lover of the country and delights in a holiday in the wilds of Arran.

On Oct. 17 the schoolroom at South Exchange cast aside its quiet, subdued and sombre look and, as if by some fairy wand, was transformed into a beautiful bower of flowers and palms.

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The occasion was a Whist Drive, arranged by Miss Clark and staff of South Exchange.

The various departments were well represented, as were also the personal friends of the staff. The atmosphere that prevailed during the evening indicated the feeling of good fellowship which exists between the departments at Glasgow.

Mrs. Coombs, in her usual graceful manner, presented the prizes, and a hearty vote of thanks was called for by Mr. Coombs on behalf of the Committee.

The proceeds go to augment the Ex-Service Men's and War Widows' and Orphans' Funds.

Miss Clark, in a short but charming speech, thanked the friends for their support.

It was apparent from the "Smiles in the Voices" that a most enjoyable evening had been spent.

A. W. L.

A very enjoyable evening was spent on Friday, Nov. 1, in Douglas Exchange dining-room, when the staff, numbering about sixty, held a little social in the form of a Hallowe'en party.

The room was transformed, the lights being covered with bright-coloured lanterns which gave out quite a warm glow.

High tea was served at 6.30 p.m., and afterwards the evening was spent in merrymaking. Miss Mortimer, our Supervisor, acted as M.C. Two members of the Test Room staff, Mr. Mellish and Mr. McDougall, who are always very willing to help us, were responsible for a good part of the fun. Songs and readings were rendered by members of the staff.

We were all very sorry that time would not permit us to go on longer and we finished up by singing "Auld Lang Syne."

We thank Mr. Johnson, our Traffic Superintendent, for allowing us the use of the premises on these happy occasions.

A. B. M.

"The Play's the Thing."

(A criticism, with apologies.)

Invitations were issued to the staff in November for repeat performances by the "T.B. Optimists" of the several-years-old but ever-popular play, "The Meetings." The play is well known to us all, the plot, and, indeed, a good part of the play itself, being taken from the "Early History of the Telephonus Serviscus."

As is portrayed in other dramatic productions, in this also we find that human nature alters little, if at all, so that the situations that arose and the difficulties that presented themselves in the "good old days" are still with us in this modern era. But we hope that a solution to all these problems will be forthcoming in the next work from the same author's pen. We await with impatience the production of "The Settlement."

As the scenic effect of "The Meetings" is practically a minus quantity, and there is very little action, the play depends largely on its "lines" for its success. The cast was much the same as on former occasions, and we were glad to welcome "Matheson-Lane" in his accustomed role. At one or two performances there was a slight delay and it was suggested that the play should commence before the hero arrived, but at this there were loud cries of "No! No! Wait till he 'Coombs!'" In order to keep things going "Flotsam and Jetsam"—no, "Tohnson and Jhomson"—gave their splendid turn, bringing in much "Palky" patter. Other curtain-raisers which took almost as well as "The Meetings" itself were "The Hamilton Diggins" and "Brown's Hunter *versus* O'Rourke's Roan," whilst Sir "Kerr Harvey" scored a great success in "Mrs. Reid's Ward." During an interval "Angus Macdonald" was rendered with great feeling, but the staff found this somewhat hard to "enDewar," because it was drama, not opera, they had so eagerly anticipated. Indeed, someone was "Hastie" enough to ask "W'atson" now? but just at that moment the curtain rose.

The audience was requested to participate in the performance, this being one of the peculiar features of the production. Some were enthusiastic and others rather diffident, but on the whole the chorus went with a swing, so to speak. There is much that is real and earnest in the various character roles in "The Meetings" and the drama of life as it is here enacted is full of interest and artistically coloured by the sidelights of humour and pathos.

M. L. TULLOCH.

On Economy and the Acquisitive Impulse.

"Discharging the part of a good economist."—(Terence.)

"Economy is only a transient and monetary twinge of conscience.—(Scott.)

"The acquisitive or hoarding impulse creates a strain of meanness and excessive caution in the character which kills every generous impulse."—(Bligh.)

"The man who cannot and does not save money cannot and will not do anything else worth while."—(Carnegie.)

"I saw that riches are not to men of understanding. . . . There was a little city, and in it a poor wise man, and he by his wisdom delivered the city."—(Ecclesiastes.)

"To the zealous people who wanted to get me a special train to speak with the King, I said that for me a compartment in the usual train was quite enough. Engines and coal should not be wasted. Economise! That is the first and acid test of a true man of Government."—(Mussolini.)

"As an occupation in *declining years*, I declare I think saving is useful, amusing, and not unbecoming. It must be a perpetual amusement. It is a game that can be played by day, by night, at home and abroad, and at which you must win in the long run."—(Thackeray.)

"There is an Italian proverb which says that woman is to money as the sun is to ice. According to my observation, a woman is more naturally disposed to thrift than a man, whenever she is answerable to others for her expenditure. Women who are reckless in spending their own money are scrupulously frugal in spending their husband's. Give a woman the sense of responsibility, and she is more conscientious than a man. A woman will spend half the morning in saving fourpence on her household bills and then make up time by taking a half-crown cab to an appointment. Whereat the man laughs consumedly. This, however, is exactly what man does himself. The man who worries an office to save a pound in business will spend ten pounds without a thought on a dinner at the Savoy. Business is business, says the man; the weekly bills are the weekly bills, says the woman. It is the same habit in both. I know a woman who telegraphed to her husband to buy threepennyworth of cream on his way home from business to save her books from exceeding £6 a week. *He* paid for the cream and the telegram. It was an admirable instinct on her part. Similarly, I have known a Government Department spend £5 of another Department's money to save twopence of its own."—(Bagshot.)

"Have I not seen a public body pass a vote for £30,000 without a word, and then spend three special meetings prolonged into the night over an item of seven shillings for refreshments. . . . Political economy and social economy are amusing intellectual games; but vital economy is the philosopher's stone."—(G. B. S.)

"6/1/1663: This night making an end wholly of Christmas, with a mind fully satisfied with the great pleasures we have had, and I do find my mind so apt to run to its old want of pleasures that it is high time to betake myself to my late vows, which I will to-morrow, God willing, perfect and bind myself to, under pain of forfeiture, that so I may for a great while abstain from plays, and wine, and other unnecessary expense, and do my duty, as I have well begun, and increase my good name and esteem in the world, and get money, which sweetens all things, and whereof I have much need. . . ."

"18/1/1663: To my office, perfecting my vows again for the next year, which I have now done, and sworn to in the presence of Almighty God to observe upon the respective penalties thereto annexed. . . ."

"23/2/1663: Thence to the theatre, and in the midst of the two plays, I was sad to think of the spending of so much money and venturing upon the breach of my vow, which I found myself sorry for, though my nature would well be contented to follow the pleasure still. But I did make payment of my forfeiture presently."—(Pepys.)

FOR OUR ADVERTISERS.

The following extracts are open until dates stated, and all references should be made to the Department of Overseas Trade, London, S.W.1:—

Melbourne.—P.M.G. requires following three items Dec. 17. Secondary batteries (Schedule C. 505) (Ref. B.X. 5777). Telephone fuses, heat-coils and protectors (Schedule C. 498) (Ref. B.X. 5784). Loading-coil pots (Schedule C. 499) (Ref. B.X. 5785). *Pretoria* P. and T. Dept. Dec. 27. Supply telegraph material, including galvanised iron tubular arms, insulators, upper tubes for 24 ft. poles, bases, and screw rings, rods for stays, crossheads, and stay plates. (A.X. 8734.) *Melbourne* P.M.G. Jan. 7. Supply of timing clocks (Schedule C. 507) (Ref. B.X. 5762). Also same date, supply of testing instruments (Schedule C. 504) (Ref. B.X. 5786). Also same date and department, supply of (1) contact pressure testers and (2) telephone hand sets (B.X. 5821 and 5823). *Wellington*, N.Z., P. and T. Dept. Jan. 13. Supply of four-point jacks (B.X. 5840). *Melbourne* P. and T. Dept. Jan. 14. Supply of (1) telephone indicators and (2) ringing motor generator sets for automatic telephone exchanges (B.X. 5822 and 5839). *Wellington*, N.Z., Government Railways. Jan. 15. Supply of automatic telephone equipment for new station at Auckland (B.X. 5841). *Wellington*, N.Z., P. and T. Dept. Same date. Supply of galvanised iron bolts (B.X. 5818). *Melbourne.* State Electricity Commission of Victoria. Feb. 10. Supply of sine wave-generating equipment and accessories (B.X. 5844), *also* Mar. 30, supply of D.C. neutral relays for power signalling purposes (contract No. 43457) (Ref. B.X. 5793).

J. J. T.

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A BRIEF CHRONOLOGY FOR STUDENTS OF TELEGRAPHS, TELEPHONES AND POSTS.

BY HARRY G. SELLARS.

(*Continued from page* 40.)

1889, June 1 ... Dane Sinclair and H. F. Jackson patented a horizontal multiple telephone switchboard.

1889, June 4 ... Postmaster-General, H. Cecil Raikes, urged to establish and maintain a telephone system.

Wiedemann experimented at Wolfenbuettel in the photo-electric power of sunlight and diffused daylight.

Svante Arrhenius theorised in connexion with atmospheric electricity.

J. A. Barrett and W. D. Sargent, of Brooklyn, used paper as a covering for cable wires.

1889, July 15 ... W. Deckert, of Austria, patented a granular carbon telephone transmitter with a carbon diaphragm screened with gauze.

Ericcson also devised a granular transmitter.

Parment, of France, devised an automatic method of Hughes working in which he suggested simultaneous printing and reperforation at the receiving end, the reperforated tape to be used for any necessary retransmission.

Baudot multiplexed the Hughes telegraph printer.

Electric omnibus tried in the streets of London.

1889, Sept. 2 ... Issue of Inland Telegraph Money Orders commenced with 17 largest towns.

1889, Nov. ... Insurance up to £50 for parcels to India arranged at a fee of 6*d*. for each £5.

James Prescott Joule died.

Antonio Meucci died.

Submarine Telegraph Company's concessions expired and Post Office took over their cables at a cost of £67,163.

Halifax-Bermuda Cable Company received subsidies (£8,500 per annum for 20 years) from the British Government for a cable between Halifax and Bermuda.

British Post Office Savings Bank deposits, £62,999,620.

1890, Mar. 1 ... Edinburgh Chamber of Commerce addressed memorials to the Treasury and the Postmaster-General, advocating purchase of the telephone system by the Government.

Inland Telegraph Money Order system extended to all head and branch Post Offices in the United Kingdom.

International Telegraph Conference held in Paris.

J. E. Kingsbury patented a common-battery system of telephone signalling.

A. Eden, of the British Post Office, devised a system of "Loop" testing for telegraph lines and introduced the Post Office morning test of telegraph lines.

F. H. Pomeroy introduced a method of testing telegraphic "earths" and devised the "earth" test for localising faults on telegraph lines.

Sir William Preece, Matthew Cooper, and A. J. Stubbs, succeeded in raising Wheatstone automatic telegraph speed to 600 w.p.m.

T. Vallance, of France, suggested a method of working the Baudot by means of perforated tape.

Ferranti constructed current transformers capable of reducing voltages ranging from 2,000 to 10,000.

Hughes duplex telegraph opened between London and Bremen.

(Battaglia invented a mechanical means of meeting submarine cable capacity difficulties when working Hughes.

Nikola Tesla suggested wireless control of the motions of a boat from the shore or from another boat. He produced a 1-kw. alternator for wireless working for 10,000 cycles a second.

Dewar constructed a capillary electrometer. He also showed that an electric current is set up in the optic nerve when light falls upon the retina.

Lodge devised a wireless receiver consisting of two long copper rods which acted as wave collectors.

Robinson designed an "electric harp" composed of parallel strips of tinfoil affixed to a plate of glass, the ends of the strips at each end of the plate being joined by a strip of tinfoil. The strips were severed diagonally so that the lengths varied and, owing to their consequent varying capacities, the "harp" responded to vibrations extending over a considerable range of wavelengths.

R. Threlfall, of Sydney, experimented in wireless telegraphy.

(*To be continued.*)

THE ST. MARTIN'S SWIMMING CLUB'S GALA NIGHT.

THE Holborn Baths, W.C.1, was well attended on the evening of Oct. 28 last—it was the St. Martin's Swimming Club's (Secretary's Office) Gala Night. Among those present were Mr. Kidner, Mr. Belgrave, Mr. Strong (President of the A.G.D. Swimming Club) and Mrs. Strong, and Mr. Napier.

The programme was opened by the 30 yds. Ladies' Handicap Race (two heats). The 1st heat was won by Miss Burgin (42⅘ secs.), and the 2nd heat by Miss Mortimer (39⅘ secs.); the final of the handicap was swum later in the evening and was won by Miss Mortimer, who has a strong breast stroke.

There were three entrants for the 30 yds. Veterans' Race—Messrs. E. G. Hayman, A. J. Harris and S. Moore; E. G. Hayman won. The 30 yds. Ladies' Free-Style Championship was won by Miss Sarsfield. B. M. Reeves is to be congratulated on the manner in which he gained the lead and won after "Going at 9" in the Boy Messenger Handicap Race. The three heats of the 30 yds. Club Handicap were won by Messrs. S. A. Manser, W. Hawkes and G. W. Adlam, respectively. The last-mentioned later won the final, beating S. A. Manser by a fraction of a second.

The Type Duty team again were successful in the 30 yds. Ladies' Breast-Stroke Team Race, although at times it appeared that the Registry team were too strong for them.

The teams of the Secretary's Office, S.B.D., and A.G.D. each strove keenly to be the holders of the Sir Herbert Samuel Cup. However, after a while it was obvious that the S.B.D. team were to be the victors. The Secretary's Office team secured second place.

From the start it was apparent that the Admiralty team were intent upon victory in the 90 yds. Team Race (Premier Civil Service League), but their opponents—the P.O. Engineers—showed themselves to be the faster team. The P.O. Engineers are a comparatively new club, having been formed only three years ago; nevertheless, for the last two years they have been the holders of the Civil Service Championship.

The 1st place in the 60 yds. Ladies' Race (30 yds. breast stroke and 30 yds. back stroke) was won by Miss Clarke.

Professor Jarvis (ex-Amateur Champion of the World) provided an interesting item by giving exhibitions of floating, propelling in the water &c. Realistic were his emulations of "a seal," "a monkey up a stick" and "a torpedo."

The Telegraphs and Telephones wrested the 1st place from last year's holders—the Mails—in the Inter-Branch Team Championship.

The "Doride" (A.G.D.) were successful in the 30 yds. Ladies' Team Race, beating their opponents, the Secretary's Office, by nearly thirteen seconds.

Intense interest was shown by all present during the exhibition of diving by a team from the Amateur Diving Association.

Some good swimming was witnessed during the 30 yds. Club Handicap Team Race, which was won by the Mails Branch.

During the evening two Water Polo matches were played, one between Ilford and S.B.D., and the other between the P.O. Engineers and the Admiralty. The lack of team play during the first match was at times noticeable, and a more interesting game might have been seen had not some of the players attempted to play a "lone game." The second match provided the onlookers with more thrills, and some clever passing was witnessed on both sides. (Ilford 8, S.B.D. 3; Admiralty 5, L.E.D. 1.)

Wild conjectures were rife during the evening, when a certain young gentleman swimmer wandered aimlessly among the spectators with a white pull-over over his costume and an American sailor's hat resting at a rakish angle on the top of his head. Was he a member of a new cult? Perhaps a member of the Dress Reform Movement. Such were the ideas lent by the imaginative people present as to his classification—however, it was mentioned "*sotto voce*" that he was the Cost of Living Figure. We wonder.

Mrs. Hoare kindly consented to present the prizes.

Winter Swimming.—The Club is running a Winter Swimming Course under the tuition of Professor Jarvis, and applications to participate are invited. Particulars of this course, and of the conditions of membership of the Club, will be furnished by the Secretary, F. J. C. Hoare, Overseas Telegraph Branch, Secretary's Office, G.P.O.

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THE

Telegraph and Telephone Journal.

VOL. XVI. JANUARY, 1930. No. 178.

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Subscription: To the public, 5s. 0d. per annum, including postage. To the Staff, 3s., including free delivery to any Post, Telegraph, or Telephone Office. Single Copies: To the Public, 4d. each, or post free 5d. To the Staff, 3d. each. Orders should be sent to the Managing Editor, TELEGRAPH AND TELEPHONE JOURNAL, *G.P.O. North, London, E.C.1.*

All correspondence relating to advertisements should be addressed to MESSRS. SELLS, LTD., 168, *Fleet Street, London, E.C.4.*

The Editing Committee of the Telegraph and Telephone Journal wish all their readers a Happy and Prosperous New Year.

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THE TELEPRINTER.

A. P. OGILVIE (*Headquarters Traffic Section*).

(*Continued from page* 42.)

(II.)

"*Start-stop*" *Principle.*—The synchronous movement of transmitter and receiver is a fundamental principle of many successful printing telegraph systems. In the Baudot, for example, continuously rotating brushes which sweep over the segmented plates of a distributor at each station are maintained in unison by means of correcting signals. An interruption of these special signals, or a sudden abnormal variation in the speed of one or other of the distributors, results in the loss of synchronism, and all dependent traffic channels, eight in number in the case of a quadruple duplex installation, are rendered unworkable until synchronism is restored.

While the action of the Teleprinter is also based on the synchronous principle, there is an important difference. In the Baudot system the transmitting and receiving brushes rotate continuously. Any difference in speed between the distributors is therefore cumulative over a period of several revolutions and there is continuous change within limits in the phase relationship between the two distributors. In Teleprinter working the distributors, or their equivalent, do not rotate continuously but only throughout the process of transmitting one letter. This is arranged by prefixing to each letter a "start" signal, which brings into action the receiver at the distant station, and by transmitting after each letter a "stop" signal which stops the receiver. Synchronism need thus be maintained during one cycle of operations only, at the end of which both transmitter and receiver remain inoperative until transmission is resumed. It will be apparent from these considerations that the maintenance of synchronism between Teleprinters is comparatively simple provided a reasonably steady drive is applied at both stations, and that, as speed differences are corrected by the return of the mechanism to zero after the transmission of each letter, a fairly wide margin of variation is permissible. Moreover, in the event of momentary interruptions only those signals transmitted during the period of disturbance will be affected; immediately the abnormal condition ceases synchronism is restored by the action of the start-stop correction. It should, perhaps, be mentioned that the term "start-stop" does not apply to the action of the small motor fitted to these machines for the driving of the mechanism. This motor, in Post Office practice, runs continuously, whether telegrams are being signalled or not.

Signalling Code.—The design and action of telegraph printing apparatus is largely determined by the code or alphabet employed. Many promising systems have failed because of an elaborate and variable unit code involving the use of complicated mechanism, and it is interesting to record, in this connexion, that the Morkrum "Teletype," in its earliest form, was handicapped by the use of a similar complication. The adoption of a five-unit code led to considerable simplification in design, and subsequent success. In this code five positive and/or negative impulses are allotted to each character. In contrast to the morse code, which consists of signals of varying lengths, a combination of uniform length is always transmitted, a point of considerable importance to the designer. As may be gathered from Figure 1, the permutations are so arranged that the signalling of frequently-used letters entails a minimum amount of movement of the mechanism.

The code illustrated is based on an arrangement promulgated by Mr. Donald Murray, whose object was to provide one suitable for typewriter keyboard transmission also in accord with the letter frequency of the English language. Thirty-two permutations are available, each of which serves as a medium for the transmission of two characters, one on the "letter shift" and one on the "figure shift." Thus, for the letter "E" and the numeral "3," the

		1	2	3	4	5			1	2	3	4	5
A	:	O	O				Q	1	O	O	O		O
B	?	O			O	O	R	4		O		O	
C	(		O	O	O		S	'	O		O		
D	²	O			O		T	5					O
E	3	O					U	7	O	O	O		
F	½	O		O	O		V	)		O	O	O	O
G	¾		O		O	O	W	2	O	O			O
H	⅝			O		O	X	£	O		O	O	O
I	8		O	O			Y	6	O		O		O
J	⅞	O	O		O		Z	.	O				O
K	%	O	O	O	O		/	/		O			
L			O			O	⅓	⅔	O	O	O	O	O
M	▼			O	O	O	−	=				O	
N	−			O	O			+		O			O
O	9				O	O	LETTERS				O		
P	0		O	O		O	FIGURES		O	O		O	O

SIGNALLING CODE

FIG. 1.

same combination is transmitted, arrangements being made at the printing stage for its correct translation according to whether it is preceded by the letter or figure shift signal.

While five units are sufficient for the transmission of each letter or symbol, the start-stop action of the Teleprinter requires a preliminary start signal, 1½ units in length, and a final stop signal, 1 unit in length. The Teleprinter code, therefore, is one of 7½ units. This is shorter than the morse code, which averages 8 units per letter. A slightly higher speed should thus be possible with a start-stop system on a circuit of a given transmission capacity, or, stated in other terms, a Teleprinter working at 60 words a minute should provide more signal margin than is obtained with a morse system working at a similar speed.

Keyboard Layout.—The arrangement of the British Post Office standard type-keyboard, including an outline of the fingering adopted in touch-typing, is shown at Figure 2.

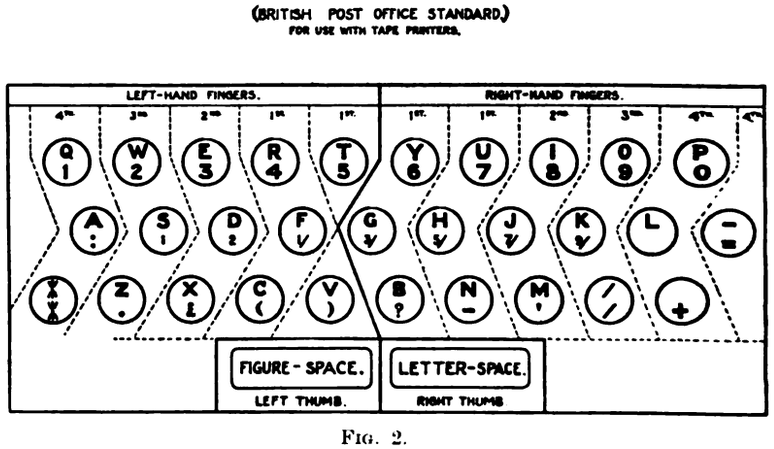

FIG. 2.

Conventional typewriter practice is followed in the disposition of letters and numerals but certain of the secondary characters are distinctive. On the centre keys in the middle bank several numerators are provided to facilitate the transmission of fractions most commonly in use. The denominator is produced by printing

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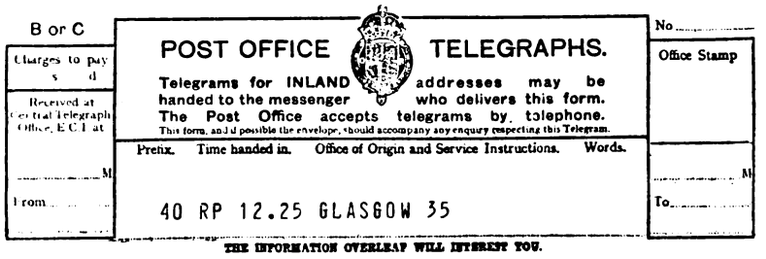
an appropriate numeral immediately after the combined numerator and oblique stroke. By this means a considerable range of fractions can be expressed in fractional form with a minimum amount of signalling. The symbol on the key at the extreme left of the bottom bank is used to indicate an "erasure," while that on the extreme right is operated for the "end of message" signal.

A specimen telegram constructed to include practically all the characters on the British Post Office keyboard is shown at Fig. 3. The use of the symbol for the break between the address and text, the appearance of fractions transmitted in fractional form, and the termination signal, are illustrated. It should, perhaps, be explained that inverted commas are produced by transmitting the apostrophe twice in succession.


B or C

POST OFFICE TELEGRAPHS.

Telegrams for INLAND addresses may be handed to the messenger who delivers this form. The Post Office accepts telegrams by telephone.

This form, and if possible the envelope, should accompany any enquiry respecting this Telegram.

Charges to pay s d

Received at Central Telegraph Office, E.C.1 at ... M

From ...

No. ...

Office Stamp

Prefix. Time handed in. Office of Origin and Service Instructions. Words.

40 RP 12.25 GLASGOW 35

... M

To ...

THE INFORMATION OVERLEAF WILL INTEREST YOU.

-RP- JONES C/O FICTITIOUS LONDON -

SEND QUICKLY 35⅞ FEET (PINEWOOD) 79½ FEET EACH FOLLOWING THICKNESS ¾ 5/16 2/32 ALSO 40 FEET OF 5/16 15/16 9/10 PRICE NOT TO EXCEED £12/6/ DESPATCH BY STEAMER '' MARGUERITE '' -

VIZMAN +

FIG. 3.

A departure from typewriter design is the provision of two space bars. The function of these space bars is two-fold. Not only do they provide the spacing between words or groups, they also determine whether the characters to be printed shall be those on the letter-shift or the figure-shift. To transmit the sentence "Send 123 tons" the space bars would be operated as follow :—

(Letter-space) SEND (figure-space) 123 (letter-space) TONS.

Much operating time and movement is saved by this device. It is also of advantage in limiting the effect of an inversion fault at the printing stage. When successive figure groups are being transmitted, intervening spaces are produced by the figure-space signal and, as this signal at the same time moves the printing mechanism from letters to figures, a fault of reversion of the shift mechanism to letters is corrected when the next figure-space signal is received.

One weakness, in practice the only one, is that of spacing between constituent parts of a word or group in which a character on the opposite shift occurs. For example, in the sentence "IS MARY'S BABY WELL?" the apostrophe and the mark of interrogation are on the figure-shift. The sentence is produced thus: "IS MARY ' S BABY WELL ?" Fortunately, examples of this nature are infrequent.

From an operating point of view the Post Office keyboard, with double space bar, and only three banks of keys, is more easily mastered than one with a greater number and a wider range of keys. "Touch" operators are taught to work from base keys on the centre bank and, as may be seen from the keyboard diagram, each finger is restricted to an area within which only short simple movements are necessary to reach the required key; a high degree of manipulative accuracy is thereby ensured. Both space bars are worked with equal facility. Excellent results are being obtained by Teleprinter operators, many of them over 40 years of age, trained on this system.

(To be continued.)

TELEPHONE DEVELOPMENT OF THE WORLD AT 31ST DECEMBER, 1928.

BY W. H. GUNSTON.

ABOUT 1,740,000 telephones have been added to the total for the world between the end of 1927 and the end of 1928; if the figure of increase for 1928 has been maintained, it may be estimated that there were at least thirty-four and a quarter million telephones in use at the end of 1929. There are indications, however, that the total will be found to be considerably higher when the figures are available. The totals for 1928 and 1929 are distributed amongst continents as follows :—

	Dec. 31, 1927. (*Thousands.*)	Dec. 31, 1928. (*Thousands.*)
Europe	8,541	9,185
Asia	1,103.5	1,205
Africa	187.5	205
N. America	19,979	20,885.5
S. America	463	491.5
Australasia and Oceania	630	672
	30,904	32,644

The figures for Asia and America for 1927 have been slightly adjusted in the light of later information, since last year's figures were presented to our readers (see *Journal* of January, 1929).

Europe shows an increase of 644,000 (much the largest yet recorded) or 7.5% on the previous year, whilst North America shows an increase of over 906,000 telephones or 4.5% on last year. The rates of increase for 1927 over the previous year for the two countries were 6.4% and 4% respectively.

In the eight years since 1920 Europe's total has increased by about 4 million telephones or 77%, and North America by over 6½ million or 46%.

The following table shows the number of telephones per 100 inhabitants in all countries with upwards of 100,000 telephones and a density of at least 2% :—

1.—United States	16.5
2.—Canada	13.77
3.—New Zealand	10.3
4.—Denmark	9.2
5.—Sweden	7.9
6.—Australia	7.8
7.—Norway	6.5
8.—Switzerland	5.9
9.—Germany	4.7
10.—Great Britain	3.9
11.—Netherlands	3.3
12.—Finland	3.2
13.—Austria	3.1
14.—Belgium	2.9
15.—Argentina	2.4
16.—France	2.3

EUROPE.

The annexed table (I) shows that there is one telephone to every 56 inhabitants of Europe. This average is, however, very adversely affected by the comparatively backward development of Eastern and Southern States. If an area comprised within the boundaries of the Scandinavian countries, Germany, Austria, Switzerland, France, Holland, Belgium, and Great Britain be considered separately, it will be found that this Northern and Western part of Europe contains within its limits 7,648 of the 9,185 thousand telephones in Europe, but only 191 out of its 514 million inhabitants, a ratio of 1 telephone to every 25 souls.

The principal increases in growth occurred in Germany 135,434 (nearly 5%), Great Britain 125,884 (7.6%), France 82,113 (9.3%), Austria 43,855 (27%), Russia 39,324 (15%), Belgium 29,311 (15%),

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Switzerland 20,651 (9.2%), Italy 20,414 (7.5%), Sweden 18,994 (4%), Holland 16,979 (7%), Poland 13,642 (9%), Spain 11,400 (8%), and Czecho-Slovakia 10,513 (7%).

On Dec. 31, 1928, the telephone system of Great Britain consisted of :—

	Telephones.
Post Office system	1,723,307
Hull Municipal	15,720
States of Guernsey	4,226
States of Jersey	3,319
Railway and private telephones with exchange facilities	13,114
	1,759,686

I.—EUROPE.

Country.	*Population (thousands).*	No. of Telephones. *Dec.*31,1927.	*Dec.*31,1928.	*No. of Inhabs. per telephone.*
Austria	6,750	165,615	209,470	32
Belgium	7,995	193,755	223,066	34.9
Bulgaria	5,483	15,359	17,091	322
Czecho-Slovakia ...	14,353	136,614	147,127	97
Danzig	390	17,620	18,405	21
Denmark	3,519	319,554	325,596	10.8
Esthonia	1,250	13,209	14,000*	89
Finland	3,582	108,000	116,720	30
France	40,743	883,406	965,519	42.2
Germany	63,100	2,814,996	2,950,430	21.4
Great Britain	45,500	1,633,802	1,759,686	25.8
Greece	7,000	8,000	10,186	686
Hungary	8,522	88,961	93,159	91
Iceland	94	3,811	4,925	19
Irish Free State ...	2,975	26,579	27,000*	110
Italy	40,425	272,433 (to 30/6/27)	300,000*a*	134
Latvia	1,883	29,165	33,390	56
Lithuania	2,000	10,236	11,281	185
Luxemburg	264	9,394	10,000*	26
Netherlands	7,731	240,611	257,590	30
Norway	2,788	178,000	182,500*b*	15.3
Poland	29,589	149,968	163,610	180
Portugal	6,032	26,626	29,517	204
Roumania	17,000	56,024	58,398	291
Russia	146,989	253,490 (to 30 9 27)	300,000*c*	490
Serbs, Croats and Slovenes, Kingdom of	12,800	32,801	40,000*	320
Spain	22,285	142,000	153,400	146
Sweden	6,105	466,787	485,781	12.6
Switzerland	4,035	223,597	244,248	16.5
Turkey	2,000	11,389	11,927	167
Total, including estimates for the Saar District, Gibraltar, &c.) ...	514,300†	8,541,000	9,185,000*d*	56

* Estimated from previous year's official figures.

† Estimated population of Europe in 1926 from League of Nations Yearbook.

a—Estimated from the official total at June 30 1928; 292,867.

b—The official information obtained from Norway showed 106,121 State telephones at June 30, 1928, and 75,004 private company telephones at Dec. 31, 1927. The total for December, 1928, has been estimated from these figures.

c—Estimated from official figure of 292,814 telephones at Sept. 30, 1928.

d—Includes telephones in Russia in Asia, probably upwards of 12,000.

II.—ASIA.

	Telephones.
Ceylon (8,383)	9,000*
China	130,000†
French Indo-China (6,143) ...	7,000*
Federated Malay States	6,711
India (51,925)	53,689
Iraq (1,087)	1,134
Japan (proper)	834,686
Chosen (33,952)	35,500*
Formosa (Taiwan) (12,852)...	13,600*
Quantung (18,100)	18,500*
Saghalien (4,531)	5,000*
Netherlands East Indies (45,762)	49,398
Palestine (2,945)	3,299
Persia (3,449)	3,827
Phillipine Islands (19,874) ...	20,000
Siam	3,065
Straits Settlements— Penang 1,443 Malacca 609 Singapore 7,152	9,194
Turkey in Asia (estimated) ...	2,000
	1,205,000

* Estimated from last year's official figures (shown in brackets).

† An American estimate.

This total is exclusive of some 15,000 telephones in Siberia and Turkestan which are included in the European total under Russia.

The population of Asia is about 1,013,000,000 and the number of inhabitants per telephone 840.

III.—AFRICA.

Countries.	*No. of Telephones.*
Algeria (28,305)	31,021
Belgian Congo (886)	900*
Dar es Salaam	615
Egypt (39,054)	41,000*
Kenya and Uganda (2,131) ...	•2,358
Mauritius	784
Madagascar (1,548)	1,600*
Morocco (8,729)	8,700*
Mozambique	660
Nigeria and Cameroons	2,041
S. Rhodesia (2,741)	3,275
South Africa, Union of (88,880)	95,452
S.W. Africa	1,395
Tunis (10,680)	11,500*
Other places (estimated)	3,500
	205,000

* Estimated from last year's official statistics.

The figures in brackets show the number of telephones in 1927. Population 143,000,000. Inhabitants per telephone 704.

IV.—NORTH AMERICA.

	Population (thousands).	*Telephones* 1927.	*Telephones* 1928.	*Inhabs. per telephone.*
United States	117,200	18,523,500	19,341,035	6.6
Canada	9,738	1,265,869	1,341,219	7.2
Mexico	15,500	64,916	70,000	221
West Indies—				
Cuba	3,500	68,838	71,000	49
Porto Rico	1,300	13,222	13,500	96
Jamaica	—	—	2,900	—
Haiti	—	—	1,400	—
Dominican Republic ...	—	—	1,600	—
Trinidad	—	—	2,700	—
Other places	—	—	9,200	—
Central America	6,500	22,511	24,000	270
Other N. America places ...	—	—	8,000	—
	158,060	19,979,000	20,885,500	7.5

The figures in brackets show the number of telephones in 1927. Those for Mexico, the West Indies, and Central America are obtained from an American source.

The total of the United States is made up as follows :—

American Telephone and Telegraph Co. and associated companies	14,524,648
Independent Companies having connexion with above	4,672,387
Entirely Independent (estimated)	144,000
	19,341,035

An increase on 1927 of 817,500 or 4.4%.

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Canada.—Telephones are thus distributed amongst the provinces of the Dominion :—

	Telephones.
Ontario	592,071
Quebec	281,266
British Columbia	116,508
Saskatchewan	112,178
Alberta	78,805
Manitoba	77,619
Nova Scotia	43,368
New Brunswick	32,605

The increase in stations for the year was over 75,000 or 6% on last year.

V.—SOUTH AMERICA.

	Population (thousands).	*Telephones.*	*Inhabitants per telephone.*
Argentine (232,041) ...	10,312	250,000	41
Bolivia (2,612)	—	3,000	—
Brazil (108,189) ...	36,871	111,000	332
Chile (38,573)	4,750	40,500	117
Colombia (21,110) ...	8,057	23,000	349
Ecuador (4,407) ...	—	5,000	—
Peru (13,695)	6,000	14,000	427
Venezuela (13,098) ...	3,027	14,000	216
Uruguay (26,934) ...	1,720	28,000	61
Other places	—	3,000	—
	77,791	491,500	158

The statistics for South America are obtained by estimates based on the official figures for 1927 which are shown in brackets.

VI.—AUSTRALASIA.

	Population (thousands).	*Telephones.*	*Inhabitants per telephone.*
Australia (461,715) ...	6,336	492,666	12.8
New Zealand (144,552)	1,470	152,541	9.6
Hawaii (21,441) ...	256	23,500	11.0
Other places in Oceania	700	3,000	—
	8,700	672,000	13

Australia.—The telephones are thus distributed amongst the various States :—

New South Wales	188,320
Victoria	152,205
Queensland	58,865
South Australia	52,890
Western Australia	26,653
Tasmania	13,733

The percentage increase on last year for the Commonwealth was 6.5.

VII.—TELEPHONE DEVELOPMENT OF LARGE CITIES.

	Telephones.	% 100 *Population.*
1.—New York	1,702,889	27
2.—Chicago	942,015	29
3.—London (Telephone area) ...	614,183	8.3
(*London Administrative County*	459,136	10.2)
4.—Berlin	472,018	11.7
5.—Boston	424,781	23.3
6.—Philadelphia	420,456	20.6
7.—Los Angeles	357,504	26.7
8.—Paris	340,207	11.9
9.—Detroit	321,439	19.1
10.—San Francisco	252,225	33.6
11.—Cleveland	226,186	19.9
12.—St. Louis	213,041	19.5
13.—Pittsburg	215,125	22.4
14.—Toronto	186,215	27.5
15.—Montreal	174,062	18.9
16.—Hamburg	163,276	12.9
17.—Cincinnati	161,019	23.7
18.—Washington	154,041	29.3
19.—Milwaukee	146,677	21.7
20.—Kansas City	143,846	22.6
21.—Vienna	140,759	7.6
22.—Tokio	135,619	5.8
23.—Copenhagen	131,363	22.1
24.—Buenos Aires (1927)	129,503	6.4
25.—Baltimore	128,587	15.8
26.—Minneapolis	126,888	25.8
27.—Buffalo	123,832	19.2
28.—Oakland, Cal.	120,921	23.6
29.—Stockholm	120,432	29
30.—Seattle, Wash.	117,681	28.6
31.—Sydney, N.S.W.	110,847	10

CITIES WITH UPWARDS OF 10,000 TELEPHONES.

United States :—(The largest of these are included in the foregoing table)	157
Germany :—(Berlin 472,018, Hamburg 163,276, Munich 69,725, Leipzig 66,124, Cologne 64,858, Dresden 58,440, Frankfurt (Main) 56,298, Stuttgart 43,878, Düsseldorf 42,379, Breslau 40,501, Hanover 35,288, Nuremberg 34,476, Bremen 31,049, Essen, Mannheim, Chemnitz, Duisburg, Königsberg, Magdeburg, Dortmund, over 20,000 ; Stettin, Elberfield, Halle, over 15,000, Barmen Kassel, M. Gladbach, Karlsruhe, Crefeld, Wiesbaden, Aachen, Kiel, Brunswick, Erfurt, Mainz over 10,000)	34
Great Britain :—(London 614,183, Manchester 57,329, Liverpool 53,308, Glasgow 52,249, Birmingham 45,898, Edinburgh 25,187, Leeds 19,729, Newcastle-on-Tyne and Sheffield over 17,000, Bradford, Bristol over 16,000, Hull 15,720, Belfast, Cardiff, Nottingham, Leicester, Brighton, and Bournemouth 13-10,000)	18
Canada :—(Toronto 186,215, Montreal 174,002, Vancouver 70,133, Winnipeg 50,068, Ottawa 36,295, Hamilton, Quebec, Windsor (Ont.), and Calgary over 20,000, London (Ontario), Victoria (B.C.) and Edmonton, over 16,000, Halifax (N.S.), St. John (New Brunswick), and Regina over 10,000)	15
France :—(Paris 340,207, Lyon 23,928, Marseille 22,579, Bordeaux 14,524, Lille 12,957, Strasbourg 12,406, Nice 11,150)	7
Japan :—(Tokio 135,619, Osaka 93,218, Kyoto 32,745, Nagoya 26,975, Kobe 27,303, Yokohama 14,035)	6
Australia :—(Sydney 110,847, Melbourne 90,736, Adelaide 31,134, Brisbane 23,225, Perth 15,176)	5
Switzerland :—(Zurich 33,892, Basle 18,789, Geneva 18,699, Berne 15,567)	4
Italy :—(Milan 30,659, Rome 21,617, Turin 13,649, Genoa 11,812) ...	4
Netherlands :—(Amsterdam 44,449, Rotterdam 38,097, The Hague 35,985)	3
Belgium :—(Brussels 75,174, Antwerp 31,173, Liége 15,423) ...	3
Sweden :—(Stockholm 120,432, Göteborg 33,089, Mälmo 16,658)	3
New Zealand :—(Auckland 17,460, Wellington 17,167, Christchurch 11,188)	3
China :—(Pekin 29,857, Shanghai 27,217)	2
Egypt (1927) :—(Cairo 15,555, Alexandria 11,125)	2
India :—(Calcutta 15,557, Bombay 11,722)	2
Norway :—(Oslo 43,667, Bergen 10,114)	2
Spain :—(Madrid 29,362, Barcelona 25,130)	2
South Africa :—(Johannesburg 25,841, Cape Town 15,919) ...	2
Russia :—(Moscow 66,542, Leningrad 54,755)	2
	276

Algeria :—(Algiers 10,142)	1
Argentine (1927) :—(Buenos Aires 199,503)	1
Austria :—(Vienna 140,759)	1
Brazil :—(Rio de Janeiro 40,000)	1
Chile :—(Santiago 11,000)	1
Czecho-Slovakia :—(Prague 34,171)	1
Cuba (1927) :—(Havana 46,998)	1
Danzig :—(Danzig 11,184)	1
Denmark :—(Copenhagen and suburbs 134,475)	1
Finland :—(Helsingfors 29,235)	1
Hungary :—(Budapest 39,154)	1
Ireland :—(Dublin 15,000)	1
Latvia :—(Riga 13,180)	1
Mexico :—(Mexico City 36,000)	1
Poland :—(Warsaw 38,814)	1
Portugal :—(Lisbon 17,893)	1
Roumania :—(Bucarest 16,355)	1
Turkey :—(Constantinople 11,927)	1
Phillipine Islands :—(Manila 13,586)	1
Uruguay :—(Monte Video 17,000)	1
	296

Of these 298 cities 174 are in North America, 24 in Europe, 11 in Asia, 8 in Australasia, 3 in Africa, and 4 in South America.

It will be seen that there are 63 cities in the world with upwards of 50,000 telephones—36 in the United States, 7 in Germany, 4 each in Great Britain and Canada, 2 each in Russia, Australia and Japan, and 1 each in France, Belgium, Austria, Sweden, Denmark, and Argentine.

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CORRESPONDENCE.

HOW TO IMPROVE THE TELEGRAPH SERVICE.

TO THE EDITOR OF "THE TELEGRAPH AND TELEPHONE JOURNAL."

SIR,—The recent articles on "How to Improve the Telegraph Service," and the recommendations of the "Commission of Enquiry into the Organisation and Methods of the American Telegraph Companies," have been read with widespread interest and have formed the subject of many discussions wherever a few individuals of a "telegraph" turn of mind have congregated. There is a large amount of useful information and much food for thought in the articles and the recommendations of the Committee. One writer doubts whether the service can be made to pay, another suggests that a better service at the same cost would satisfy the public, whilst a third infers that any increase in the number of telegrams handled would only result in a heavier annual deficit. Surely the conditions are not so depressing that the *ideal of an excellent service and a smaller adverse balance* can be abandoned without using every legitimate means to attain it? According to the recommendations it is proposed to install teleprinter apparatus on all circuits carrying as many as 200 telegrams per day. Presumably that is the minimum load to justify such apparatus from an economical point of view, but the maximum carrying capacity will be considerably higher, so that there will be an ample margin for future development without any immediate increase in capital outlay so far as equipment is concerned. May we not then assume that the average loss per telegram will tend to fall so soon as an all-round improvement of the service encourages the public to load up the new equipment to the full capacity? With Unity of Purpose, Goodwill, "Professional Pride" and Enthusiasm, I can visualise a future in which the public will use the facilities afforded them to such an extent as to prove conclusively that the telegraph service must still play an important part in the commercial and social life of the community, the staff will see their prospects for advancement brighter than they have ever been before, and the administration will find themselves in the happy position of being able to offer greater facilities without increased charges.

The recommendation to install teleprinter apparatus on routes carrying 200 or more telegrams per day will bring into the scheme a large number of the smaller head offices at which, under the existing arrangements, the telegraph duties are performed in turn by dually qualified officers, and it appears to be the intention to limit the rotation on such duties in the future to a minimum. That is an excellent arrangement, and so long as the training for both operating and testing, maintenance, &c., is thorough and the number of officers so trained is sufficient to provide a margin for normal absences the service on these secondary routes should compare favourably with that on routes between the large centres. I would, however, suggest that consideration be given to the advisability of linking up groups of smaller offices for sick leave and vacancy substitution so far as the "technical" staff is concerned, and that a "district reserve force" be provided at convenient large centres for this purpose on the lines of the arrangements now in force in the Telephone Service. Another item that occurs to me is that if telegraph and postal work is to be performed by separate staffs at offices where the former class of work is not sufficient to justify separate supervising posts there will either be an entire absence of prospects for the telegraph staff or else they must be considered for promotion on the postal side. The latter alternative would necessitate periodic performance of postal duties to ensure proficiency in that class of work. Such an arrangement would neutralise to a certain extent the value of the "specialisation" advocated for telegraph work and would probably involve additional expense for the training of officers who would only be withdrawn from postal duties at infrequent intervals. As an alternative I suggest that the telegraph "technical" staff at such offices should rank for seniority and promotion purposes with the staff at the centres at which the "district leave" reserves would be stationed.

I have often wondered whether the possibilities of transmitting telegrams by telephone have ever been fully explored, or whether the existing low output per operator per hour has acted as a deterrent. The bulk of this class of traffic at the present time is to and from telephone subscribers and sub-post offices at which the standard of operating is not always high. Another factor contributing to the low output is the high percentage of single message transactions. During breakdowns of telegraphic communication I have seen operators dispose of as many as 32 telegrams per hour, which inclines one to the belief that transmission by telephone *between expert operators* can be made to play an important part in the general reorganisation by enabling the administration to suspend those Morse circuits over which less than 200 telegrams per day are transmitted, with a consequent reduction in the number of offices at which it will be necessary to have Morse operators. May I suggest (if data is not already available) that an experiment be made at certain offices in order that the costs of transmission by Morse telegraph and telephone under the above-mentioned conditions may be compared. I do not wish to infer that the speed of working quoted could, or should be maintained for lengthy periods, but the suggested experiment would, no doubt, prove that a much higher standard than the present one could be fixed for this class of traffic.

According to the statement of one of the writers the cost of delivering telegrams is unduly high, and various suggestions are made by different writers with the object of reducing the loss under this heading and also of expediting delivery. Whilst I do not advocate any increase in the cost to the sender of a telegram I do think that the heavy fees paid for delivery in rural areas should be borne by the addressee, and for that reason I suggest that consideration be given to the classification of telegrams under three headings *for delivery purposes only, viz.*:—

(1) Free delivery by telephone (the use of the indicator "Phone" or a telephonic address to be used as at present);

(2) Free delivery by hand within a radius of one mile of the normal delivery office, and

(3) Express delivery fees of 6*d*. per mile to be charged to the addressee for each mile or part of a mile in excess of one.

It appears to be the general opinion that the delivery of telegrams by telephone to subscribers should be developed to the greatest possible extent, and as this can only be done by publicity I would suggest the following:—

(1) Prominent notices to be displayed in all post offices calling special attention to the facilities. (The notices should take the form of enlarged telegram "A" and "B" or "C" forms, showing model addresses with the subject matter of the notice in the text.)

(2) "Accepting" officers to ask the senders of telegrams if they wish the messages to be delivered by telephone, and then offer to assist them to remodel the addresses. (In the case of fully addressed telegrams it would be possible in many instances to show the senders that, apart from expediting delivery, they would save the cost of one or more words.)

(3) Scrutinise the sub-office "C" forms for one week and (*a*) ascertain the number of telegrams delivered by hand which could have been dictated per telephone direct to the addressees; then, if necessary, improve the arrangements for segregation at the responsible head offices; (*b*) Prepare lists showing the names and addresses of non-telephone subscribers who received (say) 2 or more telegrams during the week and pass to the Telephone Contract Managers for them to try and persuade such persons to rent a telephone. The canvassing officer could stress the fact that telegrams would be delivered *direct* to the addressee from the "appointed office" and that any telegrams for onward transmission could be dictated to the same office, with an appreciable saving in time in both cases. If delivery fees were payable by addressees whose premises were more than a mile from the normal delivery office, as suggested in the previous paragraph, the saving of those fees would be a further inducement to them to become telephone subscribers.

There is a recommendation by the Committee that a subscriber should be afforded the facility of summoning a messenger by telephone to collect a telegram, and I would suggest that in those cases where the office from which the messenger would be summoned was also the "appointed office" the subscriber should be allowed to ask for that messenger to deliver to him any confirmatory copies of telegrams on hand. He would then be able to confirm the accuracy of his copy of a particular message before handing the reply to the messenger.

R. TEASDALE.

Sheffield, Dec. 6, 1929.

THE POST OFFICE ENGINEER.

TO THE EDITOR OF "THE TELEGRAPH AND TELEPHONE JOURNAL."

SIR,—May I express a word of appreciation for the inspiring article by Mr. T. B. Johnson, M.I.E.E., which appeared in the October issue of the *Journal*.

In one telephone exchange at least it has been read and enjoyed by every member of the Supervising staff, all of whom unite in wishing him a healthful and happy retirement.—U. J. C.

FOR OUR ADVERTISERS.

The following contracts are open until dates stated and all references should be made to the Department of Overseas Trade, London, S.W.1:—

Wellington, N.Z.—Post and Telegraph Department. Jan. 16. Plug covers for telephone switchboard plugs (P. and T. 151/1943) (Ref. B.X. 5879). *Wellington, N.Z.*, P. and T. Dept. Jan. 21. Supply of (1) spare parts for automatic telephones and (2) reed-type tension gauges for measuring contact pressure of relay springs (B.X. 5917 and 5918). *Melbourne* P. and T. Dept. Jan. 28. Supply of (1) induction coils and register plates, and (2) telephone cycle signalling equipment (B.X. 5899 and 5906).

J. J. T.

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TELEGRAPHIC MEMORABILIA.

I AM writing these new year notes in the declining old year, full of its accounts of record rainfalls and record river risings, and all the cruel aftermath which follows such abnormal happenings in our island, not omitting the placing out of action of some hundred or so of telegraph and telephone circuits. The writer disclaims membership of any society connected with piscatorial pastimes, and it must have been his own subconscious wandering self which led his eyes down the weekly angling column of a very old-established London daily paper.

Hitherto I had consoled myself, during the daily and nightly deluges, with the assurances of the Water Board that there was no danger of further drought and that my garden-hose could again be placed on active service! Yet in an unexpected quarter I was to find yet another consolation, and, for what it may be worth as a compensatory factor, I pass the same on for the consideration of every Post Office engineer specifically attached or related to outdoor telegraph and telephone maintenance. The expert writer and follower of Izaak Walton, angler and philosopher, directed the attention of his readers to the fact that although angling had certainly been interfered with, the floods had very materially enlarged the feeding grounds of the river fish, owing to the number of meadows now under water, and that sport should be much improved when the waters had subsided! As who would say, "what matter telegraph and telephones and other interrupted methods of communication, ground-bait will now be plentiful!"

Multum in parvo.—National Radio Week commences on the 12th of this month, and it is understood that the B.B.C. is spending double the normal amount on special programmes. *Beware of radio wolves in sheep's clothing!*—A band of very plausible swindlers recently concentrated in the villages of North and East France and sold scores of worthless wireless sets to the villagers. The day after the sale an *electrician* chanced (?) to pass through the same villages, and offered to adjust the sets for a small fee. This fee was readily paid. The police are still searching for the electrician and his pioneers! *Radio and Photographs.*—Major R. H. Ranger, Design Engineer of R.C.A. Communications, on returning from an observation tour in Europe, reported "striking progress made there in the transmission of photographs by radio." *Teletype Manufacturing figures in U.S.A.*—Teletype Corporation gives the following figures up to end of 1929 (the last quarter estimated): 1918 to 1927, 15,500 machines made; 1928, 12,700 made; and for year just closed, 25,200; grand total 53,400. *France and Broadcasting.*—The French correspondent of the *Daily Telegraph* in Paris notified London that the French Government proposes to spend £40,000 in utilising radio for the distribution of weather reports and daily prices to farmers. The same authority states that there are loud complaints against the quantity and quality of the programmes. *Coast-to-Coast Wireless.*—A transcontinental wireless circuit was inaugurated between New York and San Francisco by the Mackay interests on Nov. 15. *Rent, one shilling per year!*—This is the rent to be paid for the fixing of an aerial to trees in Enfield Town Park, London.

General Information.—ALGIERS.—The Governor-General of Algeria, North Africa, opened a high-power broadcasting station at Arba, near Algiers, on Nov. 19. AUSTRIA: *High-frequency and broadcasting.*—The police of Klagenfurt have issued an order, says *World Radio*, forbidding the use of H.F. massage apparatus, X-ray apparatus, and anything similar which may impede wireless broadcasting between 7 p.m. and midnight, unless urgently necessary for the sick, and then only upon the doctor's responsibility. BRAZIL.—Rio de Janeiro states that the work on the installation of radio-telegraph stations is commencing at Fernando-de-Noronha (destined to become the most important air-port in Brazil), Natal, Recifé (Pernambuco), Maceao, Bahia, Caracellas, Victoria, Rio de Janeiro, Santos, Florianopolis, Pelotas, and Puerto Alegre. CANADA.—A programme of 25 national broadcasts, to be given this winter over the new Atlantic to Pacific wireless "chain," has been arranged by the Canadian National Railways. Stretching from Halifax, N.S., to Vancouver, approximately 15,000 miles of land wire will be used and 16 actual stations. No less than five different time-zones are covered! DENMARK.—Listeners' licences taken out during the period from Dec. 15, 1929, to Mar. 31, 1930, will be reduced to 5 kroner for the remainder of the year. HOLLAND.—The Catholic Radio Society and the Netherlands Christian Radio Society have applied for permission to erect a number of local stations for relaying the Huizen programmes. The Gleichwellen system will be used. GERMANY.—At the beginning of October last there were 2,843,569 radio receiving licences in Germany, approximating to the figures for Great Britain recently announced by the P.M.G., viz., 2,869,000.

Financial.—According to the financial editor of the *Electrical Review*, upon the completion of the purchase of the Indo-European Telegraph Company's system by Imperial & International Communications, Ltd., £27,000 is to be divided between the following four directors upon their retirement from the board, as compensation, viz.: Mr. H. L. M. Tritton, Sir Rayner C. Barker, Mr. F. J. Brown, and Mr. C. H. Tritton. In the case of the managing director (Mr. Axel W. Berg), the sum of £30,000 is to be placed in trust for payment to him upon loss of office, unless he is offered or accepts other employment with the company or the Communication Company. Compensation will also be paid to any others of the British and foreign staffs who are displaced as a result of the purchase.

The deceased Mr. J. C. D. Jones, formerly E.-in-C. to the Eastern Telegraph Co., Ltd. at Singapore, left £47,307 net and £47,587 gross personalty.

The P.O. T. and T. Society of London.—Two especially interesting lectures were given on Nov. 18 and Dec. 16 respectively by Mr. F. Addey, B.Sc., F.R.A.S., M.I.E.E., on "Wireless Aids to Navigation," and by Mr. S. A. Pollock, O.B.E., on the "Work of the Research Section of the E.-in-C.'s Office." Both were well attended and both were illustrated by excellent slides. One cannot but envy the ease and self-possession with which Mr. Addey lectures on whatever subject he may choose to select, and no matter the *venue* or the status of his audience.

Mr. Pollock's lecture was illustrated by a couple of films, being, we were given to understand, the first effort of the Research Section to make and install the same, a by no means easy task, but one which this Section will undoubtedly make an unimpeachable success before long, one may confidently prophesy. Mr. Pollock received the unanimous congratulations for what to most of his listeners must have been a revelation of hitherto unknown Post Office activities, and sincerest expressions of thanks for the special personal obstacles surmounted in order to keep his engagement.

Cost-Accounting and a late C.T.O. Chief.—Looking through the most recent list of text-books recommended by the Institute of Costs and Works Accountants for students preparing for the Institute's examinations, it was sadly interesting to note that under the heading of "General Commercial Knowledge and Office Organisation" two out of the three publications mentioned were the work of the lamented Mr. John Lee—viz., his "Management" and the "Dictionary of Industrial Administration," the latter probably his *magnum opus*.

Diaries and Christmas Cards.—Many thanks for the personal seasonal greetings the writer has received from well-wishers of the *T. and T. Journal*. Prominent among these may be mentioned the very handy diary from Messrs. Creed & Co., finished in that perfect style inseparable from their high standard; also the "AMERICARISTMAS and a HAPPY NEW YORK" from the Supervising Officers and Telegraphers of the F. Division, C.T.O., which with its jazz cover and its ebullition of high spirits belie some at least of its artistically expressed pen and ink drawings. H. H. J. has again to be congratulated, The truth of the text: "A FORD CAR is no better than a ROLLS-ROYCE in a blocked thoroughfare" cannot of course be gainsaid!

Conscience.—"Conscience is harder than our enemies,
Knows more; accuses with more nicety."
—"The Spanish Gypsy."—*George Eliot.*

J. J. T.

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THE "LAG": ITS CAUSE AND ITS CURE.

THERE is one desire which is shared by all who are engaged in the telephone industry and that is to see such an expansion of the service in this country as will put it on a footing closely comparable with that of the U.S.A. and one or two other densely telephoned countries. In face of this desire the question naturally arises as to the causes which contribute to keep back telephone development, and in considering this question it has occurred to me that a very useful purpose might be served if I be allowed to set out what appears to me to be necessary for the consummation of this common desire.

It is, I suppose, impossible to have absolutely ideal conditions in any sphere and one has to be satisfied with those which are reasonably good, and in the consideration of the question already referred to, I would suggest that certain reasonably good conditions should obtain. These conditions fall under three headings :— (1) publicity, (2) plant, (3) prosperity ; and a consideration of the last two named need not take up much time or space. As regards plant, the Department has, with credit to itself, remedied the shortage brought about by the terrible war period, and it remains for those who are responsible for forecasting the probable growth of the system in the different Exchange areas to have sufficient vision to prevent a shortage of plant in any locality, but at the same time not to have such magnified vision as will result in too much plant being laid down.

As to the third condition, it is, I suggest, evident that the state of trade or the general prosperity of the country has a very material effect upon the growth of the system. For example, the Hatry collapse, followed by the Wall Street debacle, most obviously resulted in a falling off in the number of new orders. As this condition is entirely outside the control of the telephone administration, no advantage will accrue from a further consideration of it.

Before passing to a consideration of the principal condition it would perhaps be advantageous to make some general remarks as to the position in London as regards development, and in the first instance to point out that in no less than 40 out of the 125 Exchange areas comprised in the London Telephone area, we are either in advance of the forecasted figures for the present date, or less than six months behind them. It seems to be a matter of impossibility to ascertain why in these areas there should be in such considerable measure a realisation of our forecasted figures, whereas in other areas where the class of property is almost identical, where the amenities are as good, and where the forecast has been made on the same lines, yet our achievement at the present time is below our anticipation, in other words there is what is known as a 'lag.' It would appear to indicate that in some districts there is a fuller appreciation of the advantages of the telephone service than in others. Another feature calling for comment is the fact that in some residential areas, development is coming more rapidly from houses of a medium value rather than from the higher priced ones. It would almost seem from this, that in these days, when practically all house-buying is done with the help of a mortgage, many people who have bought more expensive houses find that to keep up the necessary payments is as a millstone round the neck, and they allege they cannot afford the telephone. So many luxuries can now be obtained on the hire payment system that people are tempted to acquire that which they cannot really afford, and having to keep up the periodical payments in respect of what they are so purchasing, are very reluctant to increase their expenses even if it be for such a necessity as the telephone.

It is interesting, too, that experience shows that, other things being equal, the occupant of a post-war house is more likely to become a subscriber to the telephone system than one who lives in a residence built before the war. Another point to be noted is that people living in neighbourhoods where travelling facilities are comparatively inadequate, are less anxious to rent telephones than they are in places where the means of transit are ample. It might also be mentioned that it has recently been computed and stated in the public press that upwards of 600,000 families of the two million families in Greater London are able to enjoy a moderate degree of luxury. On the other hand, there are scarcely more than 160,000 residential lines rented in this area. This comparison indicates one vast field that exists for the expansion of the service.

Passing now to the specific consideration of the publicity problem it should, in the first place, be pointed out that efforts are being made by an association of manufacturers to bring before the public the advantages of the telephone system, but something more than this is necessary. It is one thing to be cognizant of advantages to be derived from the possession of something, but what is really necessary is to create in the public mind a very real sense that the telephone system is not merely something which brings certain advantages, but that it is something that cannot be done without and which brings its own economy in the saving of time and temper, money, and worry. We cannot create the need. It is there ; but we should create the sense of that need. Considerations of policy, which cannot well be discussed in a paper of this sort, are involved, but there are certain aspects of the matter over which we may well ponder. In the first place, is each member of the telephone staff of the Department doing his or her share ? Each one of us, however humble our official position, must know someone to whom the telephone service is a vital necessity but who is not connected. If each member of our London staff influenced one new subscriber a quarter for one year, our growth would be more than doubled.

What relatively small numbers of suburban shopkeepers are alive to the advantages of having the telephone connected to their places of business, and what a field there is here for education. It is an astonishing fact, however, that what is true of the man of the small business in the suburban areas, is also true, although not to the same extent, of shop-keepers in the well-known shopping thoroughfares of the great Metropolis. Even in the principal streets, most are inadequately equipped with Exchange service, and there are actually some entirely without it, the reason being that they are very imperfectly educated as to the advantages available to both themselves and their customers ; they must be instructed as to its vital necessity in their own interests. In this connexion it can be pointed out with significance that the two great countries which are effectively challenging and overtaking the eminence in trade of this country, show a greater density of telephones in their commercial centres than we do. The question may well be asked as to whether we lag behind because of the all too prevalent lethargic idea that business will roll into our laps without effort, without publicity.

As regards the residential areas, whilst it is true that in certain districts a reasonable proportion of the houses is connected, yet in the majority of the suburbs, even in the case of those inhabited by what are known as the upper middle classes, it is astounding to walk down road after road and find that so many of the houses are still without telephone service. The owners thereof need to be educated, but their instruction should not be on the same lines as that of the business man. It is the housewife who rules in suburbia, and to teach her, the lesson must be on different lines to that given in business quarters. The good angler varies his bait to catch the different sorts of fish.

As already indicated, it is evident that the public, generally speaking, need educating as to the service, its cost, the facilities it affords, and what is of great importance as an offset to the gibes of certain pressmen, as to its reliability.

There are various ways in which this education or publicity can be carried on, by propaganda, by advertising, by circularising, or by canvassing.

By propaganda I mean the publication in the press of informative articles concerning the service, and to enable this branch of the publicity work to be effective, it is highly desirable

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that the articles should be of such sort as will grip the reader and be of fair frequency, and not published at rare and irregular intervals.

If advertising be employed as a means of reaching the public, it seems desirable that the advertisements whilst retaining dignity should be telling and should not follow stereotyped lines. Circulars, too, should be such as will catch the eye, impress the mind, and so influence the recipient that he will be convinced of the necessity of his becoming a subscriber to the telephone system.

Whether or not publicity is carried on by any, or all, of the means just indicated, it will still be necessary to have a sufficient number of contract officers—as the Post Office calls its telephone canvassing staff—to push home the effect produced on the mind by such publicity (or alternatively produce that effect) to gather in the resultant orders, and to get in touch with the large numbers of people who by lack of observation or otherwise failed to observe, or to be influenced, by the article, advertisement, or circular as the case may be. It may be assumed, I think, that if circumstances compel a person to rent a telephone circuit he will take the initiative and write to the Department, but to get at the man who has not as yet realised how vital it is in his own interests to become a subscriber to the system, persistent and intelligent canvassing is highly necessary. Spasmodic effort in the way of canvassing quickly loses its effect and is not therefore profitable; what is necessary to ensure the proper growth of the system is prolonged, persistent, and systematic effort. For example, the great emporia whose names are household words instead of, as formerly, having annual or half-yearly sales, seem to be having sale times practically all the year round, thus keeping themselves constantly in the public eye.

To reach the heads of all the business concerns in this great Metropolis who are still without the benefits of the service, those of the 600,000 families already referred to who are not connected, and the vast number of householders outside this number to whom telephone service is a necessity but who do not realize it, would mean the employment of a very much greater effort in the way of publicity in one or all of the forms indicated. Such effort will, of course, cost money, and the return produced might not at once be commensurate with the expenditure involved but would, I am sure, be more than justified by future results.

There is a considerable volume of development, too, to be expected from existing subscribers, and it is highly essential that some means be found for finding busy subscribers on automatic exchanges and persuading them to rent the additional circuits required to carry their traffic, and so obviate loss of business to themselves, inconvenience to their clients, and loss of revenue to the Department.

Other suggestions could be made as to reaching the public, for example, the utilisation of each of the Exchange premises in London as an Information Bureau, for it is to my mind abundantly clear that if the service is to grow as it should grow the public must be reached.

W. G.

RETIREMENT OF MR. COWIE.

ON NOV. 20 a large assembly gathered to say farewell to Mr. J. Cowie, Executive Engineer of the West Internal Section, on the occasion of his retirement.

Mr. Gomersall made the presentation on behalf of the staff and other friends, and spoke of the high esteem in which Mr. Cowie was held both on account of his work as an engineer and his personal character.

Tributes were also paid by representatives of various grades to Mr. Cowie's unfailing courtesy, kindness, and good humour. Mr. Cowie set a high standard of service for himself and possessed in a remarkable degree the power of infusing others with his own ideals. He did not drive but he let men see what he expected from them and what he believed they could do. He made them believe it also and as a result he obtained what he desired.

Mr. Cowie lives at Brighton and it is hoped that he will have many happy and useful years to devote to the social work which he has now taken up.

A C.T.O. PENSIONER AND THE COCOS ISLANDS.

POSSIBLY not half of the present C.T.O. staff have any recollection of Mr. S. F. Pace, formerly Asst. Superintendent in the Inland department, and who last autumn made a round-the-world health tour via New Zealand. Mr. Pace has still the comrade spirit of the craft within him despite his advancing years, and in response to a notice on board the outgoing vessel, he sent a letter of greetings to the Eastern Telegraph Extension Company's staff on Direction Island, one of the Cocos group.

This message was thrown overboard in a barrel, with other articles, including fresh meat, newspapers, &c., for the officials and others stationed there, as the liner passed the Cocos Islands.

Mr. Pace thought no more of the matter, but since his return to England—much improved in health, one is glad to say—he has received a most interesting acknowledgment from one of the resident staff, giving a short account of life on this isolated cable repeater station.

"There are eighteen of us at present," writes Mr. Pace's informant, "for the staff has been gradually reduced from a maximum of 31 since the introduction of the Regenerator method of working the cables. Prior to this innovation the maximum number of cables that could be relay-linked was two, and that only with reduced speed and doubtful signals. Nowadays London is in absolutely direct telegraphic communication with Singapore, Capetown, Bombay, &c.

"Our little island is about ¾-mile long and 200 yards at its widest part and is crescent shaped. Its highest point is only about 6 feet above high-water mark, so if there was anything like a tidal wave we should be washed away!

"A fair amount of tennis is played on our two hard courts. Sailing boat races are held every month, but, naturally, the number of boats has decreased with the dwindled staff.

"A library of 2,500 books, which is continually being supplemented, and a billiard room, further enables us to pass away our leisure hours, but at the present moment most of the operators are studying hard in their endeavours to satisfy the examiners in a rather stiff exam. which is now in force.

"The chief drawback is the lack of fresh meat and vegetables, and we think ourselves fortunate when a cask floats in from a ship and we can taste good beef and/or mutton.

"We grow tomatoes, lettuces, and beans with a great deal of trouble owing to the very poor quality of the soil, mostly coral sand, while the rats and vermin are always a nuisance. We have to get fresh earth from Singapore frequently, as the earth is washed into the sand by the rains. We raise pigs and fowls, so get other fresh meat occasionally. The only natives here are our servants, mostly Chinese.

"We don't know how the amalgamation of the cables and wireless is going to affect the staffs in the future, but I suppose no drastic changes will take place in the conditions for a long while. We all hope that the retiring age (55 years) will be reduced to 50, as at present very few of the men live very long after retirement, probably due to the change of climate.

"There are no married ladies here, which I think is a blessing in a small community! I remember when I called in at Christmas Island, near Java, on my way down here last time, there were three women and none would speak to another!"

These latter were neither telegraphists or telephonists, it is interesting to note!

J. J. T.

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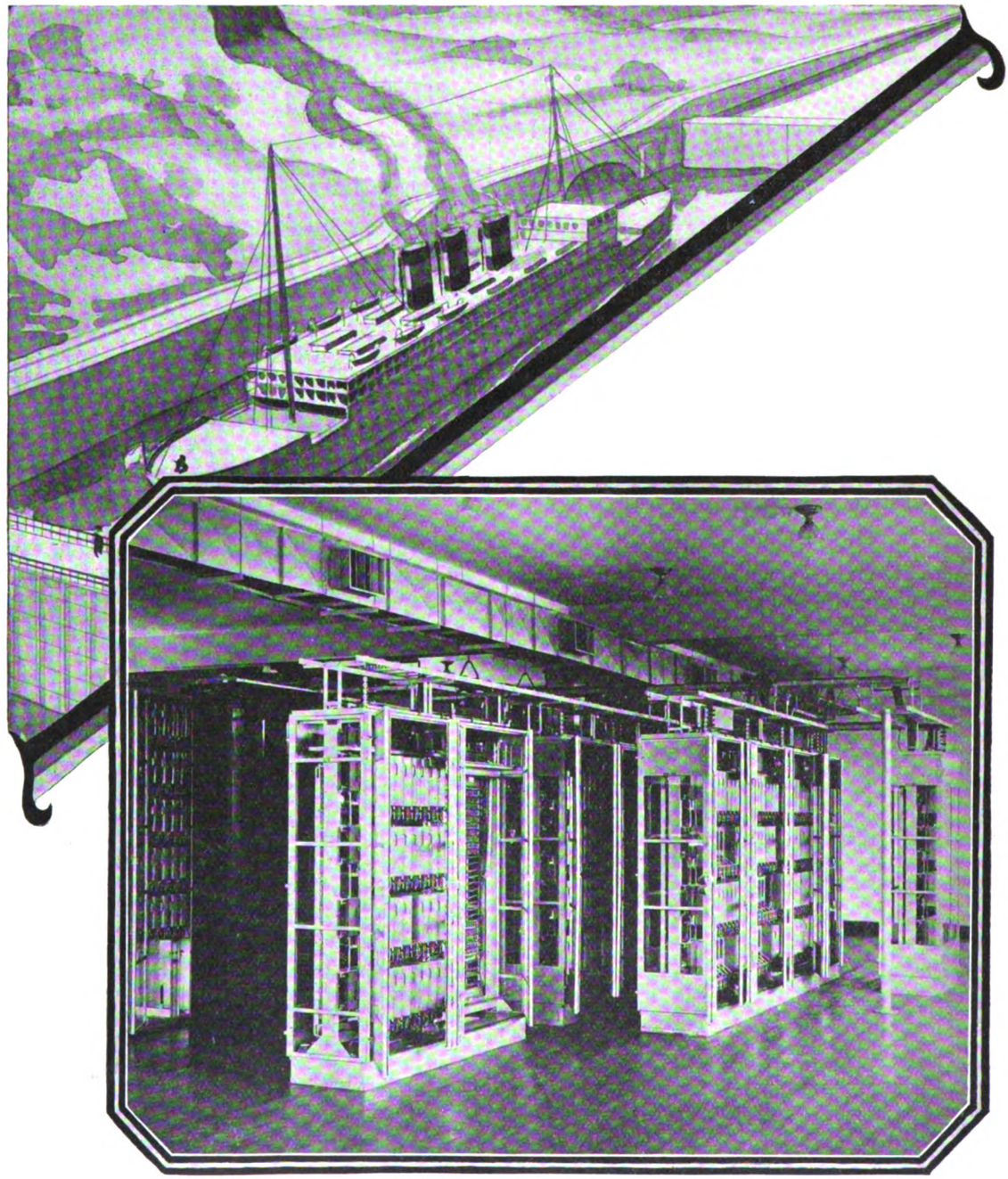

Strowger Automatic equipment in the Cristobal Office, Panama Canal Zone. To prevent the destructive operations of tropical insects, all wooden parts such as bases, piers, cabinets, etc., are made of either mahogany or rosewood, both of which are virtually insect-proof.

STROWGER

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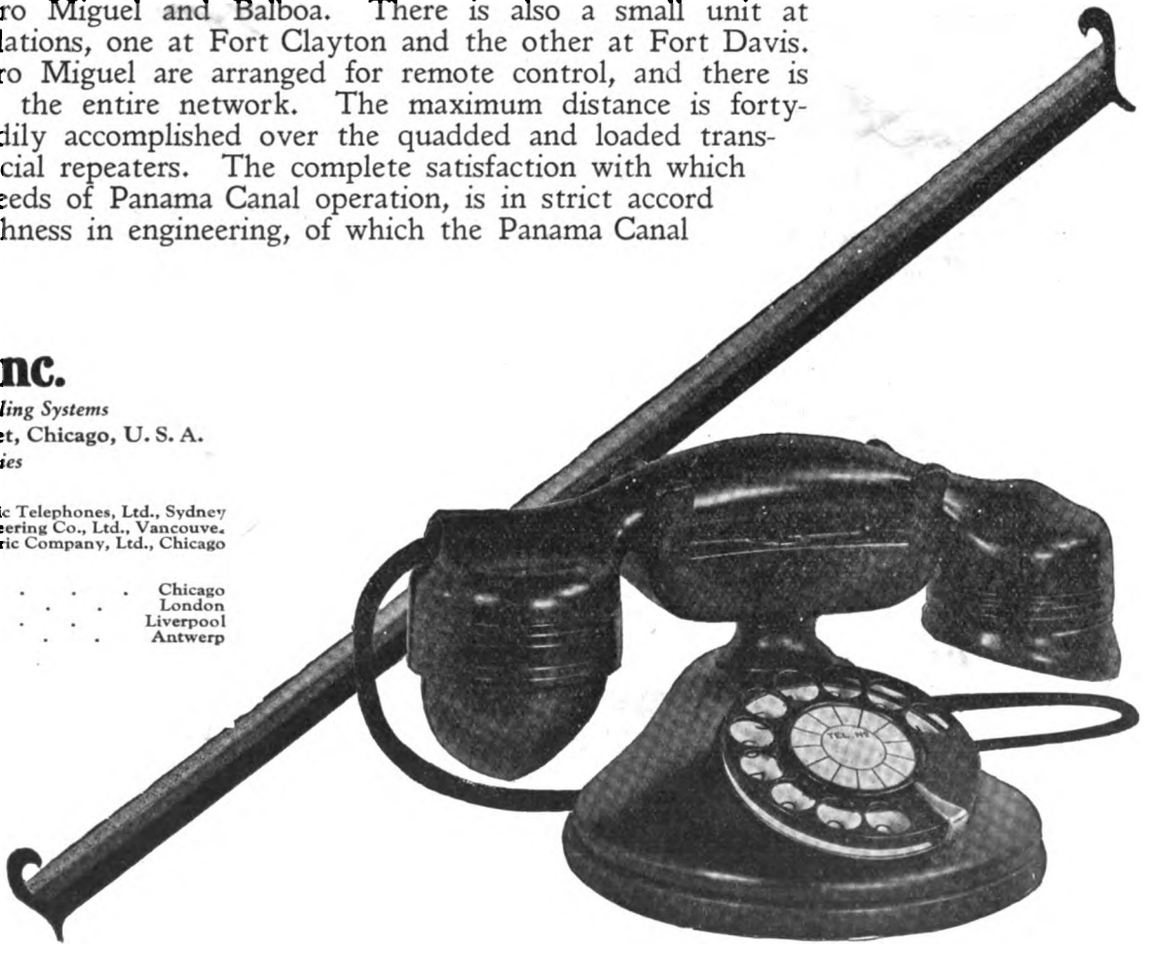
ama Canal Telephone
em Is Strowger Automatic

ry, 1926, the entire telephone system of the Panama Canal Zone was cut
o Strowger Automatic operation. The system was selected after thorough
on by officials and engineers of the Panama Canal Commission, as being the
nt of efficiency and trouble-proof dependability, and as exemplifying the
ndards in its design, construction and operation.

ity of the network is approximately 3,000 lines distributed among four main
ristobal, Gatun, Pedro Miguel and Balboa. There is also a small unit at
nd two P-A-X installations, one at Fort Clayton and the other at Fort Davis.
s of Gatun and Pedro Miguel are arranged for remote control, and there is
d dialing throughout the entire network. The maximum distance is forty-
s, and dialing is readily accomplished over the quadded and loaded trans-
able by means of special repeaters. The complete satisfaction with which
n meets the severe needs of Panama Canal operation, is in strict accord
rican ideas of thoroughness in engineering, of which the Panama Canal
e highest expression.



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The
Telegraph and Telephone Journal.

PUBLISHED MONTHLY IN THE INTERESTS OF THE TELEGRAPH AND TELEPHONE SERVICE, UNDER THE PATRONAGE OF THE POSTMASTER-GENERAL.

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NOTICES.

As the object of the JOURNAL *is the interchange of information on all subjects affecting the Telegraph and Telephone Service, the Managing Editor will be glad to consider contributions, and all communications together with photographs, diagrams, or other illustrations, should be addressed to him at the G.P.O. North, London, E.C.*1. *The Managing Editor will not be responsible for any manuscripts which he finds himself unable to use, but he will take the utmost care to return such manuscripts as promptly as possible. Photographs illustrating accepted articles will be returned if desired.*

VOL. XVI. JANUARY, 1930. No. 178.

A RETROSPECT OF 1929.

THE year which has just closed was one of considerable all-round progress in the telephone system of the British Post Office. There were approximately 1,850,000 telephones connected with that system at Dec. 31, 1929, making, with the telephones not belonging to the Post Office system, a total of about 1,886,500 in Great Britain and Northern Ireland. This represents an increase of 127,000 over the total for 1928. During the same year there was an increase of over 340 in the number of Post Office telephone exchanges and of about 4,500 in the number of call offices.

Steady progress was made in the conversion of the system to automatic working, 40 exchanges (excluding rural) being opened during the year, 16 of which were in London serving a total of 26,290 lines, and 24 in the provinces, serving 15,168 lines. Amongst the latter were Bath, Middlesbrough, Stockton-on-Tees, Colchester, Southend-on-Sea, Walsall and Crewe. The total number of automatic exchanges now working in London is 24, serving about 70,500 lines. A satisfactory feature is the development of the rural automatic exchange, no less than 85 such exchanges, with a total of about 750 working lines, having been opened.

As in the previous year, several important developments have to be recorded in the overseas telephone services. The hours of the transatlantic service were extended in September, and now include the whole 24 hours of the day. During the year Luxemburg, Gibraltar, Ceuta, Milan and some of the other chief cities in Italy, as well as Dublin, Belfast and the Isle of Man were placed in communication with America. A service between London and a special call office in Buenos Aires was opened in July. Telephone service was opened between this country and Poland and Finland, and the existing services to Czechoslovakia and Italy were extended to additional towns in those countries. So rapidly is the Anglo-Continental telephone traffic increasing that it has become necessary to arrange, in the coming financial year, for the provision of additional submarine cables both to France and to Belgium, which will carry additional circuits not only to those countries but to Germany, Switzerland, Italy, and other lands.

Another important event of the past year was the introduction of the " personal " call system in the Inland and Anglo-Continental trunk services. As this procedure becomes ever more widely known and appreciated its use bids fair to be extensive. On Oct. 1 new trunk rates came into force for calls over distances exceeding 200 miles, the reductions in the cost of communication between the South of England and Scotland being as much as two and three shillings for a 3-minutes' call in the morning hours.

To turn from the telephone to the telegraph service is to go from sunshine to shadow. The decline of inland telegraph traffic continues, though some small satisfaction may be gained from the fact that the rate of decline shows signs of slowing up. In September the Empiradio services and the Imperial Cables were transferred to a private company. The growth of the Anglo-Continental telephone service, while a matter for rejoicing in national and in telephone interests, may be at the expense in some degree of the Anglo-Continental telegraph service, but there are no certain indications of this. On the other hand, the rationalisation of the telegraph service, if that term may be borrowed from industry, is bearing fruit. The past year has seen a remarkable cut in the deficit on the telegraph service, and a reduction in the weight of that millstone will be hailed with joy by all interested in the service. The body of the telegraph service may have shrunk, but it will be a healthier body.

EUROPEAN TELEPHONE DEVELOPMENTS.

IN accordance with our custom at the beginning of the year, we offer our readers elsewhere a review of the telephone development of the world at the latest date for which comparatively complete figures are available. It will be seen that something less than a million and three-quarter telephones have been added to the world's total, which is now over 32,640,000. It is satisfactory to note that in Europe the total increased during 1928 by 644,000, the largest number yet recorded, the last time more than 600,000 telephones were added being in 1925. North America has increased by 906,000, which is a greater increase than took place in 1927; it was, however, exceeded in 1923 and 1925. The rate of increase in Europe in 1928 was 7.5%; in America 4.5%.

The largest additions to the European sum total are, as heretofore, in Germany, with 135,434 telephones, and in Great Britain, with 125,884. The largest percentage increases are Austria, with 27%, and Belgium and Russia, with 15%. France, it will be seen, is rapidly approaching the million mark, and has nearly doubled

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her total since 1921. In the same period Great Britain, with a much higher telephone density, has increased hers by 80%. Japan accounts for three-quarters of the telephones in Asia, whilst the Union of South Africa contains nearly half of those in Africa. The United States telephone system, of course, predominates in North America (nearly 19/20ths of the total), and the Argentine Republic possesses more than half the telephones in South America.

Without wishing to appear unduly optimistic, we may discern in the present position in Europe some satisfactory indications of an improving development. Many of the more backward countries are beginning to show undoubted signs of steadily progressing movement, and the larger countries, such as Great Britain, France and Germany, show higher increases each succeeding year. There is every promise that the increase in Europe during 1928 will be exceeded by that achieved during 1929.

SEA BREEZES.

THOSE who go down to the sea in ships judge and are judged more harshly than we others who remain ashore. Rough and ready in his speech and biting in his sarcasm, the seafarer faces nature in all its moods, tense or otherwise, and he is the last person in the world to bend to a torrent of abuse or to refrain from retaliation in kind.

The master mariner must be a superman. On his competency and judgment the lives of all depend; and always hanging over him is the threat of disparagement if things "gang agley." To misquote Goldsmith it may be said of him, "Do what you will. The critic will show the world you could have done better." The captain of the ill-fated *Vestris*, which was lost on the coast of America, was blamed on all sides for not having broadcast a wireless S.O.S. signal before it was too late; but no doubt he balanced all the circumstances and adopted what he considered the wisest course. The adverse criticism of his action may, however, have far-reaching effects on the policy of present and future master mariners and on the work at wireless stations. It may or may not have influenced those concerned in a more recent case. But the reader can judge for himself from the facts which are related below :—

During a gale last November, the skipper of a foreign ship in the English Channel sent out an S.O.S. signal at about 10.30 p.m. He gave his position and stated he was not under control and drifting ashore. Other wireless traffic was stopped. S.O.S. signalling filled the ether for nearly six hours. Within 30 minutes a British ship was found within helping distance and her course was diverted. The position was found to be wrong and some delay occurred in rectifying it. The ship in distress sent repeated messages of her danger and then five hours after the original call admitted, but only after enquiry, that she was then out of danger. The British ship's comment was blunt and to the point. "Yes, thank you. Glad the temperature of this gentleman's feet is now normal." Unfortunately there is no record of the retort courteous; but we have no doubt whatever that there was one.

HIC ET UBIQUE.

Here is still another claimant for the first telephone exchange in Europe.

The completion of the first 50 years of telephony in France was recently celebrated, we read in the *Electrical Review*. The first exchange in the country was set up in Paris in June, 1879, and started with seven subscribers! By 1899 there were nine exchanges in Paris with 6,255 subscribers, and 22 with 4,800 subscribers in provincial towns. About that time the service was taken over by the Government. To-day there are about 150,000 subscribers in Paris and 400,000 in the provinces.

Nevertheless, we still hold to our opinion that Coleman Street, London, was the first. Holcombe, in his "Public Ownership of Telephones on the Continent of Europe," says that three separate telephone undertakings were *authorised* in France (the Gower, the Bell-Blake, and the Edison systems) in the summer of 1879. The concessions were transferred from one promoter to another until, on Dec. 10, 1880, all found their way into the hands of a single company, the *Société Générale des Téléphones*. The first exchanges in Paris, he continues, were opened in the early part of 1881. In support of this statement he quotes the work of a French author, M. Roger Lacombrade, "*La Construction et Exploitation des Lignes Téléphoniques en France*," p. 42. The solution of this vexed question probably turns on the definition of the term "public exchange." Does an arrangement set up by a promoter to demonstrate that telephones can be interconnected constitute an exchange?

Father Ronald Knox, writing in the *Sunday Dispatch*, says he is not on the telephone for the following reasons :—

In telephoning, as in certain other sports, the challenging party always has the advantage; the ringer-up, if he knows his business, always gets he better of the rung-up.

The ringer-up has his story concocted beforehand; he invites you suddenly to a meal before you have time to make up an excuse for refusing; cries off a meal at the last moment before you can think of any names to call him; knows whom he is addressing; while the rung-up is desperately trying to decode the message, "This is John speaking"; asks you whether a story is true before you can make up your mind whether it ought to be public property.

The instrument, then, may be all very well for people who are prepared to take the offensive, and are fond of doing so; but we who dislike it, and dislike it all the more since it began to emulate the aluminium-name-plate machine, are at a disadvantage: we lose more than we gain by its presence.

Besides, I am a person who mostly stays at home; the people I try to telephone to are always out; there is no equality of opportunity about the thing.

I often find complaints in the papers about the telephone not working accurately enough; my trouble is that it is so relentlessly efficient; it would worry me like a second conscience if people were capable of ringing me up, and I them, at all hours.

We do not reproduce these paragraphs for the encouragement of budding Contract Officers, though Father Knox's testimony to the telephone's efficiency is quite handsome. But consider what incontrovertible claims could be made for the telephone as a school of ready-wittedness, preparedness, alertness of mind, inventiveness, prompt decision and all the virtues of hustling world; or alternatively, for those who cannot attain these qualities, what a force making for half-involuntary truthfulness.

The Postmaster of Altrincham has received the following letter from a Cheshire subscriber :—

I desire to place on record the courtesy of your telephone operator on the evening of Thursday the 14th inst., at approximately midnight.

My sister-in-law was overnight taken seriously ill, and being unable to reach her staff (her trained nurse having just left her), endeavoured to telephone

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for the doctor herself. The pain developed to a serious extent, however, and she found it impossible to wait on the telephone any longer. The operator just mentioned, realising the circumstances of the case, asked her not to worry any more than she could possibly help, for he would get the doctor and if necessary secure a nurse or any other help she required. He also attempted to reach friends as well as ourselves. In addition to this, before leaving duty at somewhere round 8 a.m. he was good enough to ring up and enquire whether he could assist in any further manner.

There are so many instances in which operators suffer discourtesy at the hands of subscribers and where many even reasonable complaints are needlessly exaggerated, that it is a pleasure to bring to your notice such conduct as the foregoing, which in the view of all of us concerned was beyond all praise.

According to *Telephony*, the Federal Statutory Court of New York City has given its decision as to the rates to be charged by the New York Telephone Co. The court has decided that the company is entitled to a 7% return on its property, and until the Public Service Commission has fixed a rate consistent with this decision, the company may increase its rates so as to ensure this return. The company are thus entitled to levy an additional $7,933,866 annual increase on telephone subscribers, but it is estimated that the net increase to subscribers would not amount to more than 4 or 5% at most. It is expected, says *Telephony*, that the bulk of it will be placed on telephone users in the State outside New York City.

Telephony also reports that new rates will come into force in San Francisco and Los Angeles on Jan. 1 of this year. In San Francisco the new rates represent an increase. The flat rate is to be abolished for business premises, and a rate of $5.25 a month (£1 1*s*. 10*d*.), including 85 calls, is to be introduced. This is equivalent to £13 2*s*. 0*d*. a year for 1,020 calls. The residence rate is to be $4.25 (17*s*. 9*d*.). equivalent to £10 13*s*. a year, including unlimited calls.

In Los Angeles the rates are being reduced. The business rate is $5.50 a month (£1 2*s*. 11*d*.) with 85 outward calls, or £13 15*s*. 0*d*. a year with 1,020 calls. The residence rate is $4.50 a month, equal to £11 5*s*. 0*d*. a year.

It is interesting to note that in each case you can have service with a wall set instead of a desk set for 25 cents less a month. On the other hand, a hand set costs 25 cents a month more in San Francisco, and 50 cents more in Los Angeles. Additional calls cost 3½ cents each.

We learn that a new schedule of trunk telephone rates comes into force in the United States on Jan. 1, representing an annual saving to the public of more than $5,000,000.

Approximately 45,000,000 calls a year, the majority inter-State, will be affected by the reductions. On most station-to-station daytime calls to points approximately 60 to 300 miles distant there will be a reduction of 10 cents. The new schedule also reduces the over-time charge on person-to-person messages of more than 10 chargeable minutes on nearly all distances. In addition there will be reductions in report charges ranging from 5 cents to 40 cents and affecting the schedule at distances generally from 100 to 2,200 miles.

This is the fourth decrease in toll and long-distance rates that the American Telephone and Telegraph Company and its associate companies in the Bell System have made in less than three and a half years.

Mr. Bernard C. Holding, for the past three years editor of *The Electrician*, with which journal he has been associated since 1923, has resigned the editorship to take up an appointment with the International Standard Electric Corporation, London, on Jan. 1.

WIRELESS AIDS TO NAVIGATION.*

BY F. ADDEY.

IN the April, 1928, number of the *Journal* a description was given of the way in which wireless comes to the aid of the navigator by providing him with accurate time signals. By these his chronometers can be checked and so the determinations of his position by astronomical observations made more accurate.

The accuracy of such determinations of position, however, although good enough when a ship is far from land, is not sufficient when she approaches the shore and finds herself in the neighbourhood of shoals and other dangers.

In order to determine the ship's position in these circumstances, recourse is had to various geometrical methods, which are based on observations made on prominent objects on the land. By optical or other methods the angle is measured which a line drawn from, say, a lighthouse, to the ship makes with the north-south line. This angle is called the "bearing" of the ship from the lighthouse. If a line be now drawn through the position of the lighthouse on the chart, making this angle with the north-south line, it is obvious that the position of the ship must be somewhere on this line.

If another determination of position be now made, as, for example, by a similar observation on another lighthouse, a second line on which the ship is also situated is obtained. The actual position of the ship is obviously the point where the two lines cross.

In foggy weather, when the prominent objects on the land cannot be seen, optical determinations of position are not possible, and until recent years ships were reduced to groping their way by means of soundings, the depth of water and the nature of the bottom being used as indications of position, or by audible fog signals.

Nowadays, however, all this is changed. The bearings can be observed by wireless means, and as these are independent of the visibility, ships can now approach the coast in fog with almost as much ease as they can in clear weather.

The following paper deals with the various methods which have been devised, and the organisation which has been built up, by which this very important advance in navigational methods has been brought about.

If a loop of wire is used for the aerial of a wireless receiving set the strength of signals will depend on the position of the loop with reference to the direction of the transmitting station. If the plane of the loop is pointing towards the transmitting station the strength of the signals will be the maximum. If the loop is turned from this position to a position in which its plane is at right angles to the direction of the transmitting station the signal strength will fall to zero. If the rotation of the loop is continued the signals will again come in, and will rise in strength until, when the plane of the loop is again pointing towards the transmitting station, they reach the maximum strength from which they started. Thus, by observing the strength of the signals received by such a loop the direction of the transmitting station can be determined.

It is found easier in practice to determine the position of the loop where the signals fall to zero, that is, the position in which the plane of the loop is at right angles to the direction of the transmitting station, rather than to determine the position of the loop which gives the maximum signal strength. When the position of the coil at which the signals fall to zero has been determined, the transmitting station is in the direction at right angles to the plane of the loop.

The arrangement just described, however, only tells the line on which the transmitting station lies, it does not tell on which side of the receiving station the transmitting station is situated. However, by combining the signals received on an ordinary aerial with those picked up by the loop this ambiguity can be removed, and the direction towards the transmitting station from the receiving station definitely determined.

When these directional methods of reception, as they are called, were first introduced the receiving apparatus available was much less sensitive than it is to-day, and as a consequence large loops were required in order to give sufficient strength to the signals. The larger the loop the greater the signal strength which is obtained. Such large loops, perhaps 30 or 40 feet square, could not, however, be rotated with any facility in order to find the position of the transmitting station. In order to overcome this difficulty the system of large fixed crossed loop aerials was devised by Bellini and Tosti. Two loops whose planes are at right angles to one another are erected. Each one is joined to a small coil of wire in the receiving apparatus in the station. The planes of these coils are also arranged at right angles to one another. The waves from the transmitting station affect each of the large loops to a greater or less extent according to the position of the loops with reference to the direction of the transmitting station, and so the effects produced in each of the coils joined to the loops also depend on the position of the transmitting station. The resulting currents in the small coils set up magnetic fields which combine to produce a resultant field the direction of which depends on that of the transmitting station. A small rotating coil placed in the space between the small coils mentioned above is then used to determine the direction of this resultant magnetic field, and thus

* Paper read before the Telephone and Telegraph Society of London.

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the direction of the transmitting station is found. Arrangements are made by which, when a bearing is not being taken, the connexions can be modified so that the installation will receive uniformly in all directions.

The Bellini-Tosi system has been considerably improved in recent years, due largely to the introduction of the thermionic valve, and has now been installed at the Post Office coast wireless stations at Wick, Cullercoats, Humber, Niton, Lizard, Portpatrick and Malin Head. Up to the middle of October last the Lizard station was operated by the Admiralty. By means

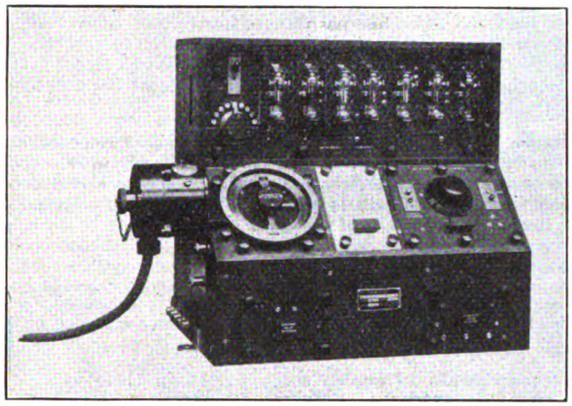

FIG. 1.—MARCONI DIRECTIONAL RECEIVER FITTED WITH GYRO COMPASS REPEATER SCALE.

of these direction-finding stations ships approaching the coast can have their bearings from the station observed and communicated to them by wireless. They can then plot these bearings on the chart and so ascertain their position.

The original direction-finding stations, on account of the very large aerial loops which were necessary, were only suitable for erection on land. The greater sensitivity of reception which followed the introduction of the three-electrode valve enabled the size of the loops to be reduced, so that direction-finding installations could be placed on ships. The direction-finding installation on a ship has a great advantage from the point of view of the navigator in that he is at liberty to take as many bearings as he wishes on any shore wireless station which he may hear working, or, if necessary, as in going to the assistance of a ship in distress, on any ship station.

The zero on the scale of the direction finder on a ship corresponds with the dead ahead direction, so that the bearings actually observed give the position of a transmitting station with reference to the centre line of the ship. From a knowledge of the direction in which the ship is steering when the observation is taken the bearing of the transmitting station from the ship with reference to true north can be determined.

The improvement in reception brought about by the introduction of the valve has not only enabled the crossed loops to be diminished in size, but has enabled aerial loops to be used which are sufficiently small to be rotated, and many of the installations on board ships are now of this type. The rotating loop is mounted in such a way that it can be turned by means of a wheel resembling the steering wheel of a motor-car, and the bearings are read by means of a scale graduated in degrees, which is attached to the wheel.

A rotating loop system, devised originally by Dr. Robinson for aeroplanes, but now installed on a number of ships, utilises the maximum and not the minimum of the signals. It consists of two loops, known respectively as the main and auxiliary coils, which are fixed together at right angles to one another and joined electrically in series. By means of a switch the auxiliary coil can be placed in series with the main coil in either one direction or the other. The combination of the two coils is joined to the receiver. To take a bearing, one of the loops, known as the main coil, is set so as to receive signals as far as can be judged at maximum strength. The other, the auxiliary coil, being at right angles to the main coil, should therefore be in the position to receive zero signals. If the coils are correctly placed, so that the auxiliary coil does actually not pick up any signals whatever, no change in the strength of signals will be caused by moving the switch and so reversing the direction in which the auxiliary coil is joined to the main coil. If, however, the coils are not correctly placed the auxiliary coil will be picking up some signals and these, in one position of the switch, will add their effect to the signals picked up by the main coil, while in the other position of the switch the auxiliary coil signals will oppose those received in the main coil. In these circumstances moving the switch will vary the strength of the signals and so indicate that the adjustment is not correct. The coils are rotated until moving the switch produces no effect on the signals. The main loop is then pointing at the transmitting station.

For the use of trawlers and smaller vessels the Marconi Company have introduced a simplified form of direction-finding apparatus known as the Direction Indicator. It consists of a loop aerial sufficiently small to be rotated by hand. A pointer attached to the loop moves over a compass card. The position of this card can be adjusted before an observation is taken to allow for the direction in which the ship is steering. The rotating loop is permanently associated with a small open aerial so that the actual direction of a transmitting station is given without the ambiguity mentioned above.

It has been already mentioned that when a bearing has been taken by the direction-finding apparatus on a ship it is necessary for allowance to be made for the direction in which the ship is steering in order that the true bearing of the transmitting station from the ship can be obtained. Various devices have been invented to enable this correction to be performed more or less automatically. Sometimes a second scale is fitted to the direction-finding apparatus. This scale is rotatable, like the compass card on the direction indicator just mentioned, and before a bearing is taken it is turned so as to show true bearings, the information to enable this to be done being obtained from the navigating officer on the bridge.

If the ship is fitted with a gyro compass a repeater from the compass installation may be placed by the side of the direction-finding apparatus, so that the wireless operator can see the course which the ship is steering and make the necessary allowance at the time when he is taking a bearing. A further development of this idea is to cause the movable scale mentioned above to be controlled by the gyro compass installation so that the readings of the direction-finding instrument are automatically the true bearings of the transmitting station concerned.

At a direction-finding station, whether on land or on a ship, the presence of metallic masses, wires, &c., will cause the paths of the wireless waves reaching the station to be distorted, with consequent errors in the bearings. At a land station this difficulty is overcome by the station being calibrated. Simultaneous wireless and visual observations are made on a ship which sails round the direction-finding station and transmits signals at suitable intervals. In this way the difference between the true bearings observed visually and the wireless bearings are ascertained and a correction table can be drawn up.

In the case of a ship the metal hull causes the wireless waves to be distorted in such a way that all the bearings are shifted towards the fore and aft line. With the crossed loop system this has the effect of making it appear that the fore and aft loop is more effective as a receiver than the thwartships loop. It can be compensated for by reducing the size of the fore and aft loop, or by diminishing the strength of the signals received on this loop in other ways. In this way calibration errors mentioned above can be eliminated. In the case of a rotating loop installation, however, such an adjustment cannot be made. It has, however, been found that with nearly every ship the errors produced in the way described are associated

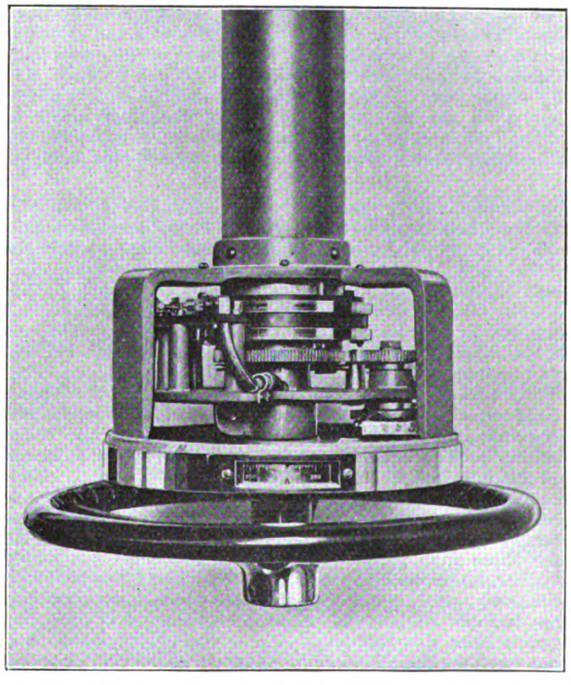

FIG. 2.—HANDWHEEL AND SCALE OF RADIO COMMUNICATION COMPANY'S DIRECTIONAL RECEIVER, SHOWING GEARING FOR CORRECTING CALIBRATION ERROR.

with the true bearings according to a definite mathematical law. By suitable gearing, designed in accordance with this law, the scale from which the bearings are read can be caused to move in one direction or the other so as to compensate for the errors introduced by the distortion of the waves. The Radio Communication Company use an installation embodying this arrangement which was designed by Mr. Best, of that Company.

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The crossed loop system has been adapted by the Radio Research Board for the purpose of observing the directions of the sources of atmospherics. Instead of receiving the signals by telephone a cathode ray oscillograph tube is used. Two pairs of metal plates are placed in the tube, these pairs being at right angles to one another. The stream of electrons from the filament of the tube is projected between the plates of each pair and then impinges on a fluorescent screen at the end of the tube, where it produces a bright spot of light. Each pair of plates is connected to a separate receiving apparatus

FIG. 3.—START POINT WIRELESS BEACON.

joined to a loop aerial, one of these loops being in the north-south direction and the other one in the east-west direction. When the oscillating potentials due to a signal are impressed on either pair of plates the electron stream is diverted, and the spot of light drawn out into a line. The two pairs of plates divert the stream in directions at right angles to one another, the deviation produced by either pair of plates being proportional to the strength of the signals received on the corresponding loop. The final result is that the direction of the line of light on the fluorescent screen indicates the direction of the transmitting station from which the signals are being received.

Up till comparatively recently ships fitted with direction-finding installations took bearings on the ordinary shore wireless stations, either as opportunity offered or by arranging for the shore station to transmit specially. The need of some more convenient arrangement was, however, early felt and to this end a number of wireless beacons have been erected round the coast. These transmit signals at regular intervals. At present such beacons are in operation round the British coasts at Kinnaird Head in Scotland, the *Spurn* light-vessel on the Humber, Cromer, Dungeness, Start Point near Plymouth, The Casquets in the Channel Islands, Round Island in the Scillies, Lundy Island, the South Bishop off Pembrokeshire, the *Coningbeg* light-vessel off the south-east of Ireland, the Skerries off Anglesey, the *Bar* light-vessel in Liverpool Bay and Sule Skerry off the north-east coast of Scotland. The emission of the signals from these beacon stations is controlled automatically. A clock is arranged to join up a motor-driven transmitting key for one minute every four minutes, and during this minute the series of signals proper to each beacon is automatically transmitted. During clear weather the clock is arranged only to set the transmitter in operation for three such periods during each alternate quarter of an hour. In foggy weather, however, by switching over by hand, the beacon is arranged to run continuously, sending out its signals for one minute every four minutes. With a large number of beacons working together it is essential, in order that the signals from one beacon shall not clash with those from another, that the transmissions should take place exactly at the proper times. A semi-automatic arrangement is, therefore, provided by which the control clocks at the beacon stations can be set to correct time on receipt of a wireless time signal.

It is very desirable that a ship should be able to find her distance from a light vessel as well as her bearing. Arrangements for enabling this to be done have been made on the *Spurn*, *Coningbeg* and *Bar* light-vessels. In addition to the wireless beacon these vessels are fitted with submarine signalling gear by which a sound signal is passed out into the sea and can be picked up by suitable receiving apparatus on ships. The velocity of wireless signals is so great that the time taken for them to reach the ship is negligible. The time taken by sound to travel one nautical mile in sea water is, however, about 1¼ second. Consequently the wireless signals are heard on the ship immediately they are transmitted, but the sound signals are not heard until after an interval of time which is longer the further away from the beacon the ship is situated. A sound signal and a wireless signal are simultaneously transmitted, and on the ship the interval which elapses between the receipt of the two signals is observed. Knowing how long it takes sound to travel one mile in sea water the distance of the beacon can thus be calculated.

In order, however, to avoid this calculation arrangements are made by which the distance can be indicated automatically. After the transmission of the simultaneous wireless and sound signal already mentioned a series of dots is sent by the wireless transmitter, these dots being spaced at 1¼ second intervals. If, therefore, the navigator counts the number of dots which he hears between the receipt of the wireless signal and the receipt of the simultaneously emitted sound signal he obtains the number of nautical miles by which he is distant from the beacon.

A further advance has been made by which the observation of the distance can be made with even less trouble. A clock is installed on the ship which is started immediately the wireless signal is heard and is stopped immediately the sound signal is heard. The dial is graduated in nautical miles, one division on the face of the clock corresponding to the space through which the hand moves in 1¼ seconds. In this way the distance of the beacon is automatically indicated.

The signal apparatus on the light vessels is operated by pneumatic keys similar to the mechanism of a pianola, which are controlled by a perforated leather belt.

The arrangements to enable ships to obtain their bearings described so far have all assumed the operation of a directional receiving apparatus, either on the shore or on the ship. Another solution of the problem is to provide on the shore a directional transmitting installation, the ship being fitted with an ordinary non-directional receiving apparatus and ascertaining her bearings from the transmitting installation by the nature of the signal which she picks up. The Marconi Company has installed at the South

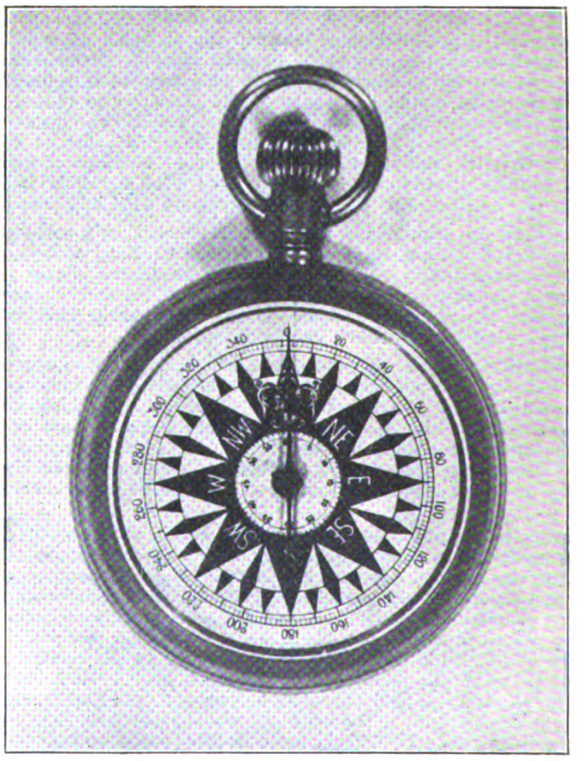

FIG. 4.—STOP-WATCH WITH COMPASS DIAL FOR USE WITH ROYAL AIR FORCE ROTATING LOOP BEACON.

Foreland station an experimental beacon of this nature in which a small beam aerial, radiating a wavelength of about six metres, is mounted on a turn-table which can be continuously rotated. The signals from this aerial are restricted to an arc of about 20 degrees. As the beacon rotates a distinguishing letter is sent out for each 64th part of a complete rotation, and by observing the letter which is heard most loudly as the beam sweeps across the ship the position of the ship relatively to the beacon can be ascertained.

Another directional transmitting system has been designed by the Royal Air Force and is at present being tested experimentally at Orfordness, near

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Felixstowe. It consists of a large loop aerial which is continuously rotated while signals are being transmitted. With such an aerial the strength of the transmitted signals varies from the maximum in the plane of the loop to a minimum or zero on the line at right angles to the plane of the loop in exactly the same way as the strength of the received signals varies on a loop aerial. As the loop rotates, therefore, a beam of silence along the line at right angles to the plane of the loop is swept round. As this beam of silence passes through the north-south line a definite signal is transmitted, which is heard by all ships within range which are not on the north-south line. When the beam of silence reaches the ship the strength of signals falls and then immediately rises again. The beacon makes one complete rotation in one minute, so that it turns through six degrees in one second. By observing the interval in seconds between the "North" signal and the instant at which the signals reach their minimum strength and multiplying this munber of seconds by six, the bearing of the ship from the beacon is obtained. For the benefit of ships which are on the north-south line when the "North" signal is given, another signal is transmitted when the beam of silence sweeps through the east-west line. The interval in seconds between this signal and the minimum multiplied by six gives the bearing of the ship from the beacon reckoned from east, and by adding 90° to this the bearing from north is obtained.

During the experimental trial of this beacon it has been shown that ships can obtain bearings from it of the same order of accuracy as can be obtained by the ordinary direction-finding apparatus. The observations are actually made by a stop watch which is started when the "North" or "East" signal is received and the reading of which is noted when the signals fall to minimum. In order to avoid the necessity of any calculation the ordinary watch dial may be replaced by a dial on which a compass card and scale of degrees are printed so that the bearing of the ship from the beacon can be read at once.

An ingenious development of the directional loop transmitter has been made for the purpose of guiding aeroplanes or ships along a definite line. Two transmitting loops are used with their planes making an angle of 70° with one another. Transmission is continuous, the letter A (· —)being sent from one loop and the letter N (— ·) from the other loop. The keys by which these signals are sent are interlocked so that the dots and dashes of one series of letters occupy exactly the spaces between the signals in the other series of letters. If now a receiving station be situated on or near to the line which bisects the angle between the transmitting loops the signals from each loop are heard at approximately equal strength, and consequently they blend together to form a continuous dash. If, however, the receiving station should deviate from this line the strength of the signals from one or the other loop will predominate and the corresponding letter will be heard. In this way the ship or aeroplane can keep herself on the correct line.

The Direction-Finding Service of the Post Office commenced in 1925. Since the inauguration of the service to the middle of the present year a total of 33,961 bearings has been given to ships from all the British direction-finding stations. Of these 21,142 have been given from Post Office stations. It will be remembered that up till October last the *Lizard* station was worked by the Admiralty. Only 14 complaints of inaccurate bearings have been received regarding those given by Post Office stations. Each complaint has been thoroughly investigated by comparing the information in the navigation log of the ship concerned with that available at the direction-finding station and as a result of these investigations only three complaints have been substantiated. As the direction-finding stations of the Post Office, except that at Lizard, are also engaged in dealing with ordinary ship and shore traffic such a satisfactory result is highly creditable to the staffs concerned.

The number of British ships on which direction-finding gear was fitted was 225 in the middle of 1925. The number has now risen to over 800, which is 22% of the total number of ships fitted with wireless, and is still increasing rapidly.

In addition to the greater facilities for obtaining bearings which wireless has conferred on the navigator there are also other applications of wireless technique which are useful to him.

The recent advances in the methods of sending pictures by wireless enables weather charts to be transmitted to a ship, and so gives the navigator detailed information as to the weather he is likely to experience.

Another application of wireless to navigational problems has been made on the Clyde. There two fog guns, one situated on an isolated sand-bank in the middle of the estuary, are controlled by wireless signals from the shore, being started up and stopped as the conditions of visibility demand.

Lastly, wireless technique in connexion with the thermionic valve has been utilised in automatic sounding apparatus. A sound signal sent down from the ship is reflected from the bottom and reaches the ship again. The time taken for the signal to travel down and back again is obviously a measure of the depth of the water. By means of a microphone and a valve amplifier the sound, when it returns to the ship, is caused to actuate an indicating device which records the interval of time which has elapsed since the sound was sent down. The indicator is graduated to show directly the depth of the water in fathoms.

PROGRESS OF THE TELEPHONE SYSTEM.

THE total number of telephone stations in the Post Office system at Oct. 31, 1929, was 1,822,990, representing an increase of 8,727 on the total at the end of the previous month.

The growth for the month of October is summarised below :—

	London.	*Provinces.*
Telephone Stations—		
Total at Oct. 31	651,832	1,171,158
Net increase for month	3,865	4,862
Residence Rate Subscribers—		
Total	158,614	249,490
Net increase	1,531	1,845
Call Office Stations (including Kiosks)—		
Total	5,746	23,358
Net increase	29	406
Kiosks—		
Total	1,515	5,784
Net increase	36	122
Rural Party Line Stations—		
Total	—	10,405
Net increase	—	—
Rural Railway Stations connected with Exchange System—		
Total	17	1,298
Net increase	—	68

The total number of inland trunk calls dealt with in August, 1929 (the latest statistics available) was 9,845,272, representing an increase of 627,783, or 6.81%, over the total for the corresponding month of the previous year.

The outgoing international calls in August, 1929, numbered 40,620 and incoming calls 46,007, representing increases of 7,648 (23.2%) and 8,806 (23.7%) respectively over August, 1928.

Further progress was made during the month of November with the development of the local exchange system. New Exchanges opened included the following :—

LONDON—Hendon (automatic), Ilford (automatic).

PROVINCES—Cleethorpes, Egham, Farnborough (Hants), Davidsons Mains (automatic); Auchengray, Bainbridge, Banknock, Fenny Compton, Fundenhall, Kinlochleven, Kinnersley, Laxton, Longville, Lothersdale, Toward, Tysoe (all rural automatic),

and among the more important exchanges extended were :—

LONDON—Barnet, Hounslow, New Cross, Wanstead, Wimbledon.

PROVINCES—Burton-on-Trent, Beaconsfield, Chelmsford, Chichester, Derby, Eastbourne, Kettering, Leamington Spa, Selly Oak, Stratford-on-Avon, Taunton.

76 new overhead trunk circuits were completed, and 83 additional circuits were provided by means of spare wires in underground cables.

LIVERPOOL TELEPHONE SERVICE NOTES.

WE regret to record the death of Mr. J. M. Mayes (Daddy), late Assistant Traffic Superintendent, Liverpool, at his residence, Blackpool, on Nov. 23 last. His retirement, which took place in September, 1928, was due to ill-health, borne with fortitude over a long period. Daddy had much in his character that was lovable, and it was hoped that, relieved of the responsibilities of official duty, a few years of quiet leisure would be his; but such was not to be. To his widow we extend our sincerest sympathy.

Staff changes have been frequent of late, and we take this opportunity to welcome Mr. Aickin from Canterbury, and Messrs. McBride and Henthorne from the Liverpool Engineers (External). C. H.

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REVIEWS.

"Elements of Radio Communication." By John H. Morecroft. Published by Chapman & Hall, Ltd., London. + 269 pages. Price 15s. net.

This book has been written as an introduction to the well-known treatise on wireless telegraphy by the same author entitled "Principles of Radio Communication." It is intended for that type of reader who is really interested in the subject, and who wishes to have something better than the popular books and periodicals, but who has neither the time nor the necessary preliminary training to work through a book such as the "Principles."

As the greater proportion of students of wireless are now-a-days interested in the subject from the point of view of the reception of broadcast programmes, special attention has been paid to that aspect of the matter.

In the first chapter an account is given of the fundamental general laws of the electric circuit, and the second chapter is devoted to those laws which are specially met with in connexion with high-frequency work.

The next chapter gives a general view of communication by wireless.

Then follow three chapters dealing respectively with valves, radio telegraphy, and radio telephony. The final chapter is devoted to a full description of the various circuit arrangements used for receiving sets.

The book is well got up, the paper and printing are good, and the diagrams, with which it is very fully illustrated, are clearly drawn and well reproduced.

At the end of the book a set of problems for each chapter is given. These problems should prove very useful to a student working through the book without the aid of a teacher, but their usefulness for such a student would be greatly increased if the answers to the numerical problems had been given.

We can recommend the book to any reader who wishes to obtain a sound elementary knowledge of the fundamentals of radio-telegraphy and radio-telephony

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"Loaded Submarine Telephone and Telegraph Cables." Published by Siemens Brothers & Co., Ltd., Woolwich. 62 pp.

This volume gives an account of the "loaded" submarine telephone and telegraph cables manufactured, and in most cases also laid, by Siemens Brothers & Co., Ltd., of Woolwich, one of the pioneers in this branch of the electrical industry.

The opening chapter gives a short history of the progress and development of cable "loading," while successive chapters contain illustrated descriptions, supplemented by copious tabular matter, of coil-loaded and continuously-loaded telephone cables insulated with gutta-percha and paper respectively, and continuously-loaded gutta-percha insulated telegraph cables.

A useful mathematical treatise on telephonic and telegraphic transmission with conversion tables is given in an Appendix.

The book is admirably got up and well illustrated with plates, showing the various kinds of cable, and with excellent maps. It should prove a very useful work of reference.

PARLIAMENTARY QUESTIONS.

TELEPHONE DEVELOPMENTS.

ON Nov. 12 Mr. D. G. Somerville asked the Postmaster-General if he could state at what date he expected that all exchanges in the London area would be converted to the dial system; what was the estimated aggregate cost and duration of the original conversion scheme; and what would be the additional cost as a result of its acceleration.

Mr. Lees-Smith said that, normally, the conversion of a manual to an automatic exchange did not take place until its capacity was exhausted or until the economic life of the plant had expired. The date of complete conversion of the London area to automatic working depended, therefore, to some extent on the rate of growth of the demand for telephones. About 130 exchanges were expected to be working on an automatic basis by 1940, when about 20 exchanges would remain for conversion. The programme was necessarily tentative, and while progress up to the present had been rather more rapid than was anticipated, there had been no departure from the principles on which it was regulated. Any deliberate acceleration beyond the needs of the service would involve heavy wastage of capital. On the basis of present prices the expenditure on buildings and equipment for automatic exchanges up to 1940 would be of the order of £25,000,000, of which (for the reasons stated) a large part represented ordinary replacement and development liabilities which would be necessary under manual conditions.

Mr. Lees-Smith informed Mr. Ross that schemes were in hand for improving telephonic communication between Belfast and Glasgow, and the Northern Ireland portion of the work would begin next year. The total cost was estimated at £233,600, of which the Northern Ireland portion amounted to about £40,000, divided nearly evenly between duct work and cabling.

Mr. Bowen asked whether the telephone construction works announced by the Lord Privy Seal were additional to the normal programme for the year.

Mr. Lees-Smith said that they were an acceleration. The authorised construction programme for the current year amounted to £10,500,000. Works estimated to cost £750,000 in addition to this authorised programme had now been sanctioned and would be put in hand forthwith.

NORTH MIDLAND DISTRICT: NOTTINGHAM.

THE first of a series of winter social events took place at Castle Gate Lecture Hall, Nottingham, on Nov. 4, when a lecture on "Old Nottingham" was given by Mr. J. Holland Walker, F.S.A.

Mr. Holland Walker, in the course of a most interesting lecture, referred to the mediaeval days when Nottingham was for a time the Windsor, the Westminster, and the Aldershot of England centred in old Nottingham Castle.

The lecture, which was splendidly illustrated, was much enjoyed and hearty thanks were accorded to the lecturer and to Mr. D. J. Barnes, District Manager, who kindly occupied the chair.

A.G.D. SPORTS ASSOCIATION DANCES.

THE twentieth of the series of dances run under the auspices of this association was held at Lever House on Dec. 2 last and was both enjoyable and successful, as these dances usually are.

London readers should make a note of the date of the next dance, which is fixed for Wednesday, Feb. 5, at Lever House. Tickets, 2*s.* 6*d.* each, may be obtained of officers of the Association.

"DAILY MAIL" SCHOOLBOYS' EXHIBITION.

THIS Exhibition, of wonderful interest to every boy, was opened by the Hon. Esmond Harmsworth on Tuesday, Dec. 31, at 10.30 a.m. and will remain open each day from 10 a.m. to 9 p.m. until Jan. 8. Amongst the principal features will be Seaplane and Motor Speed Craft, Railway Expresses, and 'Secrets of the Telephone.'

Boys will have an opportunity of getting "behind the scenes" of the telephone system and will be able to find out just how the automatic works and how and why the bell rings. There will also be long-distance calls from the Exhibition to America, Germany, Scandinavia, and elsewhere.

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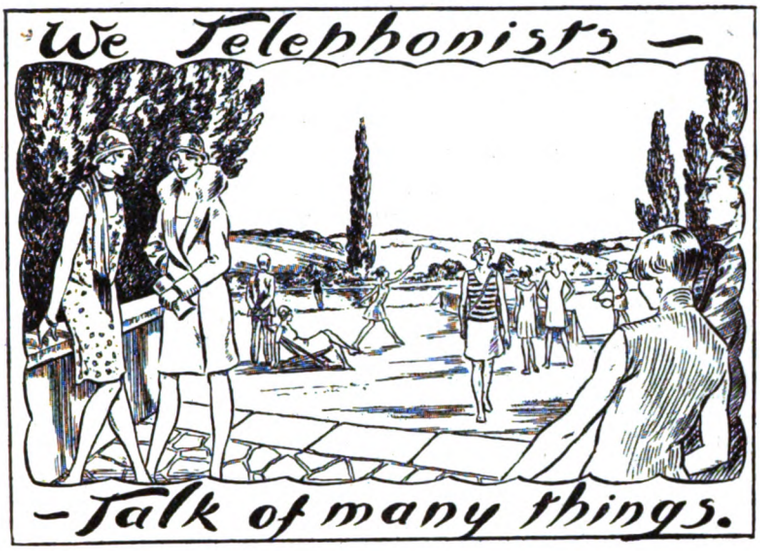

A New Year Bleating.

BEST wishes to you all for the New Year. I hope you've all come safely through Christmas without any gastronomic catastrophe, and that the jolly old mistletoe didn't blush itself into a holly berry, and that the hope that springs eternal in the suspended stocking was realised to the full, and that the pudding contained nothing less edible than bells and rings and threepenny-pieces. Most of all I hope you'll keep on hoping throughout the year, because if you stop hoping or lose the hope you had, you might just as well have stopped short on Dec. 31 last and never bothered to greet the happy morn. If it be true to say that while there's life there's hope, it is, I think, even truer to say that while there's hope there's life. Perhaps you feel you can't believe me—if so ask the robin, he told me all this. I met him on a grey, cold and cheerless day. The wet mist hung low and still, the grass was dull and spiritless, the trees were bare and dripped sadly, the sky scowled and wept fitfully, the face of Nature was mournful and it seemed as though she had ceased to care! I felt that life had stopped—and then the robin spoke. He was perched upon a bare bough just above my head. The glow of his breast was the only colour in life, the soft trill of his note was the only music in the world, and all animation was centred in his quick tricks and turns. I stopped short and raised my head, and as he fluted again I said, "Hi, why on earth are you singing!" He bent a bright thoughtful glance upon me and after a pause he said, "Because the earth is so heavenly." I told him plainly what I thought of things in general but he only laughed and said, "This is not death, this is only sleep and I sing because life that is now dormant will shortly burst forth gloriously." As he called softly there came an answer, faint with distance, which said "Robin my man, who's your friend?" "Just a human who's blue," Robin replied. "Oh, the old fool" said his mate, "He's missed his morning worm. Come away my Robin." And he went. The breeze stirred softly, the mist swirled, the rain-drops pattered suddenly, the grass waved gently, a gleam from a watery sun lighted the earth momentarily with a touch of gold, and the sound of an organ welled out from the nearby church. I knew that the robin was right. Wherefore I say again, best wishes for the New Year and I hope that my introduction of it has not produced a hopeless yawn.

PERCY FLAGE.

Regent: An Unusual Present.

It is not every Telephonist who, on leaving the Service, is presented with a picture of which she, herself, is the subject. Such, however, was the experience of Miss Henderson who has recently departed from our midst to be married. Among the numerous and beautiful presents displayed, one, a large picture, caught the eye immediately. A study in black and white, it represents a switchroom. In the centre of the room stands a Supervisor, and facing her, with her back to the "Audience," is a Telephonist. Issuing from the lips of the Supervisor is the legend "What! Another casual, Miss Henderson!!"

Our artist, Miss Nicholls, has perpetrated a dreadful female for the Supervisor. Tall, thin, angular, her hair piled high upon her head as if in protest against the prevailing fashion, she frowns upon the offender standing meekly before her. Her face is drawn up in a most disapproving manner and seems to be held in place by her high collar. The papers in her hand might well be P.M.18s for excessive casuals to judge by the satisfaction with which she flourishes them. Meanwhile, the culprit stands with head slightly bent, one ear plait well below the other, disarranged I suppose by her instrument. The Supervisor's eyebrows would mount a trifle higher could she but see the back view of this audacious suppliant for, dangling from the Telephonist's finger is a small packet, about the size of a sandwich . .

With horror depicted on their countenances the other Telephonists have turned from the switchboard to regard this modern Oliver Twist arisen among them.

Our artist could not even leave it at that! No; rounded off in one corner of the picture is a lightning impression of a train just moving out of the station, of a girl fleeing down the platform after it, and of a small packet about the size of a sandwich dangling from her fingers!

All our good wishes go with Miss Henderson, and we are sure that this picture will remind her of many happy hours spent at Regent, despite the dread Supervisor portrayed therein.

W. M. G.

Contrition.

Ah, woe is me! Alackaday!
That I should seemingly betray
A hint of boredom with the Boy
Who makes our Ladies' Page a joy!

Alas! That such a crime could be!
What treason to impute to me!
(I had no motive at the time,
But merely put it in to rhyme!)

A thousand pardons, dear P. F.!
You know we all give *you* the "pref"—
Your airy persiflage is such,
We simply *cannot* have too much!

What I intended to convey,
Was, my enjoyment of the way
Our "Bonnie Jean" doth nip your "dud"
But naive, disclosures in the bud!

My full confession here inditing,
I've let you have it all *in writing*—
But if my plea for pardon's vain,
Well—I shall never smile again!

C. A. S.

Contributions to this column should be addressed: THE EDITRESS, "Talk of Many Things," *Telegraph and Telephone Journal*, Secretary's Office, G.P.O. (North), London, E.C.1.

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LONDON TELEPHONE SERVICE NOTES.

Contract Branch Notes.—The business done by the Contract Branch during the month of November resulted in a net gain of 5,210 stations as compared with 6,064 last year. Trade conditions were very dull during the month and new orders very difficult to obtain, especially in the city area.

* * * *

The tone of the following extract from a letter is familiar to most telephone people who come into contact with the public.

"With colossal difficulty I rang up the schools to get a last word of the children and was answered by congenital idiots who said they thought the kids were all right. I was so exhausted by wrong numbers and saying my name wasn't Campbell that I just left it at that."

This letter did not refer to the London service, but to Canada, and it is interesting to know that the wrong number trouble does cause flurried tempers across the Atlantic.

* * * *

An interesting function took place at the North West District Contract Office on Dec. 6, when Mr. Weaire was the recipient of a clock, cutlery, and cheque, as a mark of the esteem of his colleagues on the occasion of his retirement.

Mr. Weaire joined the Telephone Service as a Contract Officer under Mr. Walker on Nov. 25, 1901, and had been at the North-West District Office as a First Class Contract Officer since Mar. 26, 1923.

Mr. Weaire is a prominent bowler, being the hon. sec. of the Alexandra Palace Bowling Club, and he was one of the team which won the "Bunbury Cup" for the L.T.S. last season.

The best wishes of the staff will go with Mr. Weaire on his retirement.

* * * *

Football L.T.S.—An unusual amount of interest has been manifested in the recent performances of the team, and the best win of the season of 7 goals to nil was recorded in the match played against the Board of Education on Nov. 30. Watching this game one was impressed by the forceful work of the forwards and the sound display of the full backs.

The goalkeeper had a quiet day; as for the half-backs, they seemed to get the ball somehow but displayed little constructive football, and one looked and hoped for the sharp ground pass to the forwards which makes such a wonderful difference to the display of a team, nevertheless, they certainly made a hack of the opposing forwards' efforts to score goals, and in that respect they may be regarded as being completely successful.

The full backs provided a complete contrast in styles; Thomson with his neat touches and imperturbable manner, and Webdale full of dash and thrust, and a real terror to timid forwards.

The forwards were a virile line with Gordon and Buckley outstanding. Gordon has lost none of his craftiness and his goals were cleverly obtained. Buckley at inside left is a player of distinct promise, and the power behind some of his drives is astonishing for a player of his size. Casey, introduced for the first time at outside left, was a distinct success, and one shot of his, in the second half, which hit the far post, was as meritorious as some of the more successful scoring efforts. This team will continue to do well if they can be kept together, but one would like to see them more fully extended before finally passing judgment.

The match played on Dec. 7 against Hicomind resulted in a win by 2 goals to nothing.

* * * *

Dance.—The dance organised by the L.T.S. Football Club Social Committee and held in the Luncheon Club, Cornwall House, on Thursday, Dec. 12, 1929, developed into a very enjoyable evening for the 130 people present. It was pleasing to note the generous support forthcoming from our colleagues in the various Exchanges and in the London Engineering District, and as a consequence the Club funds should benefit substantially.

Many enquiries have already been made as to when the next dance will take place, and it is hoped that it will be possible to fix on a date early in January next.

* * * *

L.T.S. Sports Association: Tennis Section.—The Annual General Meeting of the Tennis Section will be held at Cornwall House, on Monday, Feb. 17, at 6 p.m.

* * * *

Post Office Ambulance Centre: Annual Competitions.—The annual competitions for the London Postal Challenge Shield and for the Women's Trophy were held on Wednesday, Nov. 20, at King George Hall, Y.M.C.A., Tottenham Court Road.

There was a large and encouraging audience, which appeared to appreciate the difficulties of the "First Aiders," especially when those too enthusiastic floundered through the hole in the imaginary ice; but which also applauded well when the materials which were at hand were correctly used—for it must be remembered that a frozen pond on a snowy day does not seem, at first sight, to offer much assistance in rescuing a drowning man with arterial bleeding, a lad with a fractured leg and another with a broken wrist.

The "calamity" was, however, a test of leadership, and the Controller's Office, L.T.S. were fortunate in having Mr. R. V. Poor as leader, for his team was the winning one, scoring 230 points out of 300.

The highest score of the Ladies Team was 223, gained by the L.T.S. womens' team under the leadership of Miss B. L. Webb.

The London Telephone Service was thus doubly honoured by winning both shields.

In his address, Mr. Viant, M.P., the Assistant P.M.G., spoke of the sense of duty and good citizenship which "First Aiders" have and, having in mind the increasing number of daily accidents, visualised the day when those who die from accidents would out-number those who die naturally in their beds.

Classes are being arranged in the Women's Section as under:—Clerkenwell Exchange: First Aid, commencing Jan. 21, 1930, lectures 6 p.m.; Lecturer—Dr. Good. Central Telegraph Office: Home Nursing, commencing Jan. 16, 1930, practices 4.30 p.m., lectures 5 p.m.; Lecturer—Dr. Hellier. Money Order Department: First Aid, commencing Jan. 13, 1930, lectures 5 p.m.; Lecturer—Dr. Barnes.

Further information can be obtained from the following Branch Secretaries, Post Office Ambulance Centre: Miss B. L. Webb, Trunk Exchange, G.P.O. South, E.C.4; Miss A. L. Yetton, "K" Division, C.T.O., E.C.1; or from the General Secretary, Women's Section, Miss E. K. M. Meeser, Controller's Office, L.T.S., Cornwall House, S.E.1.

* * * *

The London Telephonists' Society.—"The Telephonist and the Press" was the title of a paper read by Mr. W. H. Gunston at the meeting of the London Telephonists' Society, held on Dec. 6, 1929. Despite the strong weather prevailing, there was a satisfactory attendance, including visitors from the Secretary's Office.

Although the letters published from time to time in the contemporary press state in no uncertain terms the opinion held by members of the public, it was quite evident that an insatiable curiosity gripped the members of this Society with regard to the light shed by the newspapers upon the telephonists of earlier days.

Mr. Gunston—materialised, no longer the remote being, mysteriously directing the *Telegraph and Telephone Journal*—gave a paper amply designed to satisfy the most persistent enquirer, and drew, out of the apparently inexhaustible storehouse of his knowledge, a fund of anecdote and commentary.

A debate followed, the speakers all expressing their appreciation of Mr. Gunston's paper, and, in conclusion, a general vote of thanks was warmly accorded.

We are hopeful that the paper will be published in the *Journal*, and we anticipate it will there give as much pleasure as it gave to those who had the good fortune to be present at the meeting.

* * * *

Telephone Broadcast.—The B.B.C. surprise item of Oct. 18, 1929, was in part relayed from Gerrard Exchange. Several rehearsals were held and those who actually took part quite enjoyed the novelty of broadcasting for the first time.

The Regent Dance which was in progress on the floor below added to the local interest so far as the B.B.C. staff was concerned, it also provided a pleasant entertainment for the Gerrard staff who were awaiting their turn at the microphone. An excellent loud speaker was kindly lent by the B.B.C. for the occasion and boxes of chocolates were presented to the "Gerrard broadcasting team" after the performance.

On the evening of Dec. 5 some members of the Gerrard staff were invited to visit the B.B.C. studio in order to see how everything was done at headquarters. The programme, which included the "Houston Sisters," was greatly enjoyed and appreciated by the party.

* * * *

Film Production at an Exchange: Gerrard, Dec. 5.—On arriving at the Exchange to-day we were dazzled by a row of brilliant lamps which were focussed on the switchboard for the purpose of a moving picture. It is understood that the film is for educational purposes, showing how the manual exchange is worked by human agency and shortly to be entirely replaced by automatic plant. The operating was, of course, carried on as usual for the purpose of this picture.

* * * *

Obituary.—By the death of Mr. Charles Diamond, which took place on Nov. 8 last, the London Telephone Service loses another link with the late National Telephone Company. Mr. Diamond entered the service of the Company in 1907, having previously served for 27 years in H.M. Army, and was a familiar figure at the public enquiry counter for a period of over 20 years. His unfailing courtesy to the public had often received commendation in high quarters, and the unruffled serenity of his manner in his dealings with the staff, under, at times, trying circumstances, made him a most likeable colleague. His death on the eve of his retirement has come as a sad blow to all who knew him. He leaves a widow and one son to mourn him in England, and two other sons in South America holding responsible positions in the San Paulo Telephone Company.

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LEEDS DISTRICT NOTES.

IT is not often that a modern telephone exchange is found housed in a building of historical interest. The photograph inset shows the Otley

OTLEY OLD VICARAGE, BUILT 1673 (WITH CHURCHYARD IN FOREGROUND). NOW A TELEPHONE EXCHANGE.

(Yorks) Telephone Exchange. The building originally was the Otley Vicarage and was built in 1673. A tablet in Latin over the back door sets forth this interesting fact.

An interesting communication has been received from Mr. Hancock, the late Postmaster-Surveyor, who celebrated his retirement in April last by going round the world. His journey has now brought him to California, after visiting South Africa, Australia and New Zealand.

Leeds Telegraphs.—Teleprinter Installations.—The installation of teleprinters proceeds apace at Leeds. The routes now equipped include London, Manchester, Newcastle, York, Lincoln, Preston, Hull Fish Market and Halifax.

Other circuits to be converted in the near future include Edinburgh, Sheffield, Grimsby, Bradford, Cardiff, Birmingham and Stock Exchange.

The London-Leeds Baudot circuit is the latest to give place to the teleprinter. The TS-LS 2 loop, which provided the conductor for the Baudot circuit, has been taken to provide one teleprinter circuit, while TS-LS 8 loop provides a second. The Stock Exchange TS-LS 3 loop has been taken to make up the third, whilst a fourth circuit until 4 p.m. daily is provided by means of an aerial line (TS-LS 9).

Identical conditions obtain on the three loop circuits, and after some preliminary difficulties in adjusting the local conditions these circuits appear to be stabilised. The margin of stability, however, is very fine, and occasionally difficulties have arisen with senders and keyboards on the long loop circuits which are not usually apparent on the shorter teleprinter circuits or on the London aerial circuit.

It is hoped that the success, which we have experienced with the teleprinters previously installed, will be continued over the London route.

By a strange and unwelcome coincidence Mr. J. O. Walker, the Exchange Superintendent, Bradford, and Mr. J. R. Sutcliffe, the Exchange Superintendent, Leeds, had to be operated on for appendicitis on the same night. They are both progressing favourably, but now hold the opinion that Christmas as a festive season is considerably over-rated. As Exchange Superintendents they have much in common in their official duties, but to develop appendicitis simultaneously appears to be carrying unanimity of action too far. Rumour has it that one of their colleagues who had been much in contact with them was observed to be scanning the catalogue of infectious diseases on his copy of form P. 777.

For Engineering and Traffic Officers the recurring gales made the nightly weather report the principal item in the B.B.C.'s programmes during December. The effects of the gales, though bad enough, were nothing like so severe in West Yorks as in the southern counties. A notable casualty was, however, the newly opened rural automatic exchange at Lothersdale, which was cut off telephonically from the outside world for a couple of days.

A new use for supervising officers is apparently contemplated by one of the night operating staff who, when asked to say why disciplinary action should not be taken against him in connexion with an operating misdemeanour, wrote in reply: "I do not see why action should be taken against me when there is an officer-in-charge for the purpose."

Television is not yet an established accessory to the telephone system, but an effect as powerful as that of television was obtained recently by the Managing Director of an old-established brewery in Yorkshire. Their new P.B.X., with extensions to all departments, had just commenced to function when he called up the storehouse. The storekeeper who answered the call was an employee of long and faithful service, and, recognising the voice of authority, he immediately took off his hat and said, "Good morning, Sir."

The telephonists of the Bradford Exchange held a very successful party at the Lidget Green Conservative Club on Friday, Dec. 6. Invitations were extended to all those who had left the service, and it was very gratifying to find that so many old members responded. Fancy dress was optional, and there were many pretty and original costumes. No prizes were offered for identifying "Mr. and Mrs. Buggins and Family," whose arrival caused quite a sensation, especially as it was found that "Grandma" had been mislaid on the way.

Time flew very quickly after supper was served, and it was soon 11 o'clock and time to depart. Everyone enjoyed themselves so much that we are hoping the "powers that be" will arrange to "repeat" the affair before long.

An Englishman has the reputation of being shy and reserved. We think it must be so. So many good folk who really should know better when answering their telephone calls manage successfully to conceal their identity under such uninspiring names as "Hullo" and "Yes."

An echo of the Christmas rush:—

Enquiry Office, Leeds G.P.O.—

"Is that the Post Office?"
"Yes, Sir."
"How long does it take a letter to get to South Africa?"
"What part of South Africa, Sir?"
"Winnipeg!"

Promotion.—It is pleasing to record that Mr. J. T. Hutchison, Contract Officer, Class I, has been promoted to Contract Manager, 2nd Class, Belfast.

Mr. Hutchison served his country in the great war. He was gazetted 2nd Lt., 5th Batt. Highland Light Infantry, January, 1916, seconded to the 2nd Batt. H.L.I. in France, September, 1916, and then placed on the Staff of the First Army, and promoted to Lieut. He was later promoted to Captain and served until January, 1921.

Mr. Hutchison will proceed to Belfast early in the New Year.

GLASGOW TELEPHONE NOTES.

"There can be no perfection anywhere, or in anything, where ladies are not."—(*Lever.*)

Our "picture-in-little" this month is of Miss Louisa Mortimer, Supervisor of the Douglas Exchange.

Miss Mortimer has had a long and varied service on telephone work. Commencing in July, 1893, as an operator, she has passed through all the various stages up to her present rank, which she attained in September, 1927. Her experience of operating methods includes magneto, call wire, call key lamp signalling and central battery working.

MISS L. MORTIMER.

Miss Mortimer belongs to that class whose activities are not limited to their main profession, and, in consequence, her services in many phases of life are frequently requisitioned, as they are cheerfully given. During the war she was an active member of the Red Cross Society and engaged in a good deal of hospital work. Her activities include mission and reclamation work among the poor children and the outcast, both in and out of prison. Miss Mortimer's principal recreation is the pianoforte, and even this she uses as a means of bringing some light and cheer into the lives of the sick and unfortunate in the infirmaries. We wonder how, in addition, she finds time to be a Committee member of the Civil Service Sports Council, and to have

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secured certificates for, among other subjects, examinations in physiology, anatomy, applied anatomy and sick nursing.

It is generally the busiest person who can find the time, and who is also willing to go "the second mile."

"*My Day's Work.*"—A very successful broadcast from all Scottish stations, entitled "My Day's Work," was made by Miss M. M. Ruxton, a Central Exchange telephonist, on Friday, Nov. 15. The broadcast lasted for about 20 minutes and gave a fairly comprehensive description of a telephone exchange and a telephone operator's daily work.

On the afternoon that Miss Ruxton was broadcasting Mr. Coombs was holding a telephone demonstration at Thornwood School, Partick, and the broadcast was heard by the scholars from a portable loudspeaker. The various parts of the switchboard were pointed out on the demonstration set as they were mentioned in the broadcast—surely a unique arrangement in the history of the telephone.

The broadcasting fee given by the B.B.C. has been handed by Miss Ruxton to charities.

The Western Exchange staff held their popular and annual Whist Drive in Dowanhill House on Nov. 14. The large company of 126 was representative of all sections of the Glasgow service, and included Mr. A. E. Coombs, District Manager, and Mrs. Coombs; Mr. E. J. Johnson, Traffic Supt., and Mrs. Johnson; Mr. J. Law, Chief Clerk, and Mrs. Law; and Mr. F. Lucas, Contract Manager. Thanks to Miss Isaacs and her band of willing helpers.

It is whispered that the Dee Emm revoked, that the See See played hearts for trumps instead of diamonds, that the See Emm secured his tricks by exercising upon his opponents his well-known powers of non-terminal facilities of speech, and that the Tee Ess broke all records for length of stay at one table.

On Thursday, Nov. 21, the Central Exchange staff entertained the patients of Bellahouston Hospital to tea and a whist drive. The party consisted of about 120, and a thoroughly enjoyable evening was spent.

Mr. Gallaghan, on behalf of the men, expressed appreciation for the entertainment and said the patients would eagerly await "Central's" next visit.

On Resolutions.

"I am resolved to take up some rules and obligations upon myself to walk by . . ." "To my office, perfecting my vows for the next year, which I have now done and sworn to observe upon the respective penalties thereto annexed; but I fear I have a little too severely bound myself in some things. However, I know the worst, and shall perform or pay my forfeits punctually. . . ." "Thence to the pewterers, to buy a poore's box to put my forfeits in, upon breach of my vowe. . . ." "This day breaking of my vowe against my will, I am much troubled for it, but I hope to be forgiven. . . ." "My Lord Rutherford would needs carry me and another to a play. And here I must confess breach of a vowe in appearance, but I not desiring it, but against my will, and my oathe being to go neither at my own charge nor at another's, as I had done by becoming liable to give them another; but I neither know which of them paid for me, nor, if I did, am I obliged ever to return the like, or did it by desire or any willingness. So with a safe conscience, I do think that my oathe is not broke. . . ." "Wine was offered and they drank, I only drinking some hypocras which do not break my vow, it being, to the best of my present judgment, only a mixed compound drink, and not any wine. I do hope and do think I am not mistaken. . . ." (Sir Walter Scott said this was a piece of bacchanalian casuistry, matched only by Fielding's chaplain, who preferred punch to wine because the former was nowhere spoken against in Scripture.) "I end the month with some sorrow that I have not exactly performed all my vowes, though my doing is not my fault, and I hope to be forgiven for not forfeiting the £10 I promised. . . ." "This day my vows have expired, and so I do resolve to take a liberty to-day, and then to fall to them again."—(Pepys.)

Why make good resolutions at the New Year more than at any other time?

For the reason that it is a good sound habit to put oneself through a little examination now and then like merchants who take stock of their goods at certain periods. Surely we must stop at intervals to see how our life-pattern shapes, to mark where we can improve it, and to start again with renewed courage and hope. As an occasion for considering quietly whether we have enlarged our minds, strengthened our characters, raised our ideals and striven after them, the New Year is more suitable than any other. . . . Do not be discouraged by the thought that it is useless to make good resolutions because you are not likely to keep them. The lives of the best men are a continual record of failure; but they were the best men because they continually renewed their resolves. If you read the prayers which Dr. Johnson composed for the successive New Year's days of his long life, you will find that in nearly all of them he registers the same failures and the same resolutions. He never conquered his failures entirely, but he made himself the foremost man of letters of his time. . . . In the hands of every one of us lies the possibility of doing something to make the lives of others more contented, brighter, less of a dull grind. Let us resolve, then, for 1930, even if we fail, to be cheerful at home; to be kindly, thoughtful for others; considerate of those who work with us and for us and over us; courteous and pleasant in manners; just and temperate in rebuke when things go wrong; radiating cheerfulness and humour."—(A. B. Mann.)

"The true value of resolving, the indispensableness of it, is visible in its subjective efficaciousness. If resolutions made for an objective reward, such as the increase of our worldly prosperity, be acts of doubtful efficacy, it cannot be questioned that there is saving virtue in the expression of an aspiration towards the higher and nobler development of one's nature and in the humble contemplation of one's own littleness in the unthinkably vast scheme of the universe. In such resolving as this, and in the reverential attitude of mind which such contemplation induces, there is assured gain. We should never abandon the habit of resolving and of the contemplative attitude of mind. There are many ways of resolving which are futile, even to absurdity; but there is one way which makes it a gradual superimposing on our spirits of something higher and sweeter than was there before, which is not to be neglected or abandoned without the paying of a very heavy price. We shall not only stand still on the ladder of spiritual progress, but we shall also fall back from such steps as we have already made if we abandon the act and put away from us the attitude of this kind of resolving."—(Darley.)

"A generous vow is never made in vain; a resolution (for a particular gain) may fail, but the individual is always, I believe, rewarded by some gracious visitation."—(R. L. S.)

"I vowed to be of use on the earth, and to rise above my own wants and interests."—(Doyle.)

"Just resolve without desiring anything—just resolve—that's all."—(Gorky.)

C.T.O. NOTES.

Promotions.—Messrs. W. A. Lock, Superintendent Lower Grade to Superintendent Higher Grade; W. G. Godden, Assistant Superintendent to Superintendent Lower Grade; C. Buxton, F. W. Dare, Overseers to Assistant Superintendents; T. P. Willmot, R. Hain, S. J. Oliver, V. T. Jackson, Telegraphists to Overseers.

Retirements.—Messrs. A. J. Cherry, Superintendent Lower Grade, L. C. M. Rowan, Assistant Superintendent, E. Stobbart, Overseer (Cable Room), W. Beavey, A. Foster, E. J. Izard and A. T. Jay (Cable Room), Telegraphists.

Ambrose Applejohn's Adventure.—This play, presented by the Dramatic Section of the C.O.D.O.C. at King George Hall on Dec. 3 and 4, 1929, was highly successful from every point of view. According to the author, it is "An Arabian Nights Entertainment." It is colourful, full of lavish wit and complications, but on the whole it is difficult to look upon the play as anything but a farce.

In the name part Percy Loeber gave an outstanding performance. His acting as the "Pirate Captain" was polished in every degree. As Anna Valeska, Miss Maud Cadman gave a very creditable portrayal of an extremely difficult part. Bert Eagland, as Ivan Borolsky, was at first a trifle stiff, but improved as the play progressed. The Cabin Boy, or, rather, the quiet admirer of Ambrose, as played by Miss Ivy Turtle, was a delightful person—one could not understand the "blindness" in this respect of Ambrose Applejohn. The remainder of the cast were excellent, and although it is invidious to make comparisons, one cannot refrain from remarking that as Ambrose Applejohn Mr. Loeber excelled.

The next production of the Dramatic Section takes place at the Cripplegate Institute on Mar. 18 and 19, 1930, and the play chosen is "The Last of Mrs. Cheyney," by Frederick Lonsdale.

Our patrons should perhaps be reminded that in future all applications for tickets should be made to Mr. J. Henry, Pay Office, C.T.O., E.C.1.

Sport.—The cross-country season has opened well, 20 runners having taken part in the training spins weekly from "Jack Straw's Castle," Hampstead. The C.T.O. team obtained 4th place in the Civil Service Cross-Country Championship, which was run at Surbiton on Dec. 14.

Chess.—The first team have so far done very well, having beaten the Board of Trade II; N.A.L.G.O., L.N.E.R.; Stationery Office and Metropolitan in the Civil Service League and London League C.

Bowls.—At the Annual General Meeting of the Central Telegraph Office Bowling Club, J. Stuart Jones, Esq., M.B.E., in the chair, it was reported that the club had won seven out of eight matches played during the 1929 season. The only loss was to the Admiralty Club by two shots, 60-58, but this was sufficient to put the club out of the running for the "Bunbury" Cup, which was won by the Admiralty Club. The "Bunbury" Cup is competed for by clubs affiliated to the Civil Service B.A.

The officers for the 1930 season were elected as follows:—

President—Mr. J. Stuart Jones, M.B.E. *Vice-Presidents*—Messrs. A. W. Edwards, O.B.E., D. M. Ford, A. Faull, Commander E. L. C. Grattan, D.S.O., R.N., E. Cooper and G. T. Archibald. *Honorary Secretary*—Mr. T. G. Donno. *Honorary Treasurer*—Mr. G. J. Defoe. *Honorary Auditor*—Mr. A. Faull. *Captain*—Mr. T. H. Wright. *Vice-Captain*—Mr. W. A. Lock. *Committee*—Messrs. C. A. Butt, H. A. Songhurst, J. Wesley and C. T. Drywood.

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THE

Telegraph and Telephone Journal.

VOL. XVI. FEBRUARY, 1930. No. 179.

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TELEGRAPH AND TELEPHONE MEN AND WOMEN.

LXXII.—CAPTAIN E. C. LLOYD.

CAPTAIN EDWIN CORBETT LLOYD, Chief Superintendent of Telegraphs, Birmingham, the subject of our portrait, was born on Jan. 17, 1872. He entered the Post Office service at Birmingham as a Telegraphist, Class II, on July 23, 1886, and reached his present position of Chief Superintendent on Feb. 9, 1928.

To the older generation of telegraphists Captain Lloyd needs no introduction. He served on the Special Racing Staff from 1890 to 1910—a striking testimony to his ability both as counter-clerk and operator, when one recalls the high standards set for and demanded from members of the Racing Staff in those years. From 1910 to 1912 he was employed in the Trunk Telephones and in 1913-14 his activities were transferred to the Survey Branch. Among the earliest of the Controlling Force at Birmingham to volunteer for service in the Great War, he enlisted on Jan. 24, 1915, returning to civil life on April 12, 1919, having attained the rank of Captain in the Signal Service, Royal Engineers. He saw three and a half years' active service in France, was mentioned in despatches, and among the Post Office servants of all ranks with whom he was brought into contact during the war years he was a popular figure.

Captain Lloyd's post-war duties included a further spell of Survey Branch work, as Assistant Superintendent, an experience which later stood him in good stead when acting as Assistant Postmaster. He is interested in all outdoor sports, particularly cricket, and, in his younger days, was a safe and keen wicket-keeper for the Telegraphs Cricket Team. To-day, he seeks his recreation in motoring, of which Mrs. Lloyd (herself an old telegraphist) is also a keen devotee.

Thorough in everything that he undertakes, Captain Lloyd looks for the same standard of efficiency in his subordinates. Those who work conscientiously for him are assured of appreciation and encouragement; he gives short shrift to the slacker; and any case of distress among his staff is assured of prompt, practical and sympathetic treatment at his hand, once it is brought to his notice.

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THE TELEPRINTER.

A. P. OGILVIE (*Headquarters Traffic Section*).

(*Continued from page* 63.)

(III.)

Mechanical Features.—The essential parts of all tape Teleprinters are very similar. Referring to Fig. 4, it will be noted that a small motor, provided to drive both transmitter and receiver, is prominent. The transmitter itself consists of a type-keyboard with appropriate mechanism for selecting and signalling the

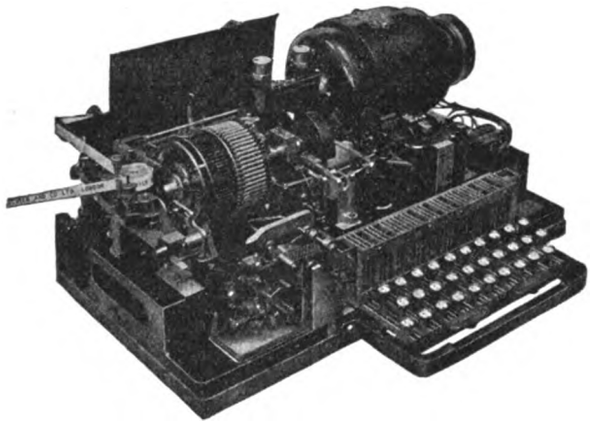

FIG. 4.

required character, while the receiver comprises a relay and associated mechanism for translating and passing on received signals to the printer which in turn records them in readable form on tape. The different parts are combined on a single base forming a compact portable unit, measuring in the case of the Teleprinter No. 3A, 20 inches in length, 18 inches in width and 10 inches in height.

FIG. 5.

A solid cover, partially padded inside with felt, encloses the unit and aids in reducing working noises to a minimum. The machine is comparatively noiseless in action, and, while in a small Instrument Room the subdued hum of the motor is audible, it is, to most ears, much less distracting than the clatter of morse sounders. At the larger offices the extended use of these machines is contributing materially towards a desirable reduction in Instrument Room noise, an improvement generally appreciated. The cover is hinged and opens backwards to facilitate tape renewals and for examination of the apparatus; it may also be completely removed vertically when necessary. The sloping front provides a convenient lectern.

Battery and power supply connexions are made by means of plugs and flexible cords attached to the machine, the plugs being inserted in corresponding sockets or jacks fitted on the instrument tables. A certain amount of movement is thus permissible when the position of the machine has to be altered for operating purposes, as, for instance, in simplex working. The replacement of a faulty machine is also facilitated.

Although three models of tape Teleprinters are still in use in the British telegraph service, development within recent years has been almost entirely confined to the equipping of public circuits with the Teleprinter No. 3A, which is now accepted as the standard machine. The details in the following paragraphs should therefore be taken as applying to the Teleprinter No. 3A, except where other models are specifically referred to.

Drive, Speed, and Coupling.—A motor of $\frac{1}{12}$-th horse power, usually driven from the electric light supply, forms the driving unit for transmitter, receiver, and printer. In Post Office practice this motor is kept running continuously and consumes over a period of from 12 to 14 hours about one unit of current. The speed is geared down to permit of the keyboard being worked up to a maximum of 60 words a minute. Actually, signals are always transmitted at a speed of 66 words a minute irrespective of the

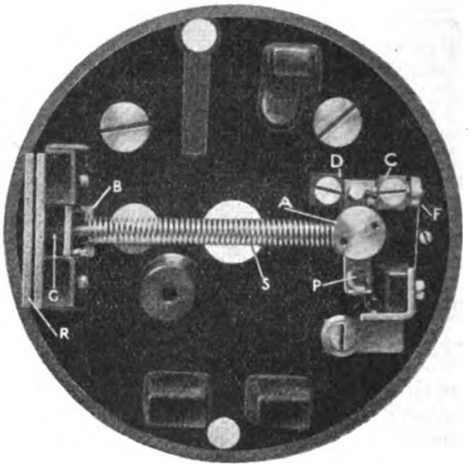

FIG. 6.

speed of operating, but even when the keyboard is worked at a maximum capacity, small losses occur between the keyboard and the transmitting point. Teleprinters may, of course, be geared to transmit at a higher speed, but 60 words a minute has been standardised as the speed most suitable for direct keyboard operating consistent with a minimum of mechanical wear and interruption.

To maintain a steady drive it is necessary to control speed variations by some device, and a governor, enclosed in a circular casing, is attached to the driving spindle on the right of the motor for this purpose.

The governor (Fig. 6) consists essentially of a spiral spring (S) fixed at one end (B) and attached at the other end to a moveable arm (A) carrying a weight arm pivotted at (P). When the motor is at rest the weight-arm is held against a stop (D) by reason of the pull of the spiral spring. Immediately the motor revolves and a

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certain speed is reached, centrifugal force acting on the weight-arm overcomes the pull of the spring allowing the arm to move outwards and strike a contact (C). This action short-circuits a resistance in the motor field circuit and causes the speed to drop. When this happens and the centrifugal force acting on the spring weakens, the weight-arm is pulled back, thus breaking the contact; the resistance is re-inserted and the speed again increases. These movements take place very rapidly and maintain an average speed corresponding to the setting of the spring and weight arm. Experience has shown that this speed control on the Teleprinter No. 3 A is not critical and that, provided the governor is correctly adjusted and the contacts are kept clean, it gives little trouble over lengthy periods.

An arrangement for verifying the motor speed is provided by painting a white spot on the inside of one of the gear wheels. A stroboscope, or vibrating reed, is supplied. The reed is made to vibrate by a flick of the finger and, as it moves from side to side across a slit in the stroboscope barrel, the spot on the revolving gear wheel is watched through the slit. If the speed is correct the spot will appear to remain stationary. If the speed is too fast the spot will appear to move in a clockwise direction, while if it is slow an opposite effect will be noticed. To obtain the best effect the stroboscope should be held near the top of the tube.

It is essential that the motor drive should be applied to the transmitter or the printer only when the operation of either or both is required; provision is therefore made for one spindle and clutch to operate the transmitter and another spindle and clutch to operate the printer, each acting independently. When no signals are being transmitted or received both clutches are disengaged and the mechanism is uncoupled from the drive.

Type-keyboard Transmitter.—Positioned transversely beneath the key levers are five combination bars with projections along their upper edge at infrequent intervals. These projections take up a position at rest between the key levers, so that when a key-lever is depressed it enters a slot between the projections and prevents those combination bars which have projections adjoining the depressed lever from moving to the right in response to the pull

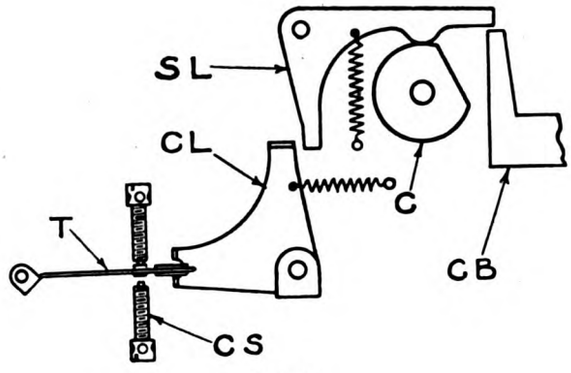

FIG. 7.

of spiral springs. One of the effects of putting a key down is therefore to permit some combination bars to move to the right while the others are held stationary. The permutation thus set up controls the movement of the transmitter tongue. Referring to Fig. 7 it will be seen that the left end of a combination bar (CB) takes a vertical form with the end under the top of a selecting lever (SL). When the cam sleeve (C) revolves the selecting lever tends to follow the contour of the cam by the action of the spring, but is prevented from doing so when the combination bar is in the position illustrated. In such circumstances the contact lever (CL) is not affected and the tongue (T) remains on the upper contact. Should, however, the combination bar (CB) be withdrawn to the right, the selecting lever will move, and its lower end will press on the contact lever (CL), which in turn will push the tongue (T) against the lower contact stud (CS). As the contact studs are connected to the positive and negative sides of a battery, signals of positive or negative polarity are transmitted via the tongue to the line and distant office. Five selecting levers rest in tracks along the cam sleeve in which the slotted cams are staggered. As the cam sleeve makes one revolution each selecting lever *in succession* follows, or is prevented from following, the contour of its associated cam according to the position of the relative combination bar. By this means the depression of a key first sets the combination bars for the appropriate character; then the combination bars control the movement of the selecting levers in the cam tracks; these movements are conveyed to the contact lever which ultimately determines the position of the tongue and the signalling of positive or negative impulses to line. It should

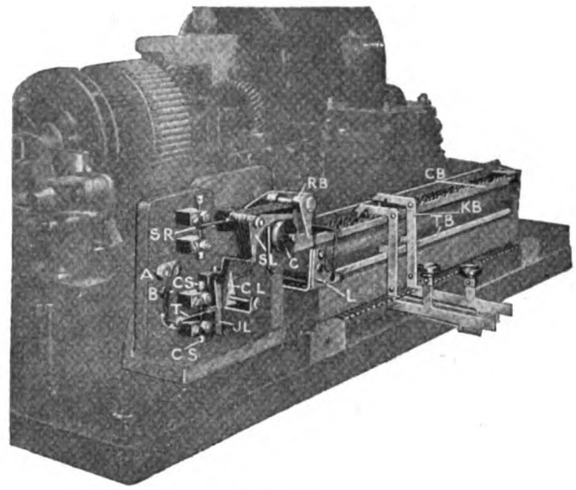

FIG. 8.

be added that a sixth selecting lever is provided for the transmission of the start signal. This lever has no combination bar to control it, and the start signal is transmitted automatically when the cam sleeve commences to revolve.

Concurrently with the setting of the signal combination, the depression of a key-lever actuates a trip bar. The movement of this trip-bar has the effect of coupling the transmitter cam sleeve to the driving spindle for one revolution when it is again disengaged. As may be seen from Fig. 8, the trip-bar (TB) is common to all key levers.

It will now be apparent that, during the rotation of the transmitter cam sleeve, the combination in process of transmission should not be disturbed by the premature depression of another key. To prevent this happening two locking bars are provided. One of these, set behind the combination bars, moves to the right when a key is depressed and a projection, entering a hole in the key lever, effectively holds the key lever down until the signal combination has been transmitted. At the same time the other locking bar positioned behind the key levers comes forward under the end of all key levers at rest and prevents their being operated until the key in action is released.

Operators who have not acquired a rhythmic style of manipulation may encounter the action of these locking devices if spasmodic fingering is attempted at a speed in excess of 60 words a minute. "Touch" operators, however, are taught to cultivate a steady rapid style of working just within the maximum capacity of the keyboard, which makes the provision of locking devices almost superfluous. From an operating point of view, the action of the keyboard is favourably commented upon generally.

(*To be continued.*)

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THE DISTANT CONTROL OF WIRELESS BROADCAST RECEIVERS.

B. S. T. WALLACE, C.T.O.

THERE must be many telegraph and telephone men who look upon a wireless receiver as something more than an electrical music box " which can be assembled in half an hour with the aid of a screwdriver and bring in 30 stations on the loudspeaker," as the alluring advertisements tell us, and who would be interested in the application to wireless reception of principles and instruments familiar to their own branch of the science of communication.

Wireless should be regarded as a public utility service to be made available in the home at every point it is likely to be required ; in the same way as gas, water, and electric light, with facilities for switching the valves on and off at all positions distant from the receiver. However simple and efficient the self-contained portable set may eventually become, there will always be a very large number of homes in which it will be desirable or necessary to receive the broadcasts simultaneously in more than one part of the house.

Before the days of general broadcasting the writer always made it a practice to place a wireless receiver in the best position available electrically, and take the output leads for the phones or loudspeaker where required. This can be done without any loss of efficiency, even in the simple crystal set ; whereas the extension of aerial and earth leads invariably causes reduction of signal strength. It is proposed in this article to detail principally :—

(1) The method of extending loudspeaker leads.
(2) The control of filament switching from the loudspeaker extensions.
(3) Wave change switching from loudspeaker positions.

After many years' residence in an old house full of cupboards and corners a sudden move had to be made to a smaller modern so-called labour-saving house, so perhaps a progressive description of the problems which arose and the methods adopted to meet them will best cover the points enumerated above.

Problem number one was a very firm refusal from the female members of the family to allow any wireless apparatus inside the house other than the loudspeakers and a switch to turn them on and off. They knew too well what those cupboards and corners contained, and that there was simply no room for it in the new abode.

This meant placing apparatus and batteries in a garden shed, and the situation was such that a wire or wires 120 feet in length would be required for loud speakers and filament control extension.

Experiments had previously been carried out successfully in practice whereby the output from the set and switching of the valves could be done on a single wire with earth return over a considerable length of line, but as it was not at first decided what methods of control would be adopted, a spare length of old bell cable containing three good wires was earmarked for connecting the shed with the house.

Inside the house, five loudspeaker points were required. Specially laid, concealed wiring would have necessitated the lifting of tongued and grooved floorboards—a rather unwelcome undertaking—and as an alternative it was decided to use the electric bell system which led to four of the points required. It is a great pity that present-day builders have not the common sense to wire rooms for loudspeaker extensions as a matter of course, as the cost is so small and the utility correspondingly great.

At this point the connecting of the loudspeaker to the output of a receiver, and the method of utilising the bell system for extensions, will be considered.

The one method better than all others of connecting a loudspeaker to the set, is the choke filter shown in Fig. 1.

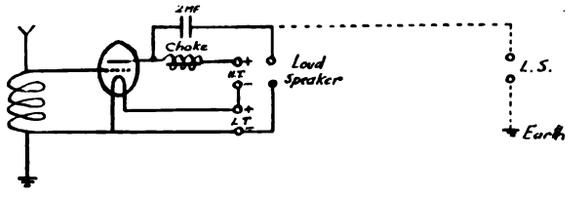

Fig 1. Choke filter output for loud speaker

The speech frequencies only pass from the plate through the 2 MF condenser to the loudspeaker and thence back to the filament. As the filament is invariably earthed directly or through a large condenser, it is evident that a single line can be taken from the condenser and the loudspeaker earthed at a distant point, as indicated by the dotted line in Fig. 1. This line can be of considerable resistance without materially reducing the volume at the distant end ; it can be extended for miles on a good air line without loss of volume or quality.

The method usually employed when working close to a receiver—of connecting the speaker direct to the plate and H.T. positive—should never be employed for extension work of any length. It simply invites trouble in all directions. For better reproduction, protection of instruments, and isolation of H.T. voltage, it is an advantage to use a choke filter at all times.

In most small houses the bell system from rooms to kitchen is either out of action or not required. There are many who would be glad to make use of it for wireless extension.

Fig. 2 is a diagram of the usual arrangement of indicator and house bell system. Fig. 3 shows the alterations necessary to operate a loudspeaker at either or all of four bell-push positions, leaving the front door circuit intact for ringing the bell.

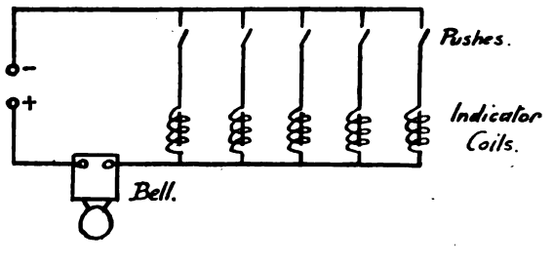

Fig 2. Diagram of common electric bell system.

The lead from each indicator must be disconnected on the push side where marked by a cross, and all the push leads bunched and connected to the wire from the output condenser of the set. This is a simple alteration, as the disconnexion and bunching can fortunately be done on the terminal plates inside the indicator. The opposite side of all the pushes are on a common line back to the battery, and it only remains to earth this line, or where necessary connect the return wire to it, at any convenient point.

An earth can usually be found near the battery and the appropriate connexion made to one of its terminals.

Care must be taken not to pass the speech currents through the electric bell or any of the indicator coils. These would act

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as chokes and seriously reduce volume. Alternatively: if any such electro-magnetic device is in the way, bridge it with a 2 MF condenser.

There may be a slight, almost imperceptible, reduction in volume at the loudspeakers connected to an extensive bell system,

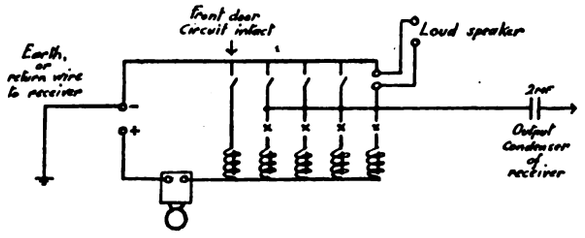

Fig 3. Bell system converted for loud speaker extensions

due to the capacity between the wires themselves, or the wiring and earth. The wiring is sometimes very badly done and may be useless. If twin bell wire has been employed it would be worth while trying to make some sort of insulation test between the wires before wasting time on it. Do not be surprised if you find it only measures hundreds of ohms instead of megohms!

The bell pushes can be dismantled and terminal plates, or better still, telephone jacks of the ceiling rose pattern specially made for the purpose, mounted in their place. The first arrangement used for distant filament control was to place the two remaining wires in the cable directly in the filament circuit and bring them to a tumbler switch in the house at one point only. (Fig. 4. The radio part of the diagram is a simplified theoretical circuit sufficient to indicate connexions.)

This method is quite satisfactory up to 150 feet or so, of wire, providing 4 or 6 volt valves are in use. There is, with these valves, sufficient margin for the slight voltage drop incurred by long leads, providing a good quality bell or heavier type of wire is used.

With 2-volt valves, direct filament extensions are not advisable. In fact: these valves are not a good electrical proposition at all. The resistance that occasionally develops at the valve pins or at dirty accumulator terminals is sufficient to reduce their efficiency considerably, and is a constant source of unsuspected trouble to the uninitiated. They were primarily designed to appeal to popular desire by making a second 2-volt accumulator unnecessary, but the economy is a very doubtful one.

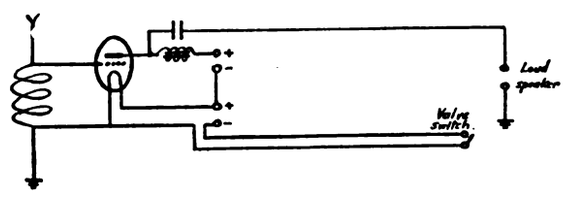

Fig 4. Distant control of valves by direct switching.

Direct switching leads could be paralleled off to all loudspeaker points and connected to switch jacks, together with the loudspeaker leads, so that the valves would only be alight while a loudspeaker plug was inserted. This method is satisfactory in a small way if well done, and there is no risk of varying conductivity at the jacks. Resistance loss *could* be compensated for by an increase of L.T. voltage and careful adjustment of it with a rheostat, but care must be exercised in case of unexpected variations of resistance in different branches of the extension.

The only trouble with this direct switching by an independent switch was the occasional omission to turn off the valves when retiring, and so leave them alight till the following evening or longer, to the detriment, principally, of the H.T. battery. This fact, coupled with the desirability of valve switching at each loudspeaker point, led to the installation of a system of automatic relay switching. (As only one wire with earth return was available, a simple method of direct switching by means of switch jacks, could not be employed.)

Fig. 5 is the method adopted, but it should be pointed out that two relays are not ordinarily necessary, as will be seen later. They were used in this instance—for reasons that will not be gone into here—because it was desired to operate the control from the speakers on a small fraction of a milliampere. Points that arise in the use of the two different types of relay are likely to be of interest, so the full arrangement will be described.

Choke C 2 is a low frequency isolating choke which effectively confines the output speech frequencies to the loudspeaker lead, though it will allow a steady direct current to pass. R 1 is a Weston moving coil relay operating on a current of a few hundred micro-amperes. The contacts of this instrument are too light to permit the closing of the filament circuit direct, so it is arranged to actuate relay R 2, a Siemens pattern of P.O. Standard A relay.

The current for both relays is taken from the filament battery and can be regulated to about 6 milliamperes—a negligible amount.

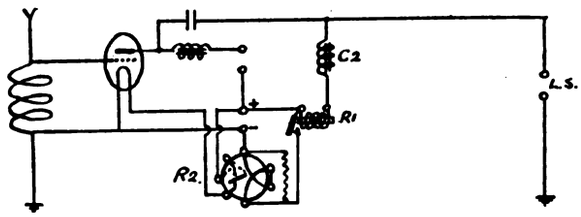

Fig 5. Automatic valve switching from a distant loud speaker

The provision of the shunt resistance of approximately 400 ohms across the windings of R 2, was necessary to prevent the cohering of the light contacts of the Weston relay, due to the back E.M.F. of the former when the circuit was opened.

The relays work with precision and certainty and give no trouble.

When all the loudspeakers, or phones (some say that with a single earpiece on the bed pillow the B.B.C. programmes are an aid to slumber!) are disconnected, the local circuits of both relays remain open and the valves and all batteries are cut off.

On connecting a speaker the path of the direct current is from positive L.T., through R 1, choke C 2, along the line to loudspeaker and earth, back through the apparatus earth to negative L.T. This actuates R 1, which in turn energises R 2, the local circuit of the latter closing the filament circuit.

As a current of up to about 10 milliamperes can safely be passed through the modern loudspeaker, it is evident that R 2 could do the operation direct if desired.

There is one point that will no doubt raise a query: the question of the grid bias battery sometimes necessary for the first valve of a receiver. In the conventional position this would be in the path of the relay circuit. It can, if desired, be removed from this path by the simple expedient of connecting the earth lead direct to L.T. negative, instead of the low potential end of the tuning coil. This may necessitate the use of a small by-pass condenser across the battery for the passage of H.F. currents.

In the writer's own circuit a grid bias battery is used in the normal position. As the relay current through it does not exceed .25 of a milliampere, no difficulty arises. If a heavier current of, say, 10 milliamperes, was used, a heavy type of bias battery would be advisable or the connexions altered as stated above.

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It might also be noted that in using two relays, a grid bias battery in the normal position would tend to send an opposing current through R 2, when the relays are in operation, but it is too small to cause any difficulty.

If necessary, the L.T. voltage can be increased for operating a relay, but, of course, care must be exercised not to include this extra voltage in the leads to the filament. The only limiting factor is the amount of current that can be permitted to pass through the loudspeaker.

Now that alternate wavelengths are in operation a demand has arisen for changing from one to the other, again by "simply turning a switch in the house."

Although hitherto everyone was quite content with the local station at its best, this new demand was necessitated by the requirements of an invalid who can never bear to miss either the news items or the church services, and apparently this type of transmission will be confined to one wavelength, and the purely entertainment matter to the other.

The two wires left spare in the connecting cable were utilised for wavelength switching. With an A.T.M. pattern of P.O. Standard relay, this proved to be a simple problem.

Fig. 6 is a diagram of the wave change arrangement only. The relay tongue is connected to earth and the two contacts each to the low potential side respectively of two tuning condensers; one tuned to the Regional wavelength, and the other to the National wavelength. The relay is set neutral with the contacts fairly wide open. A connexion from the split of the relay is taken to L.T. positive and so to earth. Two wires from the other ends of the relay coils are terminated in the house, each to one side respectively of two ordinary bell pushes, the other sides of the pushes being earthed.

The depression of a push completes the circuit via earth through one coil of the relay, throwing the armature to the spacing contact; the operation of the second brings it over to the marking contact and so connecting in the wireless circuit either the long or short wave condenser. Only a momentary impulse of current is utilised to make the change which is instantaneous and without complications beyond the provision of a second tuning condenser.

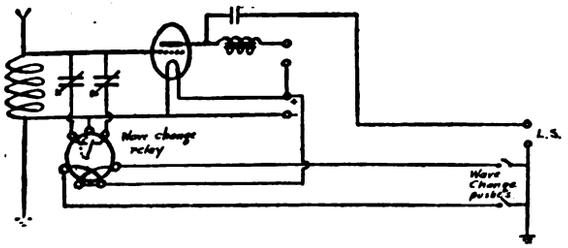

Fig 6. Wave length changing from distant position.

Multiple tuned circuits can be controlled in this way, the appropriate condensers being bunched on their low potential sides.

It is interesting to observe that the complete arrangements can be modified and the loudspeakers, valve control, and wavelength changing conducted over three wires or on two wires utilising an earth return.

Fig. 7 illustrates the three-wire arrangement, while the removal of the dotted return wire and earthing of the point E converts it to a two-wire system with earth return.

With these modifications it is necessary to have a split battery at the distant end to provide the momentary impulse for the wave change relay. This is conveniently supplied by two 4½-volt flash lamp units.

The wave change pushes can easily be repeated at a number of positions if one wishes to indulge in the luxury.

No haphazard earth will do when working over a distance with low voltage direct current, and even for a good wireless receiver it is well worth while to make sure of a really sound earth connexion. The less amplification required by means of the valves, the better the quality will be. One has only to listen to a five-valve portable set to realise this.

The earth used for the apparatus in the shed consists of about six square feet of zinc plates buried three feet deep, one side rammed against the clay subsoil, the other packed with fine ash. They

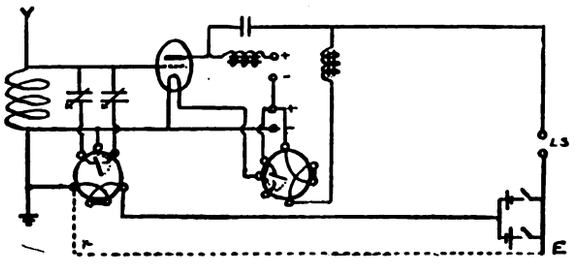

Fig 7. Loud speaker operation, valve switching, and wavelength changing over three wires.

are practically always in water as the overflow from a rainwater tub drains down to them. The resistance between this earth and the water main earth in the house is a small fraction of an ohm, and for wireless purposes the plate earth is the better.

The copper tubes usually sold for earthing purposes are not always satisfactory. Their contact area is too small, and in some clay soils they will corrode and rot away in a short time. Zinc plates should be used and care taken that any copper wire connected to them is well protected from direct contact with the soil, or local and electrolytic action will soon make a disconnexion.

The relays were obtained from war disposal stores, and there are still probably many more about. To purchase new they are expensive items, but it should not be beyond the wit of the manufacturers to turn out cheaply a simple and compact two-coil polarised relay with a figure of merit of 2 or 3 milliamperes suitable for switching operations.

Finally: it is hoped that this article will not convey the impression that the writer lives in a scene and noise like a battery of Creed printers.

The actual receiving apparatus consists of 2 valves, is designed for quality reproduction of the local station and employs no reaction. Together with the relays it is packed away on small six-inch shelves and forgotten. The loudspeakers are toned down so as not to interfere with those who do not wish to hear. To reduce volume at a speaker fixed resistances up to 20,000 ohms are placed in series with it. This method is simple and effective and does not interfere with the other speakers which may be in use.

FOR OUR ADVERTISERS.

The following contracts are open and all references should be made, unless otherwise stated, to the Department of Overseas Trade, London, S.W.1.: *Australia*, Melbourne, Postmaster-General's Department. Feb. 25. Jumper rings and terminal strips (Schedule C. 543) (Ref. B.X. 5941); also same date, Supply of switchboard plugs (Schedule C. 548) (Ref. B.X. 5998); also, same date, Magneto and common battery telephones and automatic dials (Schedule C. 544) (Ref. B.X. 5999). Egyptian Ministry of Public Works. Feb. 27. Supply and erection of H.T. three-phase, overhead transmission lines in Northern Delta of Nile. Specifications, &c., apply Chief Inspecting Engineer, Egyptian Government, 41, Tothill Street, London, S.W.1. (£10 5s. not returnable). J. J. T.

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MASS SUGGESTION.

BY F. G. LANE (*Reading*).

THE diurnal struggle for existence brought me, some time ago, to the house of a lady who had posted a card ("filled up a form" the *Daily Express* describes this) in order to make arrangements for a telephone installation—at under tariff rates, as I quickly learned. I was soon treated to a description of the business methods of the philanthropic institution which conducts the telephone service of Vancouver. (It was quite a refreshing change, by the way, to hear some other place than New York quoted.)

Experience prevented me from being surprised at the information that the tariff rate was $1.50 per month; but I confess that I was a little staggered when I was told that on the lady's return to the city after three years' absence, the clerk of the telephone company greeted her with "Good morning, Mrs. .....; I presume you would like the same telephone number as before!"

"Did he ask you to sign an agreement?" I foolishly asked.

"Oh, no, he just put my name in a book."

My tongue being by now well under control I did not ask why he did this!

We know well that it is convention which prevents a public servant from calling a well-bred lady a liar, or even from humming the air of "Tell me the old, old story"; but the reason why a well-bred lady claims the protection of convention and tells such palpable falsehoods is a little more mysterious. The reason is not, however, very abstruse: there exists a force which incites people to describe public men they've never heard and never seen as rascals, or newspapers they've never read as "rags." I am calling this force (not very originally) "mass suggestion."

The propagation of suggestion to the mass is daily craft of the journalist in concert with the circulation-pusher, and it is becoming so much a habit to use the telephone service for practice that the thing is growing on us like some unpleasant fungus.

The ball is set rolling by an article containing, perhaps, the truth, the half-truth, or anything but the truth, but couched in terms vaguely suggestive of something wrong. The "head-line mentality" then comes into play and there follow letters to the Editor, neither truthful or useful, contributed usually by modest persons employing "noms-de-plume." More articles and letters (even ordinary relevance is by now losing its importance) and, as the suggestion gathers way, contributions come in from quite well-known (but sadly misinformed) people, and so on *ad infinitum*. It matters very little once things are going well whether these letters are actually accusative or not; the newspaper knows that properly managed the effect is just the same.

The Editor of the *Journal* recently expressed surprise at a letter which read "I am giving up my telephone because I can no longer stand the persecution of its bell." What value had this rubbish to the criticising newspaper? What connexion had the curiously egotistical outpouring of some neurotic with a condemnation of the Post Office Telephone Service? Precisely the same connexion that the incident of some unhappy being putting his head into a gas-oven has with the "iniquitous" procedure adopted by gas companies of enriching coal gas with carbon monoxide. Nevertheless, in a recent newspaper attack on the gas industry, the gas-oven suicides always found prominent place with powerful denunciations of the use of water-gas. And the journalist knows his job as well as anyone.

This water-gas stunt, it may be mentioned, gave us some of the best examples of the newspaperman's craft and the propensity for growing and diffusing characteristic of suggestion.

Apropos of a minor disaster caused by a faulty gas main, we were enlightened as to the employment of water-gas. This gas (practically carbon monoxide), we were told, was a deadly poison and *odourless*. Perfectly true; but what was omitted were the essential facts that the smell of coal-gas when enriched with water-gas was almost unimpaired, and that even if the process were entirely dispensed with, free coal-gas would hardly be less dangerous.

Letters followed asking what dire effects (the writers would like to know) this water-gas had on food cooked in the gas oven. The *Encyclopædia Britannica* informs me (as it would have informed them) that carbon monoxide burns readily and in doing so becomes carbon dioxide. Thus their Sunday joints were made no more poisonous than soda water.

Then apropos of nothing followed the inevitable:—"Lover of Justice" wanted to know how the company could honestly accuse him of having consumed 20,000 cubic feet of gas, when it was patent to the world that his consumption was only 15,000 cubic feet. "Fairplay," it appeared, was to all intents and purposes in the same plight, and demanded to know what "Therms" had got to do with plain people like himself. And so it went on in the way we all know so well, and very effective it was, too—from the newspaper's point of view.

The gas industry is better off than we are. Though the suggestion assumed such proportions that large masses accepted as a self-evident proposition, the implied "fact" that the companies, as a matter of course, falsified their meters (such is the power of suggestion), the industry troubled hardly at all. It erected more eyesores in the shape of gas-holders, because we had to have gas, though the meter went like a merry-go-round.

It is obvious that with us it is different, and it is dangerous merely to treat the matter with the contempt it admittedly deserves. The only excuse for doing this is to imagine that mass suggestion is ultimately ineffective. I say "imagine" because such an attitude is worse than that of an ostrich, for an ostrich does not bury its head in the sand!

If anyone really does doubt, witness an advocate for handing us over to a public utility company, who says that the essential difference between the Post Office and such companies is that the former waits for customers whilst the latter goes out to look for and serve them. Then note that it is doubtful if the Communications Company will continue the canvassing practice of the Post Office. And when, gentle reader, did you last receive a visit from the railway company begging to serve you, or the representative of the gas company, seductively asking you to install a gas fire in your bedroom? In this case we see suggestion able to affect one in such a way as to cause him to violently assert something which he should well know is the reverse of actual fact.

If we are going to admit (as indeed we must) the effect of suggestion on the minds of well-known public men, we should automatically see that something must be done to stem the flow of this pernicious propaganda.

At once the most fascinating method of doing this comes to one's mind—that of setting in motion the law of libel. This is indeed most attractive: we see an annual revenue of close on twenty million sterling being seriously affected by gross misrepresentation, and dream of the crushing damages falling with fearful force on the slanderer. There may be something in this; but it is feared that expert opinion would say that such action *is* only a dream. In such a matter a public service is unfortunately placed, its position being in no way comparable to an injured private individual. It is a curious fact that whilst any number of falsehoods may be spread abroad anent a public body, the achievements of

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public research or the like, it is dangerous to tell even the truth about, say, a patent medicine.

It seems clear that the only means to handle them is by way of advertisement—advertisement in the broadest sense of the word. Something must be done to cut right across the evil suggestion; to make it clear that the telephone service in New York is not free of rental (I can state positively that the idea that it is is not uncommon) and that the Post Office has no substantial objection to London having as many telephones as Chicago. Admit that details of accounts are entered in the District Manager's books (a recent article in the *Daily Express* told everyone this "curious" fact) but show at the same time that, appearances notwithstanding, even Mr. Drage does it. Confess, too, that engineers have to erect poles and lay ducts (the *Daily Express* gave this secret away in the same article)—they are not *wireless* telephones and even Beecham's Pills are packed in boxes!

To carry on further than this, it is necessary to have in mind what is behind these perennial defamatory articles. It is, of course, a suggestion thrown to the public mind that the service is conducted ultimately by a host of irresponsible officials (the "mandarins of the Post Office" they are called), who look on the public with haughty disdain over vast entanglements of red tape. Once freed from such blundering incompetence (they do it on purpose!) and placed in the hands of a private monopoly all would be well. With regard to the first suggestion, it is, of course, rubbish, and what follows isn't much better, containing as it does a proposition unproved and unprovable. It may be observed here that the newspapers find it necessary to adopt Mons. Coué's repetitive methods—the suggestion is not well-founded enough to be self sustaining. But it is useless to discuss and argue; against the suggestion must be aimed the counter-suggestion—straight at the roots of the libels.

Some years ago, in a street in Auckland, N.Z., I observed attached to a waste receptacle the following notice: "This city belongs to you. Keep it clean." What a spirit to apply to the telephone service! Take an interest in the service: it is yours! The "officials" only own it to the same degree as you! The only difference being that they are bound to take a professional interest in it on your behalf and (don't forget) for the man next door!

We shall never effectively counter mass suggestion by concentrating on perfecting the service, however essential endeavours in that direction are. Perfection is a comparative attainment, and even if we approached some limit of *human* perfection, the libels would not cease. Any newspaper leader-writer could rake any industry fore and aft with criticism if there were any *motive* for doing so. Couldn't anyone rave at the apparently amazing stupidities of the railways or fill a book with his hopeless endeavours to transform the local grocer into an ordinarily rational individual. Surely, already we can say, with all modesty, that we are not so far from the general level of perfection as to invite such a fearful torrent of abuse.

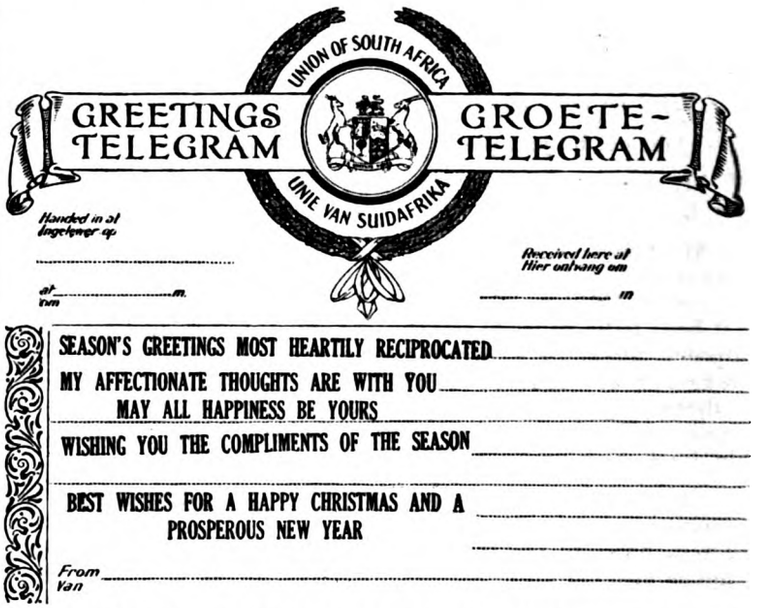
Let us start our counter suggestion—in our letters, our speech, our offices and kiosks—everywhere—and emulate the spirit of the citizens of Auckland.

An idea has been expressed that monopolistic enterprises have no need to advertise. Nothing could be further from the truth—we have to be taught to appreciate things and feel the lack of them. Few of us were born with a taste for pictures or music, or for grape-fruit—these things were "advertised." True, as a monopoly, we have enormous advantages and can effect considerable economies in advertising; but, apart from the necessity of maintaining counter-suggestion, we have new suggestions to make ourselves. It is well to remember that we are sometimes in competition. The telephone in the home is a labour-saving device—there are others. I have known a man in a rural district who hesitated between having a telephone installation and electric light!

CHRISTMAS CARDS BY WIRE.

SEASONAL TELEGRAPH TRAFFIC IN SOUTH AFRICA.

THE Christmas telegraph traffic in South Africa, which we noted last year as being very heavy, continues to grow, and the volume handled this season was greater than ever. This heavy traffic is due to the popular custom of sending seasonal greetings by wire, and was stimulated this year by the introduction of the new "Greetings Messages" service. A "Greetings Service" of a sort had already been in operation for a few years and provided for messages of a "seasonal" character to be sent at a cheaper rate for delivery by post, but it did not "take on" to any extent. This year, following the innovation of the "Greetings Messages" for the Jewish New Year, the service was put on a different footing, with satisfactory results and every prospect of a greater expansion in the future.



(*In this illustration the different forms of greeting are pasted on one form.*)

The underlying idea is a "Christmas card by wire," and the operation of the service, briefly, is that from Dec. 20 to the 31st, telegrams on special "A" forms, with a variety of greetings in both official languages—English and Afrikaans—under various index letters, were accepted. The charge was 3*d*. for the greeting, plus 1*d*. per word for the address and name from, with a minimum of 9*d*. as against the ordinary minimum of 1*s*. 3*d*. The messages were signalled as traffic permitted under a special prefix "GM," followed by an index letter to denote the greeting, the usual preamble, address and name from. No text was signalled. Special "C" forms of a fancy design on which the appropriate greeting on a printed slip, gummed, were used. This slip harmonised with the tape from the machine-worked circuits and the typewriting from other circuits, but even when the address, &c. was in manuscript, the Christmas card appearance of the received message was preserved. The "C" form, which was folded and required no envelope, was delivered by post. An illustration of the forms with specimens of the greetings is reproduced.

Although in some centres the new messages did not appeal as much as in others, yet, on the whole, the scheme was a success, it being estimated that over 30,000 of this class of message were handed in. And while it may be unduly optimistic to think, as

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has been said in at least one quarter, that the day of the Christmas card in South Africa is over, there is no doubt that in coming years the results of the scheme will increase and make the Christmas traffic bigger than ever. It also opens up possibilities for the telegraphs in regard to other festive and special occasions.

The following figures indicate the proportions the traffic reached this year. At Cape Town and Johannesburg, the two largest offices with average daily traffics of about 17,000 messages, no less than 67,000 and 73,000 were handled on Dec. 24, as compared with 63,000 and 59,000 respectively last year. At Durban, the third largest centre, a total of 26,000 was transmitted against 20,000 in 1928. Other centres were, of course, in proportion, and though the pressure is felt for some days before Christmas Eve, that day is the "field day" with almost fourfold the number of normal transactions. Such a state of affairs is cheering to the Telegraph man in these somewhat dismal days.

E. E.

TELEGRAPHIC MEMORABILIA.

Now that the damage to the North Atlantic submarine cables due to the earthquake off Breton Island on Nov. 18 has been more exactly assessed, it is calculated that the cable companies concerned have had to replace no less than 600 miles of cable in order to restore the broken sections. Seven cable ships have been at work in the disturbed area for at least a couple of months, and the total cost to the companies, says *The Times*, is well over £100,000. On the 1st ult. the Commercial Cable Company's London manager received the news that only then had the *first* of its three broken cables been re-established. Seven times this cable was brought to the surface and dropped again before it was possible to make a permanent joint, 40 miles being necessary for the purpose, so badly had the sea-bed been disturbed and the cable dragged, buried and torn from its original position.

The two Imperial cables were also interrupted, and in this connexion it is curious to relate that a cable-ship, the *Cambria*, normally employed in tropical waters, was hurried to the scene, but the severe weather and the low temperature of this region handicapped repairs to such an extent that the ship had to be fitted throughout with steam heating and its West Indian crew repatriated and replaced by men more used to the severity of northern latitudes. Several of the original crew suffered from frost-bites. While the change-over was being made the Cunarder, *Ansonia*, was loaded up with 150 miles of new cable and hurried from Southampton with, to a Cunarder, its novel cargo. It would appear that this portion of the Atlantic will need a new and thorough re-survey, as the seismic disturbance has completely altered the contour of the ocean bed over an area of probably 200 square miles. The differences already noticed in depth have been well over 40 to 50 fathoms.

It is not a little satisfactory to learn from a report of the British Commercial Secretary at Brussels to the Department of Overseas Trade, London, that the Annual Radio Salon which took place in the Belgian capital from Oct. 12 to 21 last was not only a success as a whole, but that the British exhibits stood out well above the heads of both local and foreign productions alike in range and quality.

Considerable concern has been expressed in the U.S.A. recently at the effect of the White Act of 1927, which forbids the purchase of a wireless company by a cable company and *vice versa*. According to *The Electrical Review*, General J. G. Harbord, President of the Radio Corporation of America, stated that the recent successful effort of the British companies to consolidate their cable and wireless interests "is a serious challenge to the wireless supremacy of the United States, which is more important to the United States than oil or the merchant marine." . . . "American trade," he maintained, "cannot but be profoundly affected in every quarter of the globe."

The Senatorial enquiries into this matter of the radio, telegraph and telephone monopolies commenced about a week after the above declaration, when Mr. Owen D. Young, Chairman of the same Corporation, advocated "the unification of the American wireless and cable telegraph communication systems in order to meet foreign competition," before the Senate Inter-State Commerce Committee. He declared that it was impossible for competitive companies in America "to meet those consolidated units in other countries from the standpoint of national interest." This, according to Reuter's Washington Agency, Mr. Young maintained, was because Great Britain and France had already introduced unification, Germany was doing so, while Italy and Japan had unified their services under Government control.

Speaking on the same subject a month later, on Jan. 8, General Harbord is reported by the New York Exchange Telegraph as saying that "Government-controlled consolidation was highly desirable from a national safety point of view in the event of hostilities!"

Snapshots all round the World!—ARGENTINA.—There are now 203,502 miles of telegraph wires in operation in the Argentine, equal to 19.1 miles per thousand of the population. There are also 204,500 telephones in use, equal to 19.2 per thousand inhabitants! BOLIVIA.—In Bolivia there are only 6,986 miles of telegraph wire, or only 2.7 miles per 1,000 inhabitants, while the telephone only gives seven-tenths of a telephone to be divided between each thousand of the population! DENMARK.—The new Broadcasting Bill before the Danish Parliament—possibly by this time an Act—extends the period of office of the 15 Broadcasting Council from two to four years. FRANCE.—It is hoped that France will shortly have a wireless police service, providing rapid communication between Paris and the provinces. By direct wire to the Eiffel Tower, says *The Electrical Review*, the French *Sûreté* will be able to transmit descriptions and also photographs and finger prints. Fifty-one provincial receiving stations will be established. GERMANY.—Berlin announces that the Deutsche Bank there was recently saved the loss of £12,500 by means of the wirelessed picture of a bill which was compared with that presented by a forger. From the same city, however, the *broadcasting* of *still* pictures has received but very poor support and has led, it is understood, to the decision to terminate the experimental transmission of this type. GREAT BRITAIN.—The foregoing paragraph on "still pictures" is not to be confused with the photo-telegraphic service between London and Berlin inaugurated on the 7th ult., which had a successful opening and is now upon its trial. The system in use is known as the Karolus system, and was described on its broad principles with illustrations in the *T. and T. Journal* of March, 1927, Vol. XIII, No. 144. An illustrated, clear and concise article on "Picture Telegraphy to Berlin," also appeared as recently as the 10th ult. in *The Electrician* of that date. JAVA.—It is reported that the Dutch wireless station on Long Island, in the Java Sea, has been destroyed by fire. PARAGUAY.—Reuter's Trade Agency states that a local Asunción company has received permission to erect and operate a modern radio-telegraph station at Asunción for international service within 12 months of the date of the permit. RUSSIA.—A large new central laboratory for research work in long-distance telephony and telegraphy has lately been completed in Moscow. SPAIN.—The laying of a new submarine telegraph cable between Emden (Germany) and Vigo has recently been completed by the German-Atlantic Telegraph Company. U.S.A.—The Ford Motor Company is organising a wireless communication company, chiefly to link together the various Ford interests at home and abroad, so says Reuter's Detroit branch. The same agency reports that one of

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five new questions which will be put to householders in this year's United States census will be "Do you possess a radio set?" URUGUAY.—This South American republic, if it cannot beat Argentina, at least it comes first as regards Bolivia, with 3.7 miles of telegraph wire per thousand persons and 15.7 telephones! VENEZUELA.—It is stated by a Caracas agency that it has been decided to add a number of new short-wave radio-telegraph stations to amplify the services at Caracas, Maracay and Marquetia. Eventually, further extensions will be made at other points.

A Wireless Aniversary.—It is with regret that the writer of these notes omitted to record the fact that Dec. 12 last was the 28th anniversary of Marconi's reception at St. Johns, Newfoundland, of the first wireless signal to be received across the Atlantic Ocean.

Personal.—Among the recent promotions in the C.T.O., possibly none is likely to prove more unanimously popular than that of Mr. E. Colliver to the position of Asst. Supt., Telegraphs. Despite physical disabilities, which would have daunted many, other men, Mr. Colliver has rendered especially valuable service to the Department for years past in connexion with the working of printing telegraphs, and has never spared himself in so doing. Among those who have recently retired from the service upon reaching the age-limit one notes yet another of the late Submarine Telegraph Company's staff in the person of Mr. A. Jay, whose obliging nature and general willingness to help leaves a real gap in the ranks which will be felt for some considerable period. The same remarks in every detail also apply to the retirement of Mr. George Matthews, also formerly of the "Submarine."

Obituaries.—The death is announced on Dec. 30 last of Mr. Henry John Andrews, late of the Indo-European Telegraphs, Persian Gulf Section, at the ripe age of 80 years.

Also that of Mr. L. H. Tinson, formerly of the Inland Telegraphs C.T.O., who retired in 1921, after reaching the rank of Asst. Supt. I and Officer-in-Charge of the Telegraph School. Mr. Tinson was apparently quite well on Boxing Day, but passed away at Deal early on the 28th from heart trouble and was laid to rest at Southgate on the last day of the old year. Quite a number of old colleagues attended the funeral.

Also Mr. Harry Hopwood at the ripe age of 81½ on 16th, who took service with the Magnetic Co. 1861, P.O. 1870, Superintendent 1902. Retired 1906. He was for some years on House of Commons staff.

The close of the year also signalled the passing over of Mr. W. Meyer, of the Cable Room staff, after an illness which commenced as far back as August last. He was buried in the quiet churchyard of Freshwater, Isle of Wight, to which seaside town he had moved upon retirement several years ago. Although time and distance did not permit of personal attendance, it is satisfactory to learn that Mrs. Meyer and her family were not forgotten by "Bill's" old friends and colleagues, by whom his memory will always be a happy reminiscence.

Yet another death is that of the much regretted Tom Boulden, who, despite the services he had rendered to his colleagues in the P.T.C.A. days and on the deferred pay question, and probably because of his retiring and unselfish nature, was little known to the present generation. R.I.P., dear old friend and colleague, who feared only one thing—and that, to do the mean or underhanded thing!

Partings!—"Friend after friend departs.
Who hath not lost a friend?
There is no union here of hearts:
That finds not *here an end.*"
—*J. Montgomery.*

J. J. T.

NON-COMPETITIVE ADVERTISING.

COINCIDENT with the publication of the issue for December the writer had just prepared an item which, strangely enough, opened in very similar strain to the summary of a paper compiled by Mr. H. E. Powell-Jones, who made use of the slogan "Eat more fruit" and its effect on the trade as a whole.

As Mr. Powell-Jones implies, we are not advised as to who supplies the best bananas or brazils; the slogan being the outcome of the tendency for firms to combine in an effort to stimulate trade. Producers, purveyors and manufacturers, in many instances, contribute to the common fund of an association with this end in view. Their courage has been rewarded. A market is created and maintained.

Advertising has always been associated with competition, but the above process has proved to be responsible for a tremendous impetus to the trades concerned. It was found that the proportion of customers for each individual firm greatly increased, whilst their respective advertising expenditure has been reduced by about 20%.

Whenever it is desired to alter or induce a point of view this method of advertising has a startling effect.—We have no less an authority than Sir Charles Higham for those italicised words. He states that firms battle with their rivals far too much to-day; if they win fresh custom mainly from competitors, they are content. But a combine battles solely with the public, thus winning new business for all the firms composing it.

Unfortunately, the department is not at liberty to expend a sum that it would probably desire in promoting publicity. Even if it were, there are no competitive firms with which the Post Office may associate to ease the expenditure in like fashion to groups of firms. But there is this similarity; the latter can very favourably be compared to a monopoly.

Mr. Powell-Jones is not, of course, connected with fruit; but telegraph people, already regarding the telephone as a contributory factor to the demise of their craft, must have felt a tinge of regret at the entire omission, even in a comparative sense, of any reference whatever to what might eventually be an extinct volcano (not the stick of a dead rocket), should the value of publicity be ignored, or the idea toyed with.

The other day a beautiful catalogue came to the writer's house. Much money must have been spent in compiling the brochure. It was a work of art, and a feast for the eye. But the covering envelope! Having spent an enormous sum on the contents, the firm thought to save a few shillings by posting at circular rate and purchasing covers that even those cockney "Tommies" would have been ashamed to use. The psychological effect of this parsimony is really surprising. Generally speaking, the public are dubious of circulars, and when an unsealed halfpenny-stamped flimsy oblong arrives, there is no doubt as to the contents. The whole is immediately consigned to the waste-paper basket or thrown in the fire. An impression of something important (but not an income tax demand!) should be conveyed. Let the recipient imagine he is a very favoured person before he opens the missive.

It has been hinted in previous items that there is still a big field for the future development of the telegraphs, no matter what systems may happen to be in vogue. If ever television takes precedence, the problem will not be how to reduce delay, but how best to utilise the intervening periods of inertia (of which, more anon). The installation, however, will be there, and probably waiting to "eat up" the work at many lengthy intervals, throughout the day. The scope for obtaining more "food" will also be there, but the latter will not come of its own accord. It must be attracted by the persistent pummelling of publicity.

The results obtained from the demand to "Eat more fruit" explode the theory that the word "monopoly" is sufficient to create the desired effect on a particular trade or service.

W. T. L. (C.T.O.).

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THE POSTMASTER-GENERAL GIVES SOME INSIDE VIEWS OF THE POST OFFICE.

THE Lecture Hall of the Hampstead Garden Suburb Free Church was crowded on the 16th ult. on the occasion of the Annual Soiree, when Mr. Lees-Smith gave what he modestly called a "chat" on some of the activities of the Post Office as he had experienced and grasped them during the short time he had been in office. His remarks were freely interspersed with lantern slides, and to those who know something of the work of our great organisation, those observations gave evidence of the earnest application of our present chief and at times, even, the evident surprise of the speaker himself at the smoothness with which the huge machine moved, and the unostentatious manner in which each branch performed its duties to the State. Telephonists especially should be grateful to Mr. Lees-Smith for the plea he put in on their behalf to members of the public for a little patience at times of peak-load, when the operators are doing their best to carry out what he termed their "distracting duties." The postman, the sorter—especially the travelling one—the lineman, the men on the cable-ship, the Post Office engineers and their wonderful work at Rugby, with its wireless telephony ramifications, all came into review. The Post Office underground robot railway was also ably explained and illustrated. As Mr. Lees-Smith undertook to deal with but two of the chief activities of the Post Office, the Postal and Telephonic—each one in itself an evening's task, one can confidently affirm that he deservedly received the hearty vote of thanks and congratulations,—ably voiced by the Rev. W. Major Scott, who presided,—and which were unanimously and with acclamation accorded him.

J. J. T.

THE PROGRESS OF ELECTRICAL COMMUNICATION IN INDIA.

QUITE apart from the steady advances made with electrical traction, especially on heavy gauge lines in the Bombay district and over the Ghats, it is deeply interesting to note from time to time how surely yet unostentatiously the telegraph and telephone communications of India especially are marching ahead.

This is specially the case with long-distance telephony. Apart from the statement of a Calcutta newspaper that its representative at Karachi had a conversation on Aug. 2 with a *Daily Mail* reporter in London "by telephone over the Indo-European *telegraph* line," concerning which *The Electrical Review* remarks that, "in the absence of details it is not clear how the communication was effected," there is sufficient evidence that long-distance telephony, for example, is an accomplished fact. If, as is the case, telephone communication between Landi Khana, on the Afghan border, and Bombay is a regularised communication, then one may be confident that once Europe is able to get in telephonic touch with India, extensions to most of the important centres, not excepting Madras, and eventually Burmah will be well on the way to realisation.

At present the United Provinces, the Valley of the Ganges, from Calcutta to the North-Western Frontier, are all telephonically connected with Bombay, and extensions are now being made southwards, though the financial incentives to develop in that direction have not the urge of the more northerly districts mentioned.

One of the most hopeful signs would appear to be found in the report of the Indian Institute of Science, Bangalore, which emphasises the considerable progress made in electrical equipment and electrical research there. A direction-finding house has been built for research in telegraphy and telephony. A Creed keyboard perforator (possibly a footprint of friend Creed during his last visit !), a Wheatstone high-speed automatic transmitter and a Strowger-type automatic telephone set—10,000-line system—have all been added to the engineering section. That the Institute is no mere theoretical college the directorship of Professor Catterson-Smith ensures, and mention of but a few of the investigations carried out will supply full confirmation; thus, power losses in dielectrics at high voltages and normal frequencies have been examined and censured; the behaviour of insulating oil at varying temperatures, with special reference to losses near the breakdown voltages, has been carefully recorded; daily observations of the carrier-wave strength from the Bombay broadcasting station, &c., &c.

The engineers of the near future, thus equipped, should be well able to cope with their day-to-day duties, not to say deal with unforeseen problems.

J. J. T.

PROGRESS OF THE TELEPHONE SYSTEM.

THE total number of telephone stations in the Post Office system at Nov. 30, 1929, was 1,837,045, representing an increase of 14,055 on the total at the end of the previous month.

The growth for the month of November is summarised below :—

	London.	*Provinces.*
Telephone Stations—		
Total at Nov. 30	657,304	1,179,741
Net increase for month	5,472	8,583
Residence Rate Subscribers—		
Total	160,342	252,063
Net increase	1,728	2,573
Call Office Stations (including Kiosks)—		
Total	5,780	23,780
Net increase	34	422
Kiosks—		
Total	1,539	5,865
Net increase	24	81
Rural Party Line Stations—		
Total	—	10,353
Net increase	—	—
Rural Railway Stations connected with Exchange System—		
Total	17	1,390
Net increase	—	92

The total number of inland trunk calls dealt with in September, 1929 (the latest statistics available) was 9,757,670, representing an increase of 897,582, or 10.1% over the total for the corresponding month of the previous year.

The outgoing international calls in September, 1929, numbered 44,011, and the incoming international calls 47,636, representing increases of 9,493 (27.5%) and 10,232 (27.4%) respectively over September, 1928.

Further progress was made during the month of December with the development of the local exchange system. New Exchanges opened included the following :—

PROVINCES—Herne Bay, Skegness.

Ancroft, Bassingham, Carradale, East Allington, Elton, Gorthleck, Gt. Alne, Gt. Tew, Huxley, Machrie, Parwich, Wiseton (all rural automatic),

and among the more important exchanges extended were :—

LONDON—Albert Dock, Merstham.

PROVINCES—Birmingham (East), Bury, Carlisle, Chester, Chorlton-cum-Hardy, Glasgow (West), Huyton, Llandaff, Luton, Ormskirk, Penrith, Preston (Lancs), Whitchurch, Wigan.

During the month the following additions to the main underground system were completed and brought into use :—

Manchester—Huddersfield cable,

while 76 new overhead trunk circuits were completed, and 87 additional circuits were provided by means of spare wires in underground cables.

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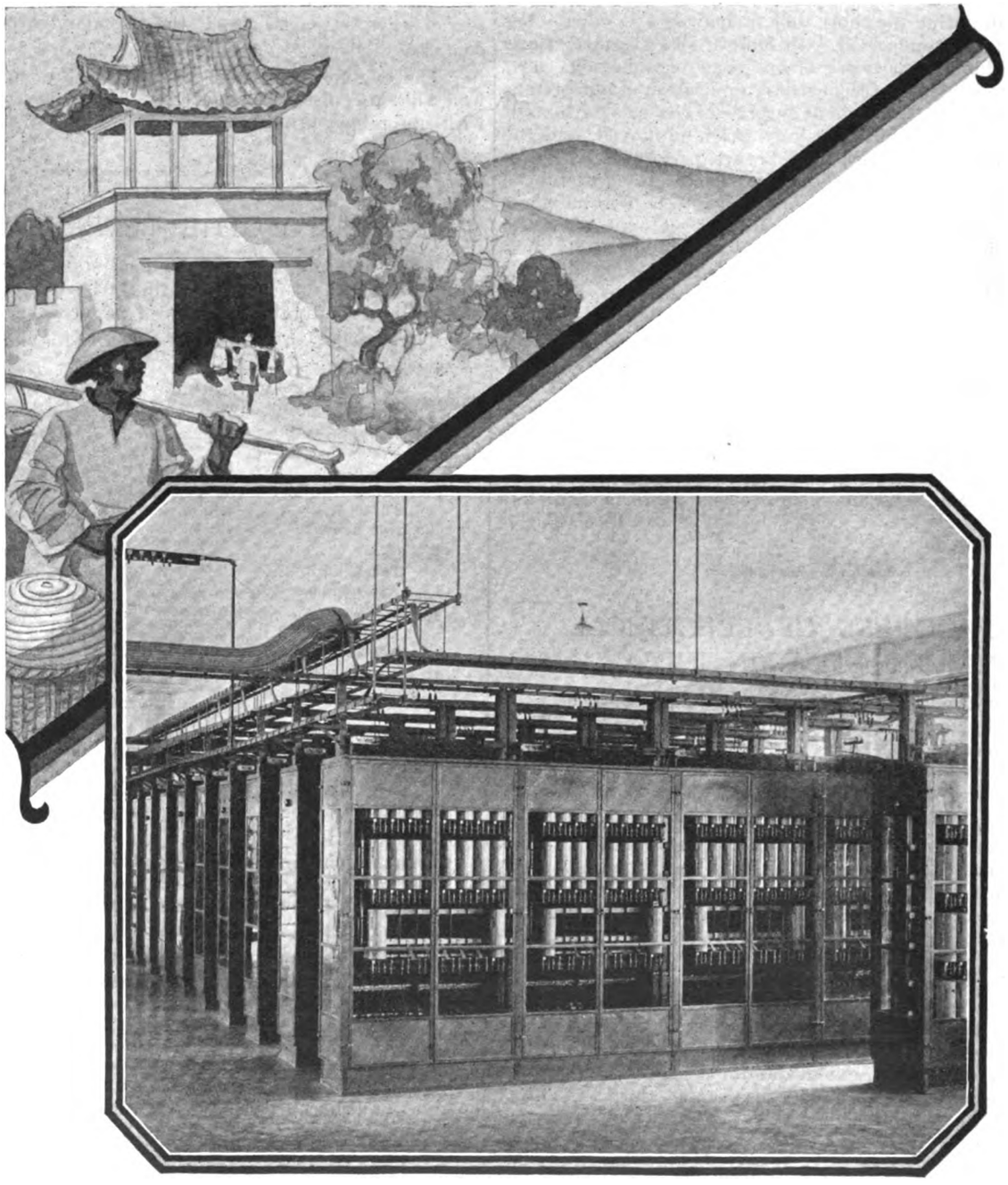

General view of Strowger Automatic switchroom at Dairen, Kwantung Peninsula. In this city where Japanese, Chinese, Russian and English are all spoken, the dial has been found to provide a universally satisfactory solution to the problem of providing telephone service to such a cosmopolitan population.

St
In

Factory and Ge

For Australasia
For Canada
Elsewhere

American Electric Co
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STROWGE

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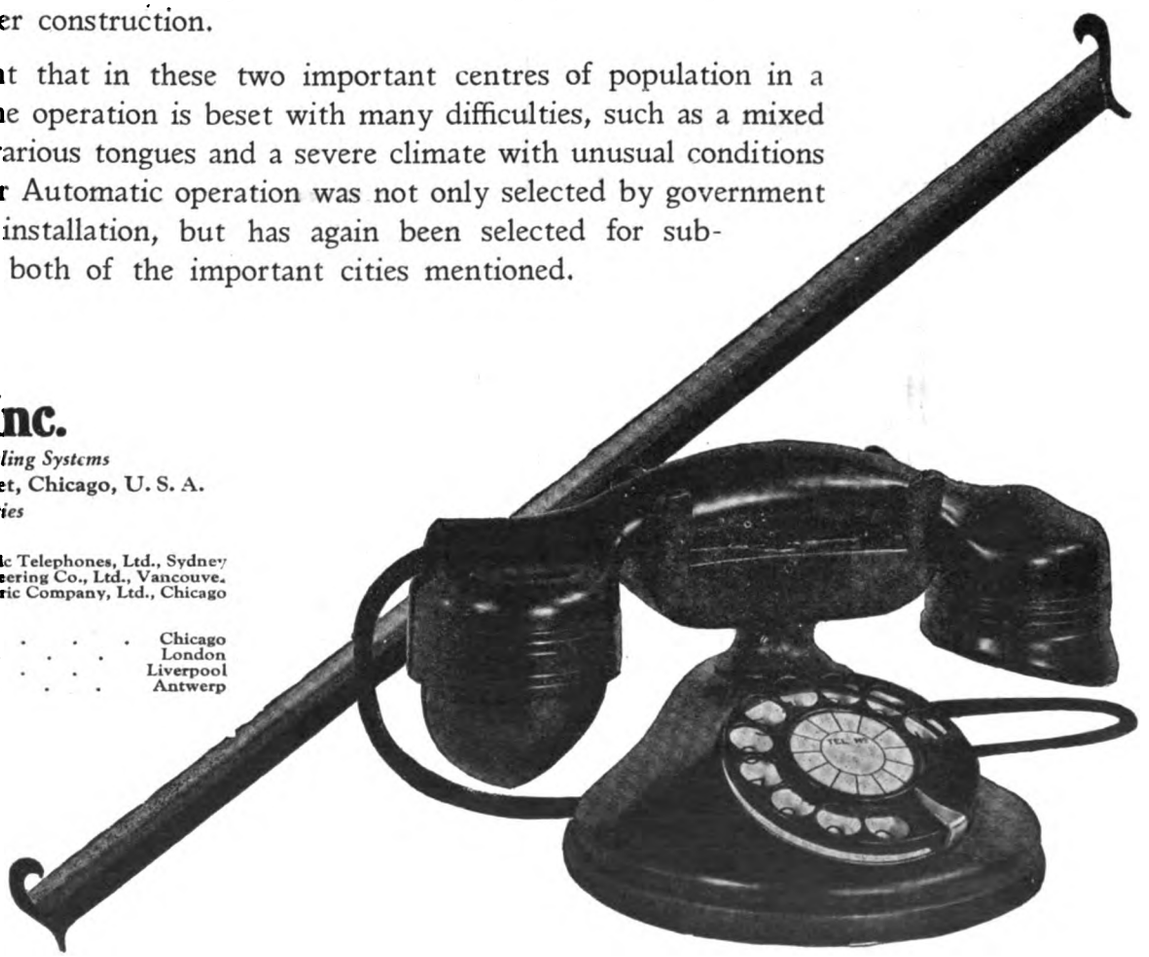
vger Automatic Operation he Far East.

DAIREN, situated on the southern side of the Kwantung Peninsular and near Port Arthur, has had Strowger Automatic operation since 1923. At present it has 7,100 lines of Strowger Automatic equipment in operation, with 400 more under process of construction. The important railway and industrial centre of Harbin, in Manchuria, has had Strowger Automatic telephones since 1921, and at present has some 3,000 lines of this equipment in operation, with 1,000 more under construction.

It is highly significant that in these two important centres of population in a region where telephone operation is beset with many difficulties, such as a mixed population speaking various tongues and a severe climate with unusual conditions of humidity, Strowger Automatic operation was not only selected by government engineers for initial installation, but has again been selected for subsequent additions by both of the important cities mentioned.



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The
Telegraph and Telephone Journal.

PUBLISHED MONTHLY IN THE INTERESTS OF THE TELEGRAPH AND TELEPHONE SERVICE, UNDER THE PATRONAGE OF THE POSTMASTER-GENERAL.

Editing and Organising Committee - - - Lieut.-Col. A. A. JAYNE. J. STUART JONES. W. D. SHARP. W. H. U. NAPIER. J. W. WISSENDEN.

Managing Editor - - W. H. GUNSTON.

NOTICES.

As the object of the JOURNAL *is the interchange of information on all subjects affecting the Telegraph and Telephone Service, the Managing Editor will be glad to consider contributions, and all communications together with photographs, diagrams, or other illustrations, should be addressed to him at the G.P.O. North, London, E.C.*1. *The Managing Editor will not be responsible for any manuscripts which he finds himself unable to use, but he will take the utmost care to return such manuscripts as promptly as possible. Photographs illustrating accepted articles will be returned if desired.*

VOL. XVI. FEBRUARY, 1930. No. 179.

THE KING'S BROADCAST.

ARRANGEMENTS on an unprecedented scale were made for broadcasting His Majesty's Speech at the opening of the Five Power Naval Armaments Limitation Conference on Jan. 21. Two separate broadcast transmissions were passed over the Transatlantic radio channels for the American broadcasting companies and successfully emitted from 124 broadcasting stations in the United States. In addition to providing these radio circuits to the American broadcasting companies the British Post Office supplied the following Anglo-Continental circuits to the British Broadcasting Corporation: 2 circuits to Paris (for transmission of the speech to French stations), 2 to Brussels (for Belgium and retransmission to Holland), and 2 to Berlin (via Cologne) for retransmission to Stockholm, Oslo, Copenhagen, Prague, Vienna and Budapest, retransmission for German stations being provided from Cologne. Reception was also obtained indirectly as far away as Italy and Poland. In short, nearly every country in Europe which had a broadcasting system took part in it, and in all about 270 transmitting stations were reached.

Furthermore, a trunk circuit was provided between London and the Marconi Company's broadcasting station at Bridgwater for effecting transmission to Canada, whilst in response to requests, the Post Office station at Rugby sent out a broadcast to Australia from which, also, several stations in New Zealand and Japan were successful in picking up the King's speech.

To carry out this comprehensive scheme so successfully required the closest co-operation between the Post Office, the British Broadcasting Company and the many other administrations and companies concerned, both at home and overseas. As was remarked in last Sunday's *Observer*:—

> "Thanks to goodwill and organisation all went smoothly, and a spectator in the control room" (a B.B.C. official is speaking) "would have been thrilled to listen to the various engineers talking to Paris, Berlin and other cities on the service circuits wherever operators were reporting on the quality of the transmissions along the primary lines of the broadcast.
>
> "Thus Vienna telephoned that 'the lines were good as far as Prague and good from Vienna eastward, but at Vienna itself they had changed over to wireless communication.' This message was typical of what was going on throughout the two hours or more."

We are chary of using such a well-worn word as epoch-making to describe this great occasion and the successful broadcasting, literally world-wide, of its opening ceremony. But we think that even the least thoughtful must have been touched by the solemnity of the occasion and its message of hope to the nations, and we should like to believe, now that the forces of wire and radio-telephony, with their unlimited range, combine to further the cause of peace, that a new epoch may truly be said to have been inaugurated.

PICTURE TELEGRAPHY.

LAST month saw the opening of a public service of picture telegraphy between this country and Germany; and the potentialities of picture telegraphy are still so obscure that it may well be that the event will be found in the course of time to mark the beginning of a new epoch in the history of the British Telegraph Service.

Picture telegraphy is no new thing. For many years the possibility of reproducing documentary or pictorial material in facsimile at a distance by electrical means has occupied the attention of many fertile minds, but it is only within recent years that the researches of the experiment-room have been rewarded by the development of systems which are efficient enough to be employed for commercial purposes. As often happens with scientific discoveries, several systems were placed on the market about the same time, and one of the difficulties presented to intending users is that of choice.

As might be expected from the nature of the new facility, the proprietors of newspapers were not slow in recognising its advantages for their purposes, and several newspapers have now the necessary equipment for the transmission of pictures between their London and provincial offices and even in some cases between London and Continental towns. The Marconi Wireless Telegraph Company have had for some considerable time a public service of picture telegraphy between this country and the United States and, until last month, this was the only public service of the kind in this country.

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The Post Office necessarily had to hold its hand until there was evidence of a public need and, now that that need has become apparent, it has opened the service to Germany, the system adopted being the Siemens-Karolus of German origin. The early extension of the service to Austria, Denmark, and Sweden is contemplated, and the question of further extensions to Continental countries as well as the establishment of services within the British Isles will no doubt come under consideration as time goes on.

There are not wanting enthusiasts who predict the supersession of existing methods of telegraphy by the picture method, and time alone will tell whether they are true or false prophets. In the meantime we may content ourselves with the thought that the Post Office telegraph service has acquired another instrument of much interest to itself and of benefit to the public at large.

THE GALES.

THE long succession of violent gales which have visited these islands this winter might arouse in the ordinary citizen a mild concern for the stability of his chimney-stack or garden fence, or perhaps a passing commiseration for the victims of those casualties about which he read in his morning newspaper. For the Post Office engineering staff, however—especially for those engaged in outdoor work—the hoarse and blustering voice of the gale is the signal for an immediate mobilisation of forces to do battle with an enemy of widespread destructive violence. No telegraph or telephone route, however solidly constructed, is impregnable against the assaults of falling trees or the flying wreckage from the storm. Main trunk routes may be placed underground in ever-increasing proportions; over five-sixths of local exchange wire mileage may be buried in conduits in the earth (as in fact they are), but thousands of miles of line, must, for various reasons, always be exposed to the fury of the elements at times like these. The first notes, therefore, of the rising gale are a certain prognostic to these men of wintry nights and days spent on the most exposed parts of the countryside, often on wild and lonely moors, at best on roofs and other perilous elevations. The average business man reads with dismay the tale of 200 trunk lines down, and may perchance feel next morning a little of the untoward effects which these tidings connote, but so rapidly are the ravages of the storm repaired that commonly this short-lived inconvenience is forgotten and the other aspects of the gale's work of destruction loom more largely in his mind.

We are glad to see that the skilful labours performed on these occasions, as a matter of course, by telephone engineers, have recently been receiving hearty recognition in the press. Articles descriptive of the expeditious work of the linemen, of the hardships they endure, and of their philosophic cheerfulness have appeared in several newspapers, and will do much to enhance public appreciation of the important public work they perform. It falls to many of us to work additional hours in times of emergency, to apply increased energy and endure increased strain on special occasions—but not with the concomitants of chilling blasts, sleet, or snow on wintry nights or at dark dawns.

HIC ET UBIQUE.

THE total number of telephones in Great Britain and Northern Ireland at Jan. 31 was 1,886,726, made up as follows:—

Post Office stations	1,849,181
Private systems (railways, &c.) with exchange facilities	13,448
Hull Municipal system	16,238
States of Guernsey system	4,353
States of Jersey system	3,506
	1,886,726

This represents an increase of 127,040 stations on last year's total.

The following letter to the *Daily Telegraph*, signed "Peterborough," demonstrates once again the difficulty of getting evidence as to the first exchange in London:—

> When was the telephone first in general use in London? Yesterday I was reading a book by Edmund Yates, dated 1874. In the publishers' advertisement pages it was stated, "You may communicate with us by means of the telephone number 313."

The evidence seems conclusive enough; it would appear sufficient to satisfy anyone who wished to prove his point. Yet, as we know the telephone was not invented until 1876 it was impossible for a publisher to be "on the telephone" in 1874. We can only conclude that the book in question was a later reprint, without alteration of date and with fresh advertisement pages.

An American lady recently addressed an enquiry to "The Radio Commission, London, England," for information concerning "thot waves," of which she had read in an American journal. Did they know anyone who had "thot waves," and were there laws in England covering them. Washington had already officially informed her than "thot waves" were not recognised as a means of communication over there.

We know of plenty of people who have "brain waves" in the Post Office (and outside), but "thot waves" (at least as a means of intercommunication) we have no knowledge of. The lady was accordingly informed officially to this effect, and also that there was no British legislation on the subject.

A testimonial to the efficiency of the "Personal call" system in the Anglo-Continental telephone service which was recently received from the proprietor of three Scottish theatres where Continental artistes are often engaged, is reminiscent of those feats of American telephony often trumpeted in the Press.

Urgent communication with two English-speaking artistes in a cabaret in Paris was required. Telegrams sent were advised as "undelivered, address insufficient." The sender then passed a "personal call," giving the artistes' names and the address of the cabaret as far as he knew it. He desired to express his high appreciation of the courtesy and helpfulness of the Glasgow and London exchanges, which resulted in his negotiations being successfully completed within an hour or two.

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Recently, says the *Leeds Mercury*, one who was staying at Gibraltar found himself seated near a telephone box in the hotel lounge. Unconsciously he heard a distinctly West Riding accent emanating from inside the glass.

"Yes," declared the voice, "It's warm and fine here. Is it raining in Wibsey?"

Judging by the ensuing remarks, the 'phone user was actually speaking to Wibsey, near Bradford. When the speaker left the box, the unintentional listener made himself known, and the other introduced himself as a well-known Bradford wool merchant engaged in the Moroccan wool trade.

He announced that he spoke from "the Rock" to his home every evening at a cost of 12*s.* for three minutes. "And it's worth it!" declared the Bradfordian.

WE reproduce this effort by a Swedish comic artist, for the benefit of our readers in the switchrooms, not because it is instructive or original, but because it will be seen therefrom that even

in Stockholm, the Mecca of so many telephone prophets, the telephonist does not escape the old, old libel.

WE are printing in another column an article on "Smelling by Ear" from the *Manchester Guardian*. They call this system synesthesia, and give various instances of similar interchanges of the senses.

This possibility of stimulating one sense through another is perplexing to the ordinary man and causes him much misgiving of the future developments of science. He fears snags. Will he be expected to take his "sausage and mashed" by wireless in future, and will it satisfy? And what will be his mental and bodily reactions when sipping a priceless burgundy if he gets a flavour of sauer kraut or vodka by wireless?

Jamming and reaching out (to use an Americanism) for foreign stations would, of course, present novel experiences, if not always pleasant ones. Porridge with the nuts, and pickles with the pastry, would not suit all constitutions.

SMELLING BY EAR.

REPORTED EXPERIENCE OF A RADIO LISTENER.

THAT curious mixture of the senses called by physiologists "synesthesia" is responsible for the fact that certain persons can receive a brain-message corresponding to one sense when another sense is stimulated. The most common case is that of "colour-hearing," where certain sounds produce the sensation of colours; but a writer in the *American Weekly* (New York), quoted by the New York *Literary Digest*, tells us that there are instances where a smell provokes the sensation of sound, where a colour produces a taste, and so on. Several theories are advanced to explain this curious effect, and the author prefers that which accounts for it by supposing some sort of a "short-circuit" between different brain centres, so that the sensation that ought to affect the centre of vision stimulates instead that of sound, for instance. We read:—

"A radio listener in Paris recently presented French radio engineers with a puzzling problem. When he listened to the church service broadcast from the Cathedral of Notre Dame, this listener said he also smelled the smoke of the candles in the church. Was it possible, he asked, that smell sensations might be picked up accidentally by the microphone?

"Radio engineers thought not, but were undecided about the real explanation. Certainly nothing of the character of a smell can possibly be sent out, everybody agreed, over radio waves.

"Fortunately for the candle-smelling Parisian, psychologists came to his rescue. He was the victim of a curious mental abnormality called 'synesthesia,' or the mixing of sensations. These instances are most likely to occur in people above the average in mental powers, education, and culture.

"In the Parisian case the listener got his hearing sensations mixed in his brain as they came in. Some of the nerve impulses leaked across the brain to affect the centre for smells. That the listener seemed to smell burning candles is explained by past association.

"In the records of laboratories of psychology are accounts of individuals whose taste sensations got mixed with sounds or with sensations of colour; of individuals whose smell sensations called up colours or scenes; of still other persons whom sounds made to feel paid or whom pain made to hear imaginary sounds. Apparently nearly every possible mixture of one sense with the other has been detected in at least one abnormal individual.

"Some such mixtures are familiar. Taste sensations, for example, are not infrequently produced by the sight of food. The fact that the body feels the taste impulses unconsciously is indicated by the common observation that sight of food often 'makes one's mouth water.'

"By far the commonest of these abnormalities are colour sensations called into being by ideas of other kinds. 'Colour hearing' is one of the commonest cases, a condition in which the hearing of some sound always calls up in a person's mind the sensation of a definite colour."

There can be no doubt, we are assured, that these colour experiences on hearing sounds are perfectly real to the persons who experience them. Not long ago in Germany a Dr. Anscutz, musician and psychologist, broadcast by radio an appeal for persons possessing these powers to present themselves for psychological study. One hundred and fifty individuals came forward, which must indicate that an immensely larger number of such persons exist. The writer goes on:—

"Dr. Ponder, Dr. D. F. Fraser-Harris, of London, and other experts located many other cases. Something like 12% of the average population possesses, Dr. Ponder believes, traces of this colour-hearing power. It belongs, he suspects, to an actual majority of young children, although it often fades as a child grows up."—*Manchester Guardian*, Jan. 4, 1930.

TRANSFER OF MR. F. E. C. B. ADAMS, BELFAST.

ON Dec. 30, 1929, a large and representative number of his colleagues met at the District Manager's Office to say official farewell to Mr. F. E. C. B. Adams (Contract Manager) on his transfer to York.

The District Manager, Mr. T. Rodger, presided and presented Mr. Adams with a handsome silver tea service as a mark of appreciation and respect from the staff. Messrs. Maskrey (Traffic Superintendent), Peck and McBrien (Engineering Department), Green, Holmes and Gossan (Contract Section) and Stanfield (Accounts Section) also spoke in glowing terms and wished Mr. Adams every success in his new district.

Mr. Adams responded feelingly, and, thanking the District Manager and Staff for their kind wishes and very practical and artistic gift, said he and Mrs. Adams had found many warm friends in Belfast. Their stay in Northern Ireland had been a very happy one and they left with many regrets.

It is interesting to note that during the six years Mr. Adams was in Belfast there was an increase of over 7,000 subscribers, 62 new exchanges were opened, and over 120 street kiosks erected. Those who know the special conditions peculiar to Northern Ireland fully appreciate the amount of energy and enterprise necessary for the production of such splendid results.

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THE LONDON-BERLIN PICTURE TRANSMISSION SERVICE.

By E. PHILLIPS.

THE Picture Transmission Service between London and Berlin was opened on Jan. 7 by the exchange of photographs and written greetings between the Postmasters-General of Great Britain and Germany.

The service has since been extended to Frankfort-Main, and steps are being taken to extend it to other places.

A GREETING BY PICTURE TELEGRAPHY.

(*Translation.*)

VIENNA COPENHAGEN
STOCKHOLM LONDON
FRANKFURT M.

A Happy New Year to all Picture-Colleagues.
PICTURE-STATION, BERLIN.

The new service permits transmission and reception of all types of pictured or printed matter in monochrome. The picture is received as a photograph, and sensitiveness to colour corresponds to that of an ordinary photographic plate. For monochromatic matter, such as print, line drawings, block prints, or reproductions of photographs a high degree of faithfulness is obtained.

The system used is the Siemens-Karolus-Telefunken, which has been developed by Dr. Karolus, of Leipzig, in conjunction with the Siemens-Halske Company of Berlin. The sending system consists of a lamp giving a bright spot-light which is directed through a system of lenses and prisms on to the picture to be sent. The light beam is interrupted by a rapidly revolving perforated disc. A carrier-wave of a certain frequency is thus generated. After passing through the holes in the interrupter disc the light beam shines on the picture being transmitted and is reflected from this on to a photo-electric cell. This is an evacuated glass bulb, or tube, which has part of its inner surface coated with potassium or other alkaline metal, which has the property of emitting electrons under the influence of light. The electrons emitted by the light-sensitive surface are caught on a wire mesh placed in front of the surface. The light-sensitive coating is connected to the negative pole of a battery, and the mesh is connected to the input of a valve amplifying system. When light falls upon the light-sensitive surface a tiny current, measured in micro-amperes, is generated, and passed to the amplifying system for transmission.

The picture to be transmitted is clipped to a drum and enclosed in a light-tight cylinder, which has an opening facing the photo-electric cell. The drum revolves at a steady rate. The light from the lamp is concentrated by the last lens into a point of light on the surface of the picture. It is then reflected on the photo-electric cell, the intensity of the reflected ray varying as the surface from which it comes is light or dark. The current from the photo-electric cell varies in sympathy, and the variations are passed through the amplifier to the transmitting medium.

The optical system exploring the picture drum is mounted on a spiral axle, and moves upward or downward as required. The axle is driven by the same motor that drives the drum, with suitable gearing, and the pitch of the spiral is such that the light beam "explores" the whole surface of the drum in lines of 0.20 mm. width in a certain space of time. This take 20 minutes in the London-Berlin transmissions. With overhead lines the time could be considerably reduced.

At the receiving end translation of the electrical signals into terms of light is effected by a "Kerr Cell." This consists of two "Nicol Prisms" with a "benzole" cell in between. A Nicol Prism is a crystal of Iceland Spar (calcium carbonate). It has the almost unique property of "double refraction," i.e., when a beam of light is admitted into it, two beams emerge. When cut in a certain manner, and the severed parts cemented together with Canada balsam, the Nicol Prism has the property of "polarising" light. In the Kerr Cell, two "Nicols" are arranged so that the polarisation plane of one opposes that of the other. No light then passes through the system. The "benzole" cell has the property of rotating the plane of polarisation when in a condition of strain. The strain is imposed on the benzole solution by a small condenser immersed in it. The incoming signals are brought to this condenser after suitable amplification. A maximum voltage of 700 R.M.S. volts is used. When a current comes on to the condenser the plane of polarisation of the beam coming through the first "Nicol Prism" from the spot-light lamp is changed to a greater or less degree. Light will then pass in greater or less degree through the second Nicol prism. This is directed by glass prisms and lenses as a spot on to the surface of the photographic film on the receiving drum. The film is thus affected in a corresponding degree to the varying intensities of light reflected from the picture on the sending drum. The film is afterwards developed and prints made from it in the usual way. The result is a picture of "grain" so fine that the lines of which it is composed can only be seen with the aid of a magnifying glass. It is indistinguishable from a photograph taken in a camera direct.

TELEGRAPH PICTURE OF THE PARLIAMENT HOUSE, VIENNA.

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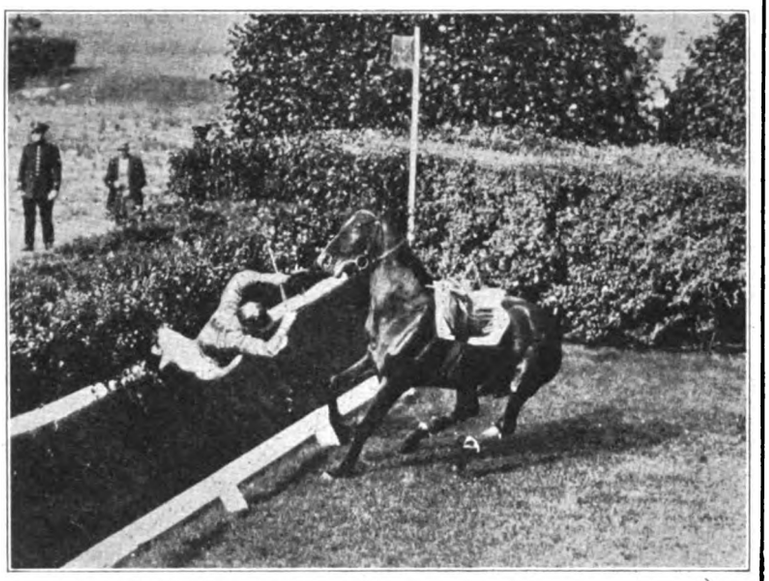
Synchronism between two stations is maintained by "tuning forks" enclosed in thermostatic chambers. The speed is checked by means of stroboscopic discs. Before transmission is commenced the forks at the sending and receiving ends are "tuned" to each other. A high degree of synchronisation is maintained. The variation at the end of a 20-minute transmission is infinitesimal. To ensure that the beginning-point of transmission and reception of a picture shall coincide at both stations, a "phasing" signal, which causes a neon lamp to flash behind a certain spot at the receiving end, is sent before transmission is begun.



RACING EPISODE TELEGRAPHED FROM BERLIN.

The system was first used between Berlin and Vienna in 1928. There are now public stations at Stockholm, Copenhagen and Frankfurt-Main, in addition to London and the two first mentioned. Private installations are also maintained by Press syndicates in Great Britain and on the Continent, and also in Japan. Australia has a service between Sydney and Melbourne. It is evident that this new method of communication will become important in the future.

REVIEWS.

"*Overhead Power Lines: Elementary Designs and Calculations.*" *Capt. W. Morecombe. Chapman & Hall.* 15*s. net.*

THIS book is of interest to Post Office engineers as a complement to the Department's instructions on overhead telephone lines. It deals with most of the points which arise in the design of overhead power lines, taking the Electricity Commissioners Regulations as a basis. The bulk of the text is devoted to mechanical problems, and considerable attention is given to the difficult and frequently neglected question of the strength of pole foundations.

In view of the small use which is made in this country of ferro-concrete poles, it is perhaps not surprising that little detail is given regarding this type of support. It would, however, have been interesting to have had some information regarding workshop produced centrifugal spun poles.

Reprints of the latest safety regulations of the Electricity Commissioners and the Post Office are given as appendices.

"*High Voltage Cables.*" *L. Emanueli. Chapman & Hall.* 8*s.* 6*d. net.*

This book covers the ground included in Mr. Emanueli's course of five London University lectures delivered at the Institution of Electrical Engineers last winter.

The introductory lecture deals very briefly with the manufacturing details of lead covered, paper insulated power cables and with the properties of insulating paper. The subsequent lectures deal in turn with impregnating compounds, the electrostatics field in an A.C. power cable, the dielectric of a cable considered from the point of view of its impregnation and the chemical and electrical qualities of the finished cable. The last two lectures bring out the difficulties encountered in the production of a satisfactory cable for high voltages, and lead up to a description of the oil-filled cables which are now being worked in the U.S.A. and in Italy, up to a maximum pressure of 132 kV.

LONDON ENGINEERING DISTRICT NOTES.

Institution of Post Office Electrical Engineers.

A LARGE and representative gathering assembled on Jan. 14 at the Institution of Electrical Engineers to hear a paper on "Critical Methods of Investigation as applied to the Study of Telephone Areas and Plant Layout," read by Mr. J. N. Hill, of the London Engineering District.

The Chairman of the London Centre, A. B. Hart, Esq., presided.

The speaker gave a clear exposition of the reasons which justify investigations being made into the economics of telephone engineering and explained in detail some of the methods adopted in dealing with the problems which have arisen in connexion with the London Telephone Area.

The paper was illustrated by a large number of lantern slides.

In the discussion which followed Mr. Hedley and Capt. Hines paid a well-earned tribute to the personal work done by Mr. Hill and to the fact that many of the methods described in the paper were devised or suggested by him. Capt. Reid, Messrs. Hay, Morrish, Meek and Ings also spoke, and after Mr. Hill had ably replied to the discussion the meeting closed with a hearty vote of thanks to the author.

New Exchanges.

The following exchanges were opened during the month of January :—

Name.	*Type.*
Hurstway	Hypomatical on Ravensbourne.
Springpark	C.B. nr 10.
Redhill	C.B. nr. 1.
Theydon Bois	C.B. nr. 10.

Exchange Construction.

Automatic equipment is being installed in the following exchanges: Primrose, Amhurst, Fairfield, Addiscombe, Shepherds Bush, Livingstone, Macaulay, Gladstone. Manual apparatus is also being provided at Ingrebourne (Harold Wood), Loughton, Romford, Silverthorn (Chingford)

"RELAY" AND "STERLING" FUSION.

A FUSION of manufacturing interests has been arranged between The Relay Automatic Telephone Company, Limited, and The Sterling Telephone & Electric Company, Limited.

The manufacturing facilities at Relay House, Streatham Hill, will be considerably augmented to deal with the dual output of these two companies, which will manufacture Automatic Telephone apparatus and Manual Telephone apparatus respectively.

All enquiries in connexion with the Sterling Company's products should now be addressed to :—Relay House, Streatham Hill, London, S.W.2.

NEW CHILI TELEPHONE CONCESSION.

THE Chilian Senate yesterday approved the new 50-year concession permitting the Chili Telephone Company, associated with the International Telephone and Telegraph Corporation, to penetrate throughout the country with its own lines and to connect the system with all other national operating systems.

It was in 1928 that the Chili Telephone Company became associated with the International System, and while since that time it has been operating the largest telephone system in Chili, yet their lines have not yet reached all parts of the country. International service with the neighbouring republics of Argentina and Uruguay has been established and a definite prospect now is opened for an extension to other territories served by the International System via the Buenos Aires—Madrid radio link of the Compania Internacional de Radio (Chili). This new concession brings Chili within speaking distance of Europe, and shortly a similar connexion will be effected with the United States.

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MRS. MOONLIGHT'S FIRST RETURN.

"MRS. MOONLIGHT."

MR. E. A. POUNDS' production of this play, by Benn W. Levy, described as "A Piece of Pastiche," was successfully given at the theatre in the Guildhall School of Music and at the Cripplegate Institute early in January. The "pastiche," or phantasy-piece, as we should prefer to describe it, depends for its main motive on the idea that the heroine, having expressed, while in possession of a magic stone, the unholy wish never to grow old, becomes a prey to the dread of its fulfilment, whilst all those she loves are yearly showing the ravages of age. This is in effect what happens; and once you have accepted the phantasy as valid, you can proceed to enjoy a very well-written and moving drama. Mrs. Moonlight, tormented by the prospect of unchanging youthfulness of appearance, elects to disappear and efface herself, reappearing under different sobriquets at intervals of twenty years—the first time to find her husband re-married to her adopted sister, and opportunely to prevent her daughter's marriage with an undesirable by exercising her own youthful charm upon him; and the second time to find her grandson grown up and her husband bereft of his second wife and most of his faculties. His puzzled recognition of his beloved lost wife, whilst her personality remains an enigma to the other characters about her, formed a touching climax to the play.

The chief honours fell, we think, to Miss Sallie Latimer in the title part of which she gave a sympathetic and charming rendering, while Mr. Walter Beale as the somewhat self satisfied, good-natured husband, sustained a heavy part with great effect. Mr. Roy Beaumont as Willie Ragg gave a finished representation of the plausible "bounder," and Mr. Edwin Neal was admirable as the foolish swain who, however, makes a solid (if second choice) husband for the young heroine, Jane. This latter role was acted with considerable natural charm by Miss Nora Cheason, both as a coquettish young girl and a sensible wife and mother. Miss Peggy Murray was most delightful and convincing as the faithful Scottish maid, and Miss Eilleen Jones filled the part of the second wife, Edith, with distinction. It only remains to add that Mr. Leslie Craft was quite adequate in the small part of Peter.

Mr. Pounds' production of the play reflects the greatest credit on himself and all concerned, and bore plainly the marks of his experience and good taste. All taking part were connected with the Service. The play was received with considerable enthusiasm and appreciation.

W. H. GUNSTON.

PRESENTATION TO MR. E. H. DYKES.

THE closing hours of 1929 were marked by a pleasing function in the C.T.O., London, at which a presentation, on the occasion of his retirement, was made to Mr. E. H. Dykes, Inspector of the Maintenance Staff of the Engineer-in-Chief in that office. The chair was occupied by Mr. W. Deane (Sectional Engineer, C.T.O.), who was supported by a large gathering of all ranks in his department as well as representative members of the traffic side of the office, past and present.

The CHAIRMAN, in his opening remarks, paid tribute to Mr. Dykes' unblemished service of 46 years, a record of which any officer might be proud, and subsequently made the presentation of a cabinet gramophone and accessories. Other speakers included Messrs. Hart, Sutton, Gayfer and Tyrrell (the latter on behalf of the Traffic side). The common burden of their remarks was a reference to Mr. Dykes as one of nature's gentlemen, which had enabled him to win the respect and esteem of all with whom he was brought into official contact. Individually, the speakers recalled various outstanding events in his official career, notable among which have been the part he played in the first establishment of Baudot working between this country and the Continent in 1898, his journey to India in 1905 to set up the same instrument in that country, and finally its inauguration for the purposes of purely British telegraphy in 1910.

During the proceedings the Chairman read telegrams received from the maintenance staffs of the Birmingham and Glasgow offices, with whom he had been associated in connexion with the work last named.

Mr. Dykes, in a reply tinged with emotion, recalled the conditions which prevailed in his department when he entered the service, and sketched its expansion. He then thanked everybody, of all ranks, on both the engineering and traffic sides, for their tolerance, helpfulness and loyalty. He would not pretend to have had no differences or anxious moments, but he had striven never to lose his temper, as nothing was gained thereby.

Judging by the testimony of the other speakers, he literally succeeded in this and other high endeavours, and there were probably not a few whose final handshake was accompanied by the thought that here was a man who had achieved very much more than the average as regards the things that matter most in life.

J. G. K.

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CORRESPONDENCE.

HOW TO IMPROVE THE TELEGRAPH SERVICE.

TO THE EDITOR OF "THE TELEGRAPH AND TELEPHONE JOURNAL."

DEAR SIR,—I do not wish to create an unfavourable impression as a result of continued, although, I hope, constructive criticism.

It must be admitted that Mr. Teasdale has produced a hard nut for critics to crack, but gives an opening when he tramples on my pet theory.

An express delivery fee of 6*d*. per mile in excess of the radius of one mile is suggested, and to be charged to the addressee, which imposition, your correspondent states, will be a further inducement to the recipients to become telephone subscribers.

I again submit that this would be a disastrous policy, and that it is another vivid illustration of confining thought to within a certain circle. Not only the addressee, but Fleet Street, and the senders, would be inclined to delete the words "be a further inducement to" and substitute the single word "force." *If you refuse to have a telephone we shall make you pay 6d. extra on all messages which you receive* !

The majority of people who reside a mile or so from an office of delivery in rural areas, if not subscribers by now, are not likely to be so for many years to come. To impose a fee under such conditions would seem like victimisation when it is considered that factories, business houses, and others to whom the telephone is of vital importance and a valuable asset, would be exempt.

Mr. Teasdale states that he does not advocate an increase in cost to the sender. Even so, I maintain that the latter would refrain from using the service on being informed of the addressee's liability. Both must be considered. We are servants of the whole public—not 50% of it.

The suggestion to display notices in all post offices calling special attention to facility of telephonic delivery would be of much greater value if reproductions were also embodied in general advertising matter, such as folders, brochures, and posters. People will unconsciously distribute the two former, and the poster will serve to educate, thus lightening the burden on the counter clerks' shoulders, not adding to it, as is suggested.

If the most modern and prominent advertisements are studied, the atmosphere of "notice" will be found to be entirely absent. Even typographical productions convey a personal touch. Study of psychological effect is a very important item on the list of a successful advertiser's qualifications.

Included in copy for external display, the reproductions suggested would give more prominence to telephonic facilities, and the dual purpose of advertising both telegraph and telephone services be better served. I contend that both would benefit. Is there any reason why the systems should not assist each other to push their "wares"?

W. T. L. (C.T.O.).

THE CIVIL SERVICE UNIVERSITY STUDENTS' ASSOCIATION.

TO THE EDITOR OF "THE TELEGRAPH AND TELEPHONE JOURNAL."

DEAR SIR,—This Association has been formed for the simple purpose of the advancement of the interests of university education in the Civil and Local Government Services, and for the furtherance of the economic welfare of all those employed in the public services who have obtained university degrees or diplomas, or who may now be studying in preparation for such.

The Association is not a trade union, nor is it a grade union. All classes of Government employees are eligible for membership, providing solely that they have already obtained their university qualifications. Those now preparing for university examinations are also admitted as Student Members. The motto of the Association is "We Study to Serve the State."

Men and women are alike eligible. There is no subscription. There are no political aims. There is no clashing with the interests of any other staff association. There is no conflict with the Treasury or with any other Government Department. There are no obligations whatever upon members. The only conditions of entry are that Members must have already studied to serve the State, or Student Members must be now in course of studying to serve the State.

There is no restriction whatever as to grade or office in which employed, except that heads of departments, and those belonging to the Administrative Grade are not, of course, expected to join. Nor is there any desire to overlap with the Institute of Professional Civil Servants. The idea underlying the movement is to get together all those who have studied to serve the State over and above the obligations of their normal conditions of service. It is hoped to prepare a case to put before the Royal Commission to secure economic recognition for all such enthusiastic servants of the State.

For that purpose, all who have at any time obtained university degrees or diplomas, or who may now be in course of preparation for such, are requested to write at once to the Organising Secretary at "Thirlmere," 1303, London Road, S.W.16, stating briefly their university qualifications obtained or for which preparing, their office of employment and grade, date of entry into service, and date of attaining university qualifications, and what promotion, increment, or other recognition of any kind they may have received from their State employers.

No entrance fee is necessary. Only enclose a stamped addressed envelope with every communication. Write at once. There is no time to lose. There must be a very large number of readers of the *Telegraph and Telephone Journal* who are eligible for Membership and Student Membership of this Association.

Holders of Certificates from Learned Societies or Professional Bodies such as the Institute of Bankers, Chartered Institute of Secretaries, &c., &c., are also eligible to join the Association and are cordially invited.

Within less than six weeks 122 Members of the Association have been enrolled (86 of whom are in London). They include 61 clerical officers, 4 higher clerical, 3 executive, 10 S.C. & T.'s, 9 traffic officers and 4 telephonists, amongst whom 23 hold university degrees, 23 have matriculated, 15 passed the inter-examination, 9 have various diplomas and 28 are members of professional societies.

J. T. E. A. WADDELL, B.A., D.P.A.

C.T.O. NOTES.

Promotions.—Messrs. E. Colliver and R. Sleigh, Overseers to Assistant Superintendents, W. Wallman, C. T. Drywood, A. W. J. Rates, W. P. J. Ward, E. C. Gillett, A. C. Moody and H. Thomas, Telegraphists to Overseers.

Retirements.—Messrs. J. W. C. Duncan, Assistant Superintendent, A. W. J. Hooper, H. M. Sim, Overseers, W. A. Gunn, C. O. Viveash, J. Williams, G. W. Matthews, Telegraphists, Miss M. V. Hailes, Telegraphist.

Obituary.—We regret to record the sudden death of Miss A. F. Stapley, Assistant Supervisor. She was on duty on Jan. 7 and died the same evening. Miss Stapley was of a quiet, unassuming nature, and leaves behind her many sorrowing friends. To her relations we extend our deep sympathy.

We also regret to record the death of Mr. A. Bowden, on Dec. 10, 1929. He had been retired for about 5 years.

Bowls.—In our last notes it was reported that the Bunbury Cup was won by the Admiralty Club. This was incorrect. The Admiralty Club were the winners of their section and played the winners of the other section, the L.T.S., and were defeated by them. The holders of the Cup are therefore the L.T.S. (as recorded in the *Journal* for December, p. 56).

Chess.—The "Centels" are at the head of the table in the Civil Service League, Division 3, being half a point ahead of the Admiralty II, who, however, have a match in hand.

There is every prospect of a fine finish in this section, with the Admiralty II holding the advantage, and the Air Ministry close up.

The "Centels" bade good-bye to the Civil Service Minor Cup, the Ministry of Pensions II beating them in the second round for the second year in succession. It was a good match, four games being sent for adjudication.

In the London League "C" we share the top position with the Railway Clearing House, having won 5 and drawn 1.

The match with the R.C.H. was a fine contest and ended in a draw.

The second team, in Section 5 of the Civil Service League, have won 4 and lost 4.

The office contests are well supported again, 20 enthusiasts are battling for the Laxton Cup and office championship, and a good number of juniors are contesting the Junior Knock-out Handicap.

With more than half of our fixtures safely negotiated in this, our seventh season, we still hold our very fine record of never having lost a game by default. We have played over 2,500 league games in the different leagues without a failure. In view of the peculiar office conditions regarding duties, &c., this is a record of which everyone may well be proud and reflects great credit to everyone.

The City of London Male Voice Choir.—The choir have given another successful concert in aid of the Wanstead Orphanage at Waltham Cross. The financial result was in keeping with the musical success and it is pleasing to announce that the Orphanage have bestowed two life governorships on the Conductor (Mr. R. P. Mitchell). These have been transferred to the C.T.O. Benevolent Fund.

During this year the Choir will be assisting the Alexandra Orphanage and also competing in the London Musical Festival in March.

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Samuel Smiles.

IT seems so remarkably easy to put one's foot in it. I remember once when climbing Hellvellyn—perhaps climbing is not quite the right word; ascending would be better, it sounds more dignified and leaves the reader in doubt as to whether I really climbed or only crawled—anyway, I remember that on that occasion a lady of the party failed to tread delicately, with the result that one well-booted leg disappeared up to the knee in a bog. It was really most amusing, and I seized upon the opportunity to remark that it was a case of "'Knee plus ultra,' i.e. and to wit, 'Thus far and no farther,' or in other words, 'Never no more.'" I was told to lend a hand instead of gibbering bad Latin and being an insufferable idiot. The appositeness of the quotation as applied to the particular situation was lost and what was a real good joke was killed with scorn. Then there was the incident of the Scot who was once my friend. It was a braw nicht when he rose to leave my house. He very carefully donned a thick overcoat, gloves, muffler and goloshes and completed with a hat and an umbrella. When he had finished swathing he remarked, "Must take care of myself—good Scotsmen are scarce." "Yes," I said, "so I've noticed." He hasn't been since. Similarly, there was a sister who had been to see an old friend's new baby. After a considerable (and boring) account of its many qualities the sister said "And directly she saw me she laughed." "Which shows," said I, "that the kid was born with a sense of humour." Well now, didn't it? but—anyway, sisters don't matter much.

Latterly I seem to have plunged the hoof through the pie-crust again and C.A.S. has boxed my ear with a large lump of verse—very good verse, too, mark you, although she merely calls it rhyme. At first it seemed rather thrilling to have verse addressed to me, but later I came to the conclusion that pride was not the reason for my ear swelling. She conveys her rebuke in such an "arch way" that I cannot possibly be cross with her. And she calls me "Boy!" Now isn't that *real nice!* After that I should simply hate to run over her with my bath-chair—it would seem *so* ungracious, wouldn't it? The extent to which I misplaced the pedal extremity can be judged by the fact that I am charged with having imputed treason and crime to her. Ah! woe is me, alackaday! Does she so hang upon my words that she must needs hang me with them afterwards? It just shows how careful one should be with one's feet when writing. Be warned in time to watch your words, and if not by me, then by the example of the man who said "I will" once too often and spent the rest of his life in sackcloth and ashes.

If to her plea for pardon I say "Granted, my fault entirely," I gather that Samuel smiles again—so I say it. But I bet her name is not Samuel, and thus another good joke goes west, and two more feet are planted in error. The man's a perfect centipede!

PERCY FLAGE.

Streatham Exchange.

On Dec. 21 the Staff of the Streatham Exchange entertained one hundred poor children from North Lambeth to the Circus at Olympia.

Two London General Omnibuses collected the children and helpers at 1 o'clock and set forth. It was a very riotous, noisy journey, but Olympia was reached in due course, when the songs of the visitors were hushed in the wonders of the performance. After two and a half hours of spellbound enjoyment, in which the antics of a trapeze Charlie Chaplin were most vociferously applauded, tea was kindly provided by Mr. Bertram Mills. The homeward journey was made in much the same fashion as the outward, and home was reached after a most enjoyable afternoon.

E. M. G.

Our Portrait Gallery.

Miss Beatrice Ashmead started her telephone career with the National Telephone Company at the old Queen Victoria Street Exchange, graduating from there to many other London exchanges.

Her long experience at all types of exchanges combined with her well-known keenness have enabled her to acquire a very thorough knowledge of all phases of her work.

No. 5.—MISS B. ASHMEAD.

Her personality and zeal for the welfare of her staff have endeared her to all those with whom she has come in contact. During her service she has worked at Queen Victoria Street, Hop, Gerrard, North, Battersea, Paddington, Western, Holborn, Victoria, Avenue, and Central, where she now remains as the Chief Supervisor.

Miss Ashmead takes a keen interest in the Civil Service Women's Missionary Society. Her chief hobby is gardening.

Onaway Awake.

(*New Version.*)

C.C.S.! All hail—beloved!
Thou, the mainspring of the Service.
Thou, the magic, mighty medium
Through which endless traffic passes!
Doth not thy congestion pilot
Leap to notice—leap to notice—
When, thy digits swift appearing,
Ev'ry marker pilot gloweth?

When thy boards are staffed, beloved,
I am happy—I am happy!
As the Supers in the springtime,
When returns their truant bonus!
Smile the staff and smile the Supers,
Smile the august ones above us!
But we lose the way of smiling
When thy boards go out of order!
Doth not thy congestion pilot
Leap to notice—leap to notice
When thy path is blocked, beloved,
And there are no calls arriving?

When displays are mutilated
Or thy digits all are darkened,
Points thy shining marker pilot
To thine interception circuit!
Doth not every force within thee
Leap to action—leap to action
At the impulse of directors
Oh, thou mainstay of the Service?
C.C.S.! C.C.S.! All hail, beloved!

C. A. S.

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Reliance Exchange.

An enjoyable Christmas party was given on Thursday, Dec. 19.

By kind permission of Mr. Warner, the Chief Engineer, the party was held in the Engineers' Mess Room, Mr. Streatfield giving his ready assistance. The tasteful and cosy decorations reflected great credit on those responsible.

Mr. Ballard, the Service Superintendent, made an excellent M.C.

Miss Roe, Supervisor of the Exchange, Mr. Howard, Traffic Officer, and about 40 telephonists, engineers and friends were present. The entertainment consisted of songs rendered by the Misses Dennis and Rush (which received spontaneous appreciation), community singing, games and dancing.

A very pleasurable evening concluded with the singing of Auld Lang Syne.

W. J. H.

Contributions to this column should be addressed: THE EDITRESS, "Talk of Many Things," *Telegraph and Telephone Journal*, Secretary's Office, G.P.O. (North), London, E.C.1.

MANCHESTER NOTES.

New Premises.—At last we have a permanent habitation for the District Manager's Office at Manchester. During the past 20 years removals have been effected at intervals of about every seven years, but we hope the latest removal to Telephone House will suffice for many years to come.

The new building, which occupies a commanding position in Chapel Street, Salford, was commenced on Jan. 1, 1926; its progress was delayed for about nine months during the disastrous strike of 1926, and was further delayed by a subsequent plasterers' dispute of some months' duration. Anyhow, at the end of September last a portion of the building was made ready for the reception of the District Manager's staff, the Accounts and Traffic Section occupying the whole of the 4th floor and a portion of the 6th floor being allotted to the Contract Section.

The building is of 8 floors, excluding the basement, and the area of each floor is approximately 20,000 sq. ft. The switchroom on the 7th floor, in which the Toll Exchange will be housed, is reputed to be the largest in Europe. Construction is proceeding apace on this exchange and is expected to be ready for service early in the spring in conjunction with the opening of three automatic exchanges in Ardwick, Collyhurst and Moss Side. Eventually three automatic exchanges, Blackfriars, Deansgate and Victoria, will also be housed in the building, which will be the hub of the very extensive director automatic scheme designed for the Manchester automatic area.

The removal of the District Manager's Office from our old quarters at Peru Street was effected during the week-end Sept. 21-23; over 50 van-loads of furniture and records were dealt with and put into pre-arranged positions ready for the staff on Monday morning, and it is satisfactory to record that 75% of the staff were able to settle down in their new domicile by 11 a.m. Some of our old office fittings were discarded and new and up-to-date fitments supplied, but there still remains more to be done in this direction. When completed, however, it is thought the Manchester District Manager's office will be the best equipped office in the country.

Staff Dance at Telephone House, Nov. 16.—"Telephone House" is the great new building which will soon become the nerve centre of the Manchester automatic system. It is a very massive youngster of whom we are all hoping great things, and the first social step in its young life has now been taken. It has had its first party.

To the outsider the building presents a very solemn, very businesslike, exterior, and few passers-by on that historic evening could have imagined that such a spirit of gaiety was rife on the 5th floor.

The first staff dance, held in the new dining-room, was really a wonderful success, and members of the various telephone staffs, their friends and wives, some 350 in all, had a thoroughly enjoyable evening.

In making a happy speech of welcome to all present Mr. J. T. Whitelaw, the District Manager, read a letter in which Mr. J. G. Maddan, the Postmaster Surveyor, expressed the hope that "all would have a jolly evening, and that everything may go so well as to make everybody in love with Telephone House."

In spite of the large attendance, supper was served to all the dancers simultaneously, in three other rooms. The arrangements were a triumph of organisation and did great credit to the small army of helpers, many of whom had spent a very strenuous afternoon in preparation.

The District Manager's staff is already working in the building, but for the supervisors and telephonists in the Manchester postal area the dance was the occasion of their first visit. First impressions are lasting ones, and the recollection of this most enjoyable event will go a long way towards establishing for "Telephone House" a warm corner in all our hearts.

Staff Changes.—Since our last notes appeared several staff changes have taken place. Mr. J. C. Dalziel came to us in August last as Higher Clerical Officer on promotion from Scotland West vice Mr. J. C. Macdonald, promoted to Scotland West as Chief Clerk. Mr. Dalziel's stay, unfortunately, was not of long duration, as he found the salubrious (?) air of Manchester was not of the best for his health, he has therefore departed once more for the "land o' cakes," this time to Edinburgh. Mr. Macdonald, on his departure, was presented by the District Manager (Mr. J. T. Whitelaw), on behalf of the staff, with a canteen of stainless cutlery.

Mr. R. German, Assistant Traffic Superintendent, has been transferred to Headquarters Traffic Section. He was the recipient of a number of gifts from the staff especially suitable to a young man leaving his "spiritual" home.

We welcome Mr. R. H. Diggles, Higher Clerical Officer, who came to us on promotion from Liverpool in October last, and our congratulations are tendered to Mr. C. Fallows, Clerical Officer, on his promotion to Higher Clerical Officer at Manchester vice Mr. Dalziel.

Miss B. Sandham, Writing Assistant, has left us to take up other duties as a married woman. She was very popular amongst the staff, as evinced by the large number of individual presents given to her, as well as a farewell token of esteem and goodwill from the staff consisting of a very pretty tea service and a set of spoons.

Civil Service Commission.

Forthcoming Examinations.—Male Assistant Superintendent of Traffic (Class II) in the London Telephone Service and Male Assistant Traffic Superintendent in the Provinces, General Post Office (18—23, with extension for service in H.M. Forces).

Regulations and particulars, together with the forms on which applications must be made, will be sent in response to requests (preferably by postcard) addressed to the Secretary, Civil Service Commission, Burlington Gardens, London, W.1. The latest date for the receipt of application forms is 6th March.

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WHERE TO STAY.

BOURNEMOUTH.—"Kelham" Boarding Establishment.—Conveniently and most pleasantly situated. Near sea, Shops, Gardens, Cars. Special terms for P.O. & T. & T. workers. Terms moderate.—Stamp for reply, Mr. and Mrs. Ernest Jones, 9, Walpole Road, Boscombe.

FOREST OF DEAN.—SEVERN-WYE VALLEYS.—BEAUTIFUL HOLIDAY HOME (600 ft. up). 80 rooms, extensive grounds, motors, golf, billiards, tennis, bowls, croquet, dancing. Electric light. Boarders 52*s.* 6*d.* to 70*s.*—Prospectus: Littledean House, Littledean, Glos.

BOARDING SCHOOLS and Colleges in England, any district.—ALL CLASSES, Boys or Girls. Fees from £40 to £200 yearly. Full particulars supplied to parents free; state your requirements—F. LAVELL BATTEN (T.T.J.), Scholastic Agent, 93-94, Chancery Lane, London, W.C.2. 'Phone, Holborn 6105.

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GLASGOW TELEPHONE NOTES.

BY the time these lines are in print, Mr. George C. Dewar, of the Accounts Section at this Office, will have taken up duty at Birmingham on his promotion to the Higher Clerical Grade. Mr. Dewar, whose portrait we give

MR. G. C. DEWAR.

above, entered the service of the National Telephone Company in June, 1902, and the Post Office at the transfer in 1912. By his wide experience of telephone accounting matters, he is well fitted for the duties of the new position. His colleagues at Glasgow congratulate him on his promotion, and tender their best wishes for his future success.

The Glasgow Trunk Exchange Staff gave the inmates of the Bellahouston War Hospital a most enjoyable evening's entertainment on the evening of Dec. 13 last. The proceedings commenced with a high tea followed by a whist drive and musical items. It is perhaps somewhat unfair to mention names, as so much of the success of an evening of this kind depends on the workers behind the scenes, and they are thanked equally with those who came more directly under the "public eye." Miss Heron's comic songs and impersonations were greatly enjoyed, also Miss Meikleham's singing. Mr. Scantlebury manipulated the piano with skill, and Mr. Hunter (Assistant Traffic Superintendent) acted as an efficient M.C. Mrs. E. J. Johnson presented the prizes for whist. Amongst those present were Mrs. and Miss Coombs (the District Manager would have been there but was on official business in London), the Traffic Superintendent, also Miss Cameron, Supervisor, Central Exchange, Miss Kay, Supervisor, Trunk Exchange, and others, who all added to the success of the evening by making up Whist parties and in other ways helping to entertain the guests. The thanks of the boys in blue were voiced by Mr. Furie, one of their number, who spoke in very appreciative terms of the pleasure given by these efforts of the Staff of the Post Office.

On the occasion of his leaving for Guildford, Mr. A. E. Higgens, Assistant Traffic Superintendent, who came to Glasgow as a trainee 3 years ago, was presented with a "Revelation" travelling case by his colleagues of the Glasgow Traffic Staff, as an expression of good fellowship. The presentation was made by the District Manager, Mr. A. E. Coombs, who, in a racy speech, summed up "Arthur" as the "Peter Pan" of the Traffic Branch and referred to the unusual popularity he had attained in his short sojourn amongst us. Mr. Coombs predicted a successful career in the Service for Mr. Higgins, and feelingly conveyed to him all the good wishes of the Glasgow Staff.

The staff of the Giffnock Telephone Exchange held their first Annual Dance in the Marlborough House, on Friday, Jan. 10, where a gathering of over 100 spent a most enjoyable evening. Mr. Johnson (Traffic Supt.) and Mrs. Johnson were unable to attend. Mr. J. B. Smith, Contract Officer, performed the duties of M.C. in an agreeable and efficient manner. The Dance Committee are to be congratulated on their successful arrangements.

The Whiteinch U.F. Literary Society, advertising a telephone demonstration and lecture by Mr. A. E. Coombs, for Monday, Dec. 9, made a novel abbreviation, and incidentally awarded the District Manager a new degree. The announcement of the lecture read as follows: A Lecture and Demonstration on "The Telephone Service from Within," by A. E. Coombs, P.O.T., Glasgow.

Quite a big "pot," in fact.

First Impressions.

The report of a short visit to the Central Exchange, Glasgow, by a new entrant in the course of training for duty as a Contract Officer.

ON entering the Central Telephone Exchange, one is amazed, and, to the unititated, this enormous undertaking has a very complicated appearance. After a tour round under the able guidance of Mr. Wilkins, everything is explained away, and through the efficiency of the staff a wonderful system becomes simplified.

In the operators' room there are three boards: "B" (Junction Board), really the gateway of the exchange; "A" Board, where all central area subscribers' calls are dealt with; and Monitors' Board, whereat all complaints, &c., are attended to by the Supervisors.

Considering the number of calls dealt with by this exchange, 60,000 a day, each operator accounting for, on an average, 140 an hour, the one thing that struck me most was the entire absence of noise. This, I think, is due principally to the wonderful lighting system, these supervisory lamps (white) indicating to operator when a subscriber is calling and also showing the state of connexion; in passing I also noticed that when a public call office call comes through a red light is shown. On asking where all the power came from, enabling this wonderful system to be worked, I was taken to another room and there shown batteries charged by generators, one battery and one generator working, the other being held in reserve, thus safeguarding the chance of breakdown. This is really the heart of exchange.

The Main Distribution Frame is an education in itself; there we have cables (containing thousands of wires) joined up. These cables are teased out and joined up in any order in the M.D.F., from these they are jumpered out into numerical order, relayed across to the Internal Distribution Frame, and thence to the operators' board. I have often wondered how a record of all calls made by a subscriber could be kept with any degree of accuracy, but the meter system soon explained this.

Being my first visit to an exchange, it has been a very instructive one, and also one that I am never likely to forget. It has also placed me in a position whereby I am able to smooth over any minor complaints that are sometimes made by telephone users.

BEN MCARDLE.

NEW YEAR'S MEET OF C.T.O. PENSIONED OFFICERS.

ON Jan. 8, at the usual rendezvous in London, all but one hundred pensioned officers of the C.T.O. assembled to celebrate their survival of retirement dangers through another year. The chair was taken by J. Bailey, Esq., I.S.O., who seemed well-pleased with his easy task, and who parried the "lunges" of speakers who made reference to his past, with his usual disarming smile! Mr. C. S. Keen, indefatigable as ever, splendidly seconded by Mr. H. Adams, were responsible for the organisation, which included a dainty 5 o'clock tea, for which the Express Dairy were responsible. Mention is made of the actual caterers in order to assure present-day C.T.O.-ites of the high standard of respectability of the rendezvous itself! Several who had promised to attend were unfortunately prevented from so doing at the last moment by personal or domestic stress or other causes. Among the latter, Mr. A. W. Edwards' jovial presence was missed, due to eleventh-hour calls upon his time. One does not forget that he is a life-governor of Bart's. There seemed a rather heavy list of those who had fallen by the way during the last six months, but reassuring news of others, Adam Gordon, for example, relieved the shadows that were inevitable.

The speeches were as usual mostly reminiscent of the "dear dead days beyond recall," when it would appear boys and young men were no better than those of to-day. In fact, one rather estimates latter-day youth have somewhat improved their manners. Leastways, the writer is perfectly certain that never during its entire existence have the present patrons of the C.T.O. Operatic and Dramatic Society witnessed the unenviable sight of one of the principle characters being dragged off the stage, having imbibed too freely. Such was, however, the story of the St. Martin's Amateur Theatrical Society in the "good old days"!

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This is not *typical* of the recollections of the veterans, of course, but from "grave to gay, lively to severe" went the tales, until with musical honours for the two organisers and many a hearty hand-shake and good-bye, we parted one from another.

It is claimed that the number present is a record in Civil Service department pensioners' meetings of this character. The 97 names now follow, and should prove of considerable interest to C.T.O. readers especially :—

Messrs. W. W. Abrey, G. Adams, H. E. Adams, T. J. Allison, S. R. Ashby, B. G. Askew, J. Bailey, I.S.O., J. Bearman, T. G. Beavis, H. E. P. Bell, G. T. Bennett, C. Bent, E. Bird, C. J. Boulton, H. J. Broughton, J. A. Buffin, F. W. Butler, W. J. Callow, T. W. Charter, Capt. A. J. Cherry, M.C., Messrs. A. J. Condy, J. H. Couldrey, E. M. Diaper, H. G. Dicks, J. W. C. Duncan, C. Elphick, H. W. Evans, C. J. Faunch, F. J. I. Fischer, W. S. Fisher, E. Fulcher, F. J. Furby, R. A. Furness, P. Garrood, J. N. Geary, W. E. Gibbons, A. T. Good, J. Gough, E. C. Govier, T. W. Gunter, W. Haggerty, A. Hardman, F. W. Harrison, C. Heywood, F. Hicks, G. H. Hickman, E. L. Hilton, S. K. Hiscox, S. M. James, G. Janes, A. E. Johnson, D. W. Jones, W. E. Jones, A. W. Judd, C. S. Keen, R. E. Kemp, G. F. A. Lange, E. Lewis, C. R. Lowe, A. W. F. Ludlow, J. J. Mansell, F. W. Miles, C. J. Minors, F. Mitchell, A. Morgan, F. J. Muller, R. H. Mulock, *H. Oakman, S. F. Pace, H. Pond, E. F. Poole, W. S. Read, J. Rees, L. C. M. Rowan, C. Sanderson, J E Sayers, H. W. Senhenn, S. T. Shapcott, A. F. Simmons, J. G. Smith, S. J. Smith, C. W. Sparkes, H. C. Stelbom, E. J. Stone, J. H. Sherrington, G. E. Taylor, W. J. Town, H. Trollope, C. J. Turner, W. Turner, J. J. Tyrrell, E. Veale, E. A. Ward, W. A. Webster, H. B. Winder, W. G. Wood and C. E. Wright (also late E.-in-C.O.).

* Since compiling this list it is regrettable to state that Mr. H. Oakman passed away after but a brief illness only a few days following this meeting.

J. J. T.

LEEDS DISTRICT NOTES.

Retirement of Mr. G. S. Wallace, Assistant Superintending Engineer.—On Wednesday, Jan. 15, a Social Evening was held at the Guildford Hotel, Leeds, when a wireless set was presented to Mr. Wallace as a token of regard from the staff generally of the North-Eastern District. The Chair was taken by Mr. J. W. Atkinson (Superintending Engineer), and among those present were the following gentlemen: Lt.-Col. Jayne, D.S.O., O.B.E., M.C. (Postmaster Surveyor); Messrs. R. Alexander and J. Shea (Assistant Superintending Engineers); F. G. C. Baldwin (Assistant Superintending Engineer, Newcastle); E. S. Francis and W. W. B. Crompton (Executive Engineers); S. A. Pickering (Staff Officer); J. N. Lowe (Contract Manager); T. B. Johnson (late Superintending Engineer); E. H. Farrand (late Executive Engineer); and H. B. Sutcliffe (late District Manager), and a representative number of the District Staff.

Mr. Wallace has had a varied career, having been closely connected with the Telephone Service practically since its inception. He commenced in 1883 as a Day Operator with Messrs. Tasker's, Sheffield. About the end of 1884 he took the position of Test Clerk at Sheffield Telephone Exchange, subsequently becoming Chief Clerk and Assistant Secretary. In 1890 he was appointed Chief Inspector with the late National Telephone Co., Ltd., at Leeds, and in 1897 became that Company's local Manager at Halifax. He, however, left the Telephone Service in 1901, becoming the Mains Superintendent with the Halifax Corporation Electricity Department, which position he shortly afterwards relinquished to take over the management of the Tunbridge Wells Corporation Telephone Department. This post he held until that concern was absorbed by the National Telephone Co. in 1903, when he became Local Manager at Bradford. In 1905 he was appointed Chief Electrician at Manchester, and, on the acquisition of the National Telephone Co., by the State in 1912, became Executive Engineer, which position he held until his promotion to be Assistant Superintending Engineer at Leeds in 1924. During his career at Manchester Mr. Wallace was responsible for the organisation and conversion of the Manchester telephone system from Magneto to C.B. working.

A large number of those present, including the Chairman, testified to the esteem, both as an official and as a friend, in which Mr. Wallace was held, and one and all wished him and Mrs. Wallace the best of health and happiness during his retirement, one speaker (already on the Retired List), aptly welcoming him as a recruit to the "Seven Days a Week Rest Society."

The formal presentation was made by Mr. E. S. Francis with musical honours, after which Mr. Wallace suitably responded.

An interesting and varied musical programme occupied the remainder of the evening, the artists being: Miss Pollard and Messrs. McElvie, Farndale, Galt, Bailey, Worth and McDougall.

A very successful evening was concluded by the singing of the National Anthem.

Promotions.—Mr. J. Shea, Executive Engineer, Leeds, has recently been promoted to be Assistant Superintending Engineer, N.E. District, Leeds, vice Mr. Wallace, superannuated; and Mr. W. W. B. Crompton, Assistant Engineer, London, to be Executive Engineer vice Mr. Shea, *pro tem.* The congratulations of the staff are tendered to these gentlemen.

B.B.C.'s North Regional Station.—Wireless "fans" in the North are keenly interested in the progress of the new North Regional Transmitting Station which is at present being erected on about 30 acres of land at Moorside Edge, approximately two miles north of Slaithwaith (pronounced Slowit !). The following details regarding the station have been kindly communicated by the Chief Engineer of the British Broadcasting Corporation :—

"The station buildings will be similar in outline to the buildings erected at Brookman's Park for the London Regional transmitter, but the mast system will consist of three 500-ft. masts place in triangular formation, one mast being common to both aerials. This arrangement is different from that obtaining at Brookmans Park, where there are four masts and where the two aerials are on opposite sides of the building.

The station buildings will house two transmitters, differing only in detail from those working at Brookmans Park. Each transmitter will be capable of delivering 50 kw. into the aerial, the well-known system of low-powered choke modulation being employed. The high tension supply for the transmitters will be obtained direct from D.C. generators, other generators being available for filament current supply and grid negative. Power will be obtained from Diesel engines, the power house being situated at the far end of the station buildings. An accumulator battery will be available for handling the lighting and heating load of the station when the engines are not running, and to enable the station to be run on full power for a short period in the event of a failure of the engines.

Telephonic communication is being established with the Manchester studios by means of circuits in the new Manchester-Huddersfield screened cable, a new cable being laid from the cable route through Slaithwaite to the station site. Four music circuits and one control circuit will be available."

West Yorkshire Telephones Benevolent Fund.—The number of contributors to the Benevolent Fund last year reached the splendid total of 400. The Fund, which has now £500 invested in War Stock, has been of great assistance in many cases of distress amongst the Engineering and Telephone Operating staffs, where the pressing need was for immediate financial help to tide over a period of exceptional difficulty, usually due to the illness or death of the bread-winner. Many of the cases dealt with eventually came under the care of larger organisations than that of our little Fund, but the machinery of these organisations of necessity takes time to operate, and on the principle that he gives twice who gives quickly, it can truly be said that the £200 which our Fund has so far disbursed does not represent the measure of the help which it has been able to give.

Leeds Post Office Football Club.—The progress made by the football team since our last notes is indicated by the results—8 games played, 4 won, 1 drawn, 3 lost, goals for 23, goals against 15.

In the first round of the Lancashire and Yorkshire Postal Cup the team plays Bradford P.O. at Roundhay (home ground) on Jan. 29.

Christmas Greetings ! !—

"Postman ! Postman !"

"Yes, madam" (walks back long garden path).

"Are you the *regular* postman ?"

"Yes, madam."

"Then you are the one that broke the latch on the garden gate."

The Christmas Dinner held in the Bradford Exchange staff dining-room was voted a great success. The kitchen staff had risen nobly to the occasion and the strength of the rum sauce was held responsible for the conversion of "the voice with the smile" to "the voice with the giggle."

Culled from the Calendar.——

"It is not what you start that counts, it's what you finish."

"Make use of your opportunities; in life there is no moving staircase to take you to the top while you stand still."

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LONDON TELEPHONE SERVICE NOTES.

Contract Branch Notes.—The business done by the Contract Branch during the month of December resulted in a net gain of 1,979 stations as compared with 2,404 last year. Increased ceasements due to bad trade, and so on, proved too much for us and even an increase in the gross new business was insufficient to prevent a drop in the net gain.

We have had two or three record months for completing new kiosks and by the time these notes appear there will be over 1,600 working in London. The number actually in use on Dec. 31 was 1,581 and there were outstanding advice notes for 149 more.

The Five-Power Naval Conference has provided a great deal of work for certain members of the Contract Branch, especially the one who was appointed to the Committee to look after the comfort and the convenience of the delegations. An appreciable number of private branch exchanges and various complicated installations have been provided, with suitable reserve facilities to meet emergencies, and it is hoped that a full description of the arrangements made and the facilities provided will be included in a later issue.

Those who know Mr. Luetchford in the South-East Contract Office will be very glad to learn that he is getting better from his long and serious illness and that he has great hopes of leaving hospital very shortly. Our best wishes to him for a speedy recovery.

Our congratulations to Messrs. J. Fox and B. J. Grafham on their promotion to Contract Officer, Class I.

Obituary.—It is with the deepest regret that we have to record the death of Mr. J. A. Stuart, Contract Officer, London Telephone Service, who passed away, after a painful illness, on Dec. 29 last.

"Jimmy" Stuart entered the service at a somewhat advanced age and on that account was debarred from the benefits of establishment; but during his 20 years' service he earned the esteem of all who knew him, and his untiring interest in his work undoubtedly contributed to the delay in seeking medical aid until his physical condition had gone beyond recovery.

Though one whose voice was seldom heard, his kindly manner, good nature and patience under difficulties endeared him to all who came in contact with him.

The interment, which took place at Finchley Cemetery on Jan. 4, was attended by colleagues from the London Contract Offices, and wreaths were sent by the indoor and outdoor staffs.

L.T.S. Bowls Section.—The London Area Association met at Treasury Chambers on Friday, Jan. 10, and the important business of arranging fixtures for next season was successfully accomplished.

The L.T.S. team are, of course, chiefly interested in the 1st Division, which varies this year as compared with last year, by the substitution of the 4 bottom clubs by the 4 top clubs promoted from the B division. The newcomers to the League are: Admiralty, A.G.D., C.T.O. and Headquarters.

Fixtures for 1930.

April	28,	1930.	Captain and Vice-Captain,	at Chiswick.
May	1	„	Headquarters	(League) „
„	8	„	A.G.D.	„ „
„	21	„	C.T.O.	„ „
June	5	„	Customs & Excise	„ „
„	18	„	L.P.S.	„ „
„	27	„	S.B.D.	„ „
July	8	„	Admiralty	„ „
Aug.	21	„	Engineers	Friendly „

The Green opens on April 26, and another interesting date fixed was the final for the Bunbury Cup which will be played this year on Wednesday, Sept. 10.

This year the Civil Service Championships will be played in Scotland during the week commencing July 21.

L.T.S. Football Club.—Only two matches have been played since the last notes appeared under this column and one of these, which took place at Chiswick on Saturday, Jan. 11, against the Board of Education had to be abandoned at half-time owing to the severe weather, with the L.T.S. leading by 5 goals to none. There is little doubt that this match will have to be replayed.

In the Challenge Cup 1st round, against the Customs, on Jan. 4, the L.T.S. recorded an easy victory by 7 goals to 1. Buckley had another great day, scoring 4 goals.

L.T.S. Notes.—Captain E. F. Arthur.—By the time these notes appear, Captain Arthur should have taken up his duties as Head Postmaster of Bangor and the L.T.S. will be the poorer by his transfer. During the major part of his service in the L.T.S. he has been associated with the Development Section and has seen this section grow from the "man and boy" stage (at which time our friend was the "boy") to the important place which the section occupies to-day in the London organisation. During his service in the L.T.S., which commenced in 1908 as a Third Class Clerk, Captain Arthur has been generally popular and in many ways has demonstrated his real ability in the manner in which he has handled the varied types of cases which in these days fall to the lot of a "Proposals" Officer. During the war he received a Commission in the Welch Regiment, attained the rank of Captain and Adjutant and was mentioned in despatches.

Apart from his official duties he has done much to promote the cause of further education in the L.T.S., and has been a member of several London Committees connected with the promotion of this work. He has been a regular contributor to this Journal through the medium of the "Contract Branch Notes" for some years. In the world of sport, tennis, badminton and golf have claimed his attention, and in this connexion it is understood that there is a tennis club at Hampstead which, in losing the services of a zealous hon. secretary, is not too enthusiastic about his appointment.

The staff at Bangor are to be congratulated on the choice of their new chief, who leaves London with the best wishes of his colleagues for his future.

A representative gathering of L.T.S. men and women assembled in the Conference Room at Cornwall House on Jan. 7 to say good-bye and to wish their colleague, Captain John Webb, M.C., every success on the occasion of his departure for Egypt to take up the position of Telephone Superintendent with the Egyptian State Telephone Service. The Controller, Mr. Napier, on behalf of Captain Webb's many friends in the Service, presented him with a gold watch and chain and other tokens of esteem, and spoke in eulogistic terms of the manner in which Captain Webb had filled various positions in the London Telephone Service, and referred particularly to his work in connexion with the introduction of automatic exchange working. Mr. Dive, the Assistant Controller, delighted the gathering with a racy contribution delivered in his own inimitable fashion, and Captain Webb, in reply, modestly attributed much of his success to the loyal support he had received from his assistants. We understand that Captain Webb has contracted for a five-year period, with the possibility of further extension. We wish him every success.

National Sanatorium, Beneden.—The first of the series of Winter Concerts provided by the L.T.S. was held on Dec. 28, 1929.

As on many previous occasions Miss Worth undertook the direction and again it proved very successful. Some old friends and one or two new recruits assisted, and it was declared by the staff and patients to have been another tribute to the efforts put forward by the L.T.S. staff.

The Concert opened with a couple of community singing numbers, followed by a request song rendered by Mr. Hugh Williams—"Take a Pair of Sparkling Eyes" (Sullivan). An encore was demanded, and "My Dreams" (Tosti) appeared to have given equal pleasure. Miss Beare then sang a carol entitled "Birds," by Belloc, and received a wonderful reception. An old favourite at the "San" is Miss Beare, and of course she was not allowed to leave without an encore. Charles Conyers followed with a humorous item. He kept the audience roaring with laughter and responded again and again to the demands for more. Next followed a duet, "The Miserere Scene," from "Il Trovatore," by Miss Nellie Beare and Mr. Hugh Williams, followed as an encore by that charming duet, "Flowers that Sing." Mr. Arthur Hider sang "The Floral Dance," and his first appearance at these concerts leads us to hope that he will come to our assistance on some subsequent occasion. His item and encore were received with warm expressions of appreciation. The quartettes, "Pro Phundo Basso," "The Torpedo and the Whale," and "The Regular Royal Queen," by Misses Beare and Worth, Messrs. Hugh Williams and Arthur Hider, proved very popular numbers. Miss Margaret Worth sang "Love's Old Sweet Song," and she evidently knew her audience, for the chorus was taken up with gusto. Messrs. Williams and Hider caused a good deal of amusement with their version of Offenbach's "Two Gendarmes," and in response to an appeal for more, sang "The Moon hath Raised Her Lamp Above" (Benedict). Further songs by Miss Beare and Mr. Hider and a ventriloquial sketch by Mr. Conyers, with his "Saucy Willie Winks," brought the programme to the final item. This took the form of a community duet, "The Keys of Heaven." Under the guidance of Mr. Hugh Williams the gentlemen sang the "invitation," and Miss Beare instructed the ladies when to say "Nay" or "Yea." The singing of "Auld Lang Syne" brought a very happy and enjoyable evening to a close. Cigarettes, chocolates and biscuits were then distributed to the patients, all of whom expressed gratitude to the L.T.S. staff, and a vote of thanks was accorded Miss Worth and the artistes.

As usual, the hospital staff provided an excellent tea and supper for the artistes. Before leaving Mr. Hugh Willaims claimed the privilege once again of thanking the matron and her assistants for their kind hospitality, and referred to the pleasure it gave them to find amongst the audience and at the supper table two such indefatigable workers in the cause of the Sanatorium as Mr. Durrant and his colleague, Mr. Trollope.

We congratulate Mr. C. D. Iliff on his promotion to the grade of Assistant Superintendent of Traffic, Class I. Mr. Iliff's genial disposition and never-failing courtesy have endeared him both to his colleagues and the staff of which he has had control. We are sure that the promotion will prove highly popular and that the success which has attended his ventures in the past will continue unabated in his new sphere.

May he never forget the "Service" by "Design."

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A BRIEF CHRONOLOGY FOR STUDENTS OF TELEGRAPHS, TELEPHONES AND POSTS

BY HARRY G. SELLARS.

(*Continued from page* 60.)

1890, Mar. 1 ... Rogers obtained a speed of 200 w.p.m. with a telegraph printer constructed on the principle proposed by Vavin and Fribourg.

Nault, of France, proposed a system of perforating Hughes signals, the tape at the receiving end to be reperforated and run through a local Hughes apparatus.

International Postal Union, in Brussels, dealt with payment of subscriptions to newspapers through the post.

Post Office Committee recommended abolition of re-direction charges in Inland Postal Service.

Decided that, in extending deliveries to places unserved, ¾*d.* should be credited for each letter and 1½*d.* for each parcel.

1890, Dec. 9 ... Bell's patent of the membrane telephone receiver expired.

Letters delivered by British Post Office 1,650,000,000.

Post Office Savings Bank Depositors 4,248,000, deposits £59,000,000.

1891, Jan. ... Prof. Ewing experimented in connexion with the molecular theory of magnetism.

1891, Feb. 1 ... Railway letter service, under which letters not exceeding 1 oz. might be handed in at a passenger station for immediate transmission by train, was established. An additional fee of 2*d.* was charged by the Company.

A. C. White patented in America a common battery system for telephone working.

1891, Mar. 25 ... Express Delivery Service established in London.

1891, April 1 ... London-Paris Telephone Service opened to the public. The special cable laid was designed by H. R. Kempe.

Swinburne constructed his "Hedgehog" current transformer.

National Telephone Company's adhesive stamps withdrawn at the request of the Postmaster-General.

Dry core cable first used in England.

1891, June 1 ... Separate insurance for parcels abolished and substituted by registration coupled with insurance. For registered inland letters and parcels fees ranged from 2*d.* for £5 to 6*d.* for £25 compensation.

Limit of compensation for unregistered parcels raised to £2. Charge of 2*d.* for advice of delivery of any Inland registered postal packet introduced.

1891, July 30 ... Edison telephone transmitter patent expired.

Insurance up to £50 for parcels extended to British Colonies.

Maximum limit of deposit in Post Office Savings Bank raised to £200.

1891, Aug. 1 ... Express Delivery Service extended to rest of United Kingdom. Messengers could be summoned by telephone, and letters could be dictated to a Post Office for delivery. Local "Express" services conveyed parcels and letters from sender to addressee.

Wilhelm Eduard Weber died.

International Postal Union, in Vienna, dealt with postcards, counterfeit postage stamps, the use of the International Bureau at Berne for liquidating international postal service accounts, &c.

Act of Parliament empowered rural sanitary authorities to guarantee telegraph offices and to meet the cost out of rates. Telegraph system in rural districts extended.

J. Poole published "The Practical Telephone Handbook."

[NOTE.—The item referring to "The Practical Telephone Handbook," dated July, 1880, should be erased. This useful work was first published in 1891.]

1891, Dec. 21 ... S. P. Thompson suggested the use of inductive shunts and transformers in telephone circuits.

London theatrical performances transmitted by telephone to Birmingham.

Raikes revision of Post Office wages.

1892, Jan. ... Clerks from certain Post Offices attended at schools to open Savings Bank accounts for children. £40,000 deposited in this way during the year.

Sir William Crookes foreshadowed wireless communication.

1892, Feb. 3 ... 600 words a minute received on Wheatstone receiver on a racing circuit from Leicester serving simultaneously London, Birmingham, Manchester and Liverpool.

1892, Mar. 1 ... Inland Telegraph Money Order system extended to all telegraphic Money Order offices with fees ranging from 4*d.* for £1 to 1*s.* for £10, in addition to the charge of at least 9*d.* for the telegram and its repetition.

1892, Mar. 21 ... Deputation from the London Chamber of Commerce, headed by Sir Albert K. Rollit, met the Postmaster-General with a resolution expressing the view that facilities should be provided for the development of the telephone "whether by private companies or the Government themselves." A statement in the House of Commons was promised.

1892, Mar. 22 ... Postmaster-General (Sir James Fergusson) in the House of Commons opposed the Bills presented by the National Telephone Company and the New Telephone Company in which very extended powers were sought. He said it was essential that the Government should own the trunk wires.

1892, Mar. 29 ... Dr. Cameron, in the House of Commons, moved that "the telephone monopoly possessed by the Post Office should be worked directly, and in connexion with the Postal Telegraph Department." The motion was lost by a majority of 58.

1892, Mar. ... C. A. Stevenson, of Edinburgh, suggested a "coil" system of wireless communication between ships.

1892, Apl. ... Prof. J. J. Thomson showed that the surface of contact between two non-conducting surfaces is the seat of a permanent difference of potentials.

1892, May ... H. M. Crane and Hammond V. Hayes (U.S.A.) devised common or central battery systems. Experimental common battery telephone exchange established in Boston.

1892, May 23... Treasury Minute outlined policy of the Government in relation to telephone trunk wires and future licences.

1892, May 27... Bill presented to Parliament authorising the Post Office to acquire and erect trunk telephone lines and to grant licences for the establishment of local exchanges.

House of Commons passed a resolution extending daily deliveries of letters to places where they were not in force.

1892, June 4 ... Willoughby S. Smith and W. P. Granville patented an inductive method of wireless communication.

1892, June 16 Telephone Bill referred to a Select Committee of the House of Commons.

1892, June 18 Strowger patented an improvement of his automatic telephone system.

Western Electric Company produced self-restoring indicators for telephone switchboards.

1892, June 28 Bill for raising £1,000,000 for purchase and extension of the trunk telephone system passed House of Commons.

M. E. Branly noticed that metallic filings acquired a better electric conductivity when an electrical discharge takes place near them.

1892, July ... Sir Oliver Lodge arranged a form of parabolic mirror with vibrator and receiver, and proved the possibility of emitting and receiving parallel beams of electric waves by reflection.

1892, Aug. 1 ... International Express Service commenced.

1892, Aug. 11 Heads of arrangement for the sale of telephone trunk wires initialled by Sir James Fergusson, Postmaster-General, and J. S. Forbes, on behalf of the National Telephone Company.

1892, Sept. 1... New series of Postal Orders issued endorsed with the words "Not Negotiable."

Sir William Thomson became Baron Kelvin, of Largs.

Hughes duplex telegraph installed between London and Amsterdam, Antwerp, and Brussels.

(*To be continued.*)

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THE

Telegraph and Telephone Journal.

VOL. XVI. MARCH, 1930. No. 180.

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All correspondence relating to advertisements should be addressed to MESSRS. SELLS, LTD., 168, *Fleet Street, London, E.C.*4.

TELEGRAPH AND TELEPHONE MEN AND WOMEN.

LXXIII.

MR. CHRISTOPHER FEARNHEAD MOORHOUSE.

MR. MOORHOUSE was born at Canterbury in 1872 and educated at St. Bonaventure's Grammar School, Forest Gate. His connexion with the telephone service dates as far back as December 1886, when he entered the United Telephone Co. On the amalgamation of the United with the National and Lancashire and Cheshire Companies he was appointed Assistant Cashier, and subsequently became an Assistant Engineer in the Regent Street district of London. Rising to the position of Local Engineer and Local Manager for the Paddington and Kilburn district, he was appointed District Manager for the Eastern District of London in 1899. On the decentralisation of the London districts, Mr. Moorhouse was appointed Divisional Engineer for the South-East and South-West, and, later, Contract Manager for the whole of London. From thence he was transferred to Brighton in 1906, subsequently becoming District Manager for that district, a position which he still occupied at the time of the transfer of the National Company's system to the Post Office. In April 1919 he became District Manager of Telephones for Reading, a position which he still fills. During that period the number of telephones in the Reading District has more than trebled, having increased from 11,671 to 40,499.

Mr. Moorhouse has been described as a good all round man with resource and plenty of tact, always an invaluable quality in a district manager. We have heard that he is fond of music and gardening, and adds to these tastes a penchant for collecting old china and the pursuit of Freemasonry. He is keenly interested in all questions concerning the staff.

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HOW TO IMPROVE THE TELEGRAPH SERVICE.

(FROM A GERMAN CORRESPONDENT.)

THE articles of the *T. & T. J.* from March till December, 1929, concerning the improvement of the English telegraph service are very interesting not only to English people but also to foreigners. The opinions of the authors being different one from another in some of the main points of view are able to shed light on the questions and suggest how to improve this service. By opening the columns of this paper to their respective proposals, the editors of *T. & T. J.* merit praise, particularly at the present time, when telegraphs do not pay and are not satisfactory in any country of Europe. We foreigners, when reading these proposals, have to reflect in which regard our telegraph service differs from the English service, consequently the English proposals are of more or less value to the foreigners.

The principal point of view of all considerations is to state what will be the future of the telegraph service. The public telegraph traffic is everywhere greatly and perpetually declining. The main reason for this decline is the competition of the telephone; the number of telephone stations is growing very fast, the extension of speaking possibilities becomes greater, especially in consequence of the laying of underground telephone cables, besides which the quality of telephone transmission is constantly improving. You can thus get a telephone connexion for a longer distance within a considerably shorter time than formerly. By this development much traffic is drawn more and more from the telegraph to the telephone. I do not believe this evolution in favour of the telephone is yet ended.

In order to find out the future of this evolution and the level of telegraph traffic, one needs to examine the different kinds of telegrams.

Till now the telegraph has been most used when the sender or the receiver has no telephone, i.e., is not a telephone subscriber. But at present you find more and more public call-boxes in the streets and in the restaurants, &c., where non-subscribers can telephone any time of the day or night to subscribers. Or, if the person phoned up is not a subscriber, he can be called by the telephone office to a public call-box to be connected with the caller. The number of public call-boxes has grown very considerably and quickly, and simultaneously the number of non-subscribers has much diminished. The consequence of this development will be a further decline of this kind of telegram.

Besides, to-day one uses the telegraph service when one wants to have a written message as a confirmation of a telephone conversation or an agreement or when sending numbers or code words to avoid telephone mistakes. Telegrams of this kind originate mostly from bankers, great firms, &c. I believe this kind of telegram will become more scarce, because the best customers of this kind of telegraph service take private lines in increasing numbers and correspond directly with one another on these private lines, as the newspapers have long done. This will be possible when the future development of the harmonic telegraph or frequency telegraphy or similar installations will be able to give enough telegraphic channels for these purposes between the respective towns and subscribers at a low rate. The Government has but to procure the telegraphic lines or channels and will no longer have to transmit the telegraph messages of these customers.

Perhaps within a short time we shall have constructed an apparatus as supplement to the telephone apparatus for telegraph service; on the same line we shall telephone by the telephone apparatus and then, when we want to have a written confirmation of this conversation, we shall switch on the supplemental apparatus and be able to telegraph and write the main points of this conversation. By that system the Government will not need to procure a line or a channel nor to operate messages.

Perhaps it will be possible to develop further the existing type of apparatus so that it would be connected with the line during the conversation and would register all sounds and words of the telephone conversation upon a cylinder simultaneously. By this system the Government would not need to provide battery or other equipment, as is the case with the present system. This cylinder-apparatus can be bought by the telephone subscriber; no other special installation would be required.

Actually, the telegraph service is often used for a long-distance message, instead of the telephone; for a long-distance telephone conversation you have usually to wait longer and to pay much more than when telegraphing. But by the measures taken by the governments, the number of telephone lines is perpetually increasing, which will shorten the time of waiting for telephone conversations. Also, the quality of speaking is improving, even for long distances, and the fees for telephone conversations for long distance are showing a sinking trend. Therefore, after a short time, the advantages of the telegraph for a business man in comparison with the telephone will have disappeared in that regard and simultaneously that kind of telegram.

What remains for the telegraph service in future? When you only want to send a quick message without expecting an answer—for instance, for ordering a hotel room, for announcing an arrival, for greetings, &c., or when you have not time enough to wait for a telephone connexion—then you will telegraph even in future. This kind of telegram will remain, but I do not believe that this form of correspondence will be of great extent.

Beside the telephone we find another enemy to the telegraph; it is the postal service. The postal service, also, has greatly improved the speed of transport and delivery by using the most rapid modern trains, the aeroplanes and zepps. To-day, when you send a letter in the evening, it is delivered the next morning at almost every town, not only in the same country but also in the capital towns of other neighbouring countries. By using these means of communication you are able to have the messages in the hands of the addressee very quickly and very cheaply, and these messages can be much more voluminous than is possible by using the telegraph. We see that this development also will damage the telegraph domain.

When we consider the future of all these different kinds of telegrams, and when we appreciate fully the immediate future development of the telephone and postal service, it is clear that telegraph traffic *must* sink further to a lower level. We see that the reasons for this sinking are quite natural and cannot be removed by any measures of the governments; it is not the deficiency of public confidence in the telegraph system and not a depression of trade and business which causes the diminution of telegraph traffic. The technical development has created new means of communications, such as the telephone, the aeroplane, the zepps, and the business man is obliged to use the natural advantages of these new means and to refuse means like the telegraph which cannot offer the same modern advantages. This progression cannot be restrained. Therefore, all proposals for drawing back again the traffic from telephone to telegraph or for restraining the present telegraph traffic from passing over to the telephone, &c., are useless and bound to fail.

The sole duty of the telegraph service remains to-day to improve the speed of transmission and delivery of the telegrams in order to furnish the best means of communication for that kind of traffic where the telegraph is still used, as I have explained, and to consider that this future telegraph traffic will be much lower than the present.

R. K. F.

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TELEGRAPHS AND TELEPHONES IN EGYPT.

BY F. C. BURSTALL

(*Deputy Inspector-General, Egyptian State Telegraphs and Telephones*).

SIDE by side on the plateau at Giza stand the giant Pyramids of Cheops and Kefron, whilst nearby lies the great Sphinx, each a massive and silent wonder, transmitting its messages of a by-gone age. Side by side at the base of the plateau stand their modern counterparts—wonders, neither massive nor silent, yet day and night transmitting their messages of a present age. I refer to the "Pyramids" Telegraph and Telephone Office. Thus, in the heart of the desert do the emblems of antiquity cast their shadows on the most useful inventions of a modern age.

In this short article I intend to review only the Public Telegraph and Telephone Services; it may therefore be briefly stated that the Telegraph and Telephone Administration erects and maintains for the Egyptian State Railways all its electrical communications, including wires for "Staff," "Tyre," "Signal Repeater" and "Traffic Controls," and trains the traffic personnel, such as station masters and their assistants, in telegraph duties.

In Egypt the entire telegraph and telephone services are now State-owned. Formerly the local telephone systems were the property of the Telephone Co. of Egypt, but these were purchased by the Government in 1918. Prior to this date the trunk lines, which were erected by the State, were leased to the company for operating purposes, the company paying a 70% royalty on all income thus derived.

The telegraph and telephone geographical area of Egypt may be regarded as a kite with a long tail, the kite being the triangular northern portion known as the Delta, having the Mediterranean coast from Alexandria to Port Said as its base-line and Cairo as its apex. South of Cairo is the tail, the narrow but intensely cultivated strip of the valley of the Nile, generally from 2 to 10 miles wide, which extends some 800 miles to the borders of the Sudan. Apart from the above, there are the Province of the Red Sea, the Peninsular of Sinai, and the Oases in the heart of the Western Lybian Desert; the distance from the nearest rail-head to the Oases varying from 200 to 400 miles.

If one embarked on a sailing barge, otherwise known as a felucca, at Rosetta, near Alexandria, and followed the familiar telegraph and telephone pole routes up the Nile to their entry into the Sudan, the distance traversed would be nearly 1,000 miles.

The reader of this article may now have gained some idea of the size and formation of the country under consideration, the area of which approaches 350,000 square miles, including the vast expanses of desert. Further, if the desert areas are excluded from the calculation, Egypt is one of the most densely populated countries in the world.

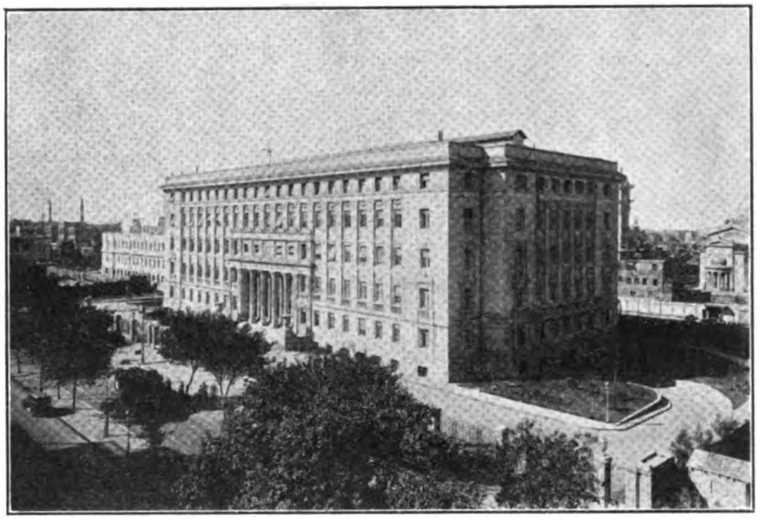
The headquarters of the Telegraph and Telephone Administration is in Cairo. The building illustrated houses the entire headquarters staff, also the Central Telegraph Office, the Auto-manual and Long-distance Exchanges. A duplicate building on an adjacent site is now in course of erection and will, *inter alia*, accommodate three 10,000 automatic telephone exchanges, the first 16,500 equipments of which will be opened at the end of 1930. In this latter building two rooms, each having an area of 1,337 square metres and a height of 4.7 metres, have been provided to meet the ultimate requirements; the basement will accommodate the Apparatus Room, power plant and batteries, the ground floor, the auto-switching equipment.

TELEPHONES.

The public telephone system consists, at present, of 100 exchanges with 39,000 telephone stations. Trunk communication is practicable between all inland exchanges—also to Palestine and Transjordania; negotiations are proceeding to extend to Syria and the Sudan. A still wider scheme is projected whereby Egypt may shortly be in wireless telephonic communication with Europe and, thereby, with the world in general.

In addition to the foregoing there is also a separate telephone system provided for the Ministry of the Interior and Public Works Department which consists of 90 exchanges and 4,500 telephone stations, used largely for police and irrigation purposes. These exchanges, which are dotted about all over the country-side at villages not generally served by the main system, are interconnected with each other and have also access to the public service at certain points.

The telephone development of Egypt is capable of vast expansion, having been retarded to a great extent in the past by an insufficiency of plant, a feature which the programme now in hand will entirely overcome. An unfortunate result of this



TELEGRAPH AND TELEPHONE HEADQUARTERS BUILDING, CAIRO.

shortage, coupled with the existence of a "flat rate" system of rentals, is the abnormal usage of existing lines with a consequent high level of ineffective traffic. The average calling rates per line are 20 per day and 2.75 in the busy hour at Cairo and Alexandria, and similar figures are recorded for the larger provincial centres. In one of the Cairo exchanges the busy-hour calling rate exceeds 4.0 per line.

Another feature which tends to force up the average calling rate is the absence of coin-box call offices; such installations are impracticable at present owing to the similarity in size of coins of different values. Call offices are therefore all of the "attended" type, which restricts, on economic grounds, their general installation. Thus cafes, shops, &c., having ordinary flat rate telephones become virtually free public call offices and such telephones are an asset to the proprietors in luring customers who, having had a free call, may be sufficiently conscience-stricken to buy something for "the good of the house."

It is hoped to remedy shortly the grave defects which accompany high calling rates by the introduction of a message rate tariff and the standardisation of currency to permit of the introduction of coin collecting boxes.

An interesting service point is that subscribers are provided with telephone directories in either Arabic or European characters

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and have the option of offering their calls in any of the four following languages: Arabic, English, French and Italian. It will be realised, therefore, that all the telephone operators have to be fair linguists, as the following photographic extract from the standard expression card will show :—

ايطالي	فرنساوي	انجليزي	عربي
Il vostro No. prego?	Votre No. S.V.P.?	Your No. Please?	اعادة النمرة المطلوبة على تمرتك كام من فضلك / المشترك الطالب
Sarete chiamato fra poco.	On vous appelera plus tard.	You will be rung later.	اذا صادق المشترك على البيانات التى اعادتها عليه العاملة ولكنه لم يضع سماعته على الحامل / يعدين نتدهلك
Lo communichero' con la Sorvegliante.	Je vous communiquerai avec la Surveillante.	I will connect you with the Supervisor.	عند ما يستمر المشترك عن امر وايس فى استطاعة عمل التسجيل ان تجيب عليه / كلم الريسه
M'informero' e vi faro' sapere	Je m'informerai et vous ferai savoir.	I will enquire and let you know.	اذا ، يتيسر تحويل المشترك الى موضع الاستعلامات يجب على العاملة ان تاخذ منه البيانات المطلوبه / راح ابحث ويعدين اقول لك
Il No. è..... vogliate prenderne nota.	Le numéro est ..... Voulez-vous prendre note.	The numl er is ..... will you please make a note of it.	عند ما يستعلم انشترك عن نمرة مشترك فى بلد آخر / النمرة.... خذ مذكرة عنها من فضلك
Mi dispiace non posso informarvi.	Je regrette je ne puis vous renseigner.	I am sorry I cannot trace it.	اذا ، يمكن الاستدلال على النمرة / انا متاسفه مش لاقيه النمرة
Desiderate notare per conto vostro una communicazione per la Sorveliante di... (Centrale) ?	Voulez-vous que j'enregistre une communication pour la Surveillante de... (Central) à votre compte?	Shall I book you a call to the Supervisor... (Central) on your account?	اذا اخ انشترك فى الطلب / اعمل لك طلب تكلم ريسة سنترال ... على حسابك
"Bustan" (Nome del Centrale)	"Bustan" (nom du Central)	"Bustan" (Name of Exchange)	اجابة النداءات على خطوط التلفون / « بستان » (اسم السنترال)

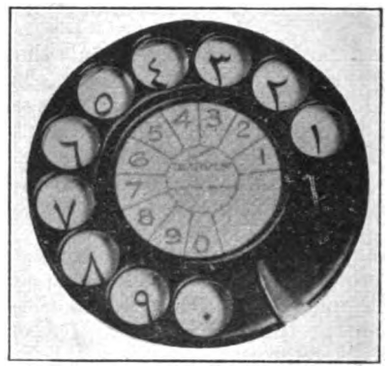
TYPICAL PAGE OF STANDARD OPERATING EXPRESSIONS IN FOUR LANGUAGES.

Before leaving the subject of telephone operators it should be remarked that females are employed for day duties only, and then solely in the large cities and towns, whilst in the smaller provincial towns male operators are exclusively appointed. The average lengths of service in the female division are: supervisors 5½ years, operators 2½ years; from which it will be realised that the operating schools are kept quite busy training new recruits.

From the standpoint of modern equipment, the present telephone exchanges may be classified as a motley crew, but Nemesis is on the trail, and "standardisation" is peeping over the horizon. Thus the magneto exchanges of various types, including lamp call and auto clear, are doomed to disappear and be replaced by "automatics" C.B. and C.B.S. within the next 5 years.

The "automatic" programme provides for the conversion of the whole of Cairo to a "Rotary" 5-digit network by 1931, involving the installation of two 10,000-line units, with eight satellites, the latter varying in size from 3,000 to 100 lines. A new trunk exchange is also being provided. In Alexandria, a new telegraph and telephone building is now in course of construction which will accommodate three 10,000-line "Rotary" automatic units to serve the city area. The initial equipment is for 15,000 lines and a new trunk exchange will be installed in the same building. All the "Rotary" equipment is being supplied by Messrs. Standard Telephones & Cables, Ltd., London.

In such a complete change of system, an intensive method of education of the telephone users has been planned. Apart from house-to-house visits of Service Inspectors, "Instruction Centres" are being established, each equipped with small working models of an auto exchange and facilities for making typical calls, during the progress of which the various tones are emitted from a loud-speaker, whilst a lamp display panel in front of the caller indicates by illuminated numerals whether the correct numbers have been dialled. Incidentally, the numbers appear on all dials in both Arabic and European characters.



AN AUTOMATIC DIAL.

At each centre specially selected officers are stationed to give instruction, and at Mansura, where an "ATM" automatic exchange is to be opened shortly, an average of 250 telephone users have presented themselves for tuition.

"Automatics" are also being installed in the larger provincial towns of Port Said, Mansura and Suez, whilst the remaining centres will be served by C.B. or C.B.S. exchanges.

Of the other major projects now in hand, the laying of a continuously loaded non-repeatered trunk cable between Cairo—Tanta—Alexandria is nearing completion. This is the first underground trunk cable of any considerable length in Egypt, the distance between the terminal points being about 125 miles. The cable is being supplied by Messrs. Pirelli General, Ltd., Southampton.

The climatic conditions of Egypt are peculiarly favourable to the use of aerial trunk routes, but these are also undergoing a process of spring-cleaning in the replacement of all iron circuits by copper. The transmission of long-distance calls will be further improved and brought into line with accepted international practices by the use of repeater units at Cairo and elsewhere; the desirability of introducing carrier wave is also being carefully studied.

The circulation of trunk traffic is based on a system of zone, group and minor exchanges, whilst the provision of trunk circuits is calculated on a maximum delay, under normal conditions, of not more than half an hour in connecting the longest calls.

The trunk charges are divided into three categories: "Normal," "Busy hours" and "Night"; an "Urgent" call, which takes precedence over all other waiting calls is connected on payment of a triple fee of the period in which it is made.

The trunk rates are very reasonable and for the "Normal" period are fixed at approximately one penny per seven miles.

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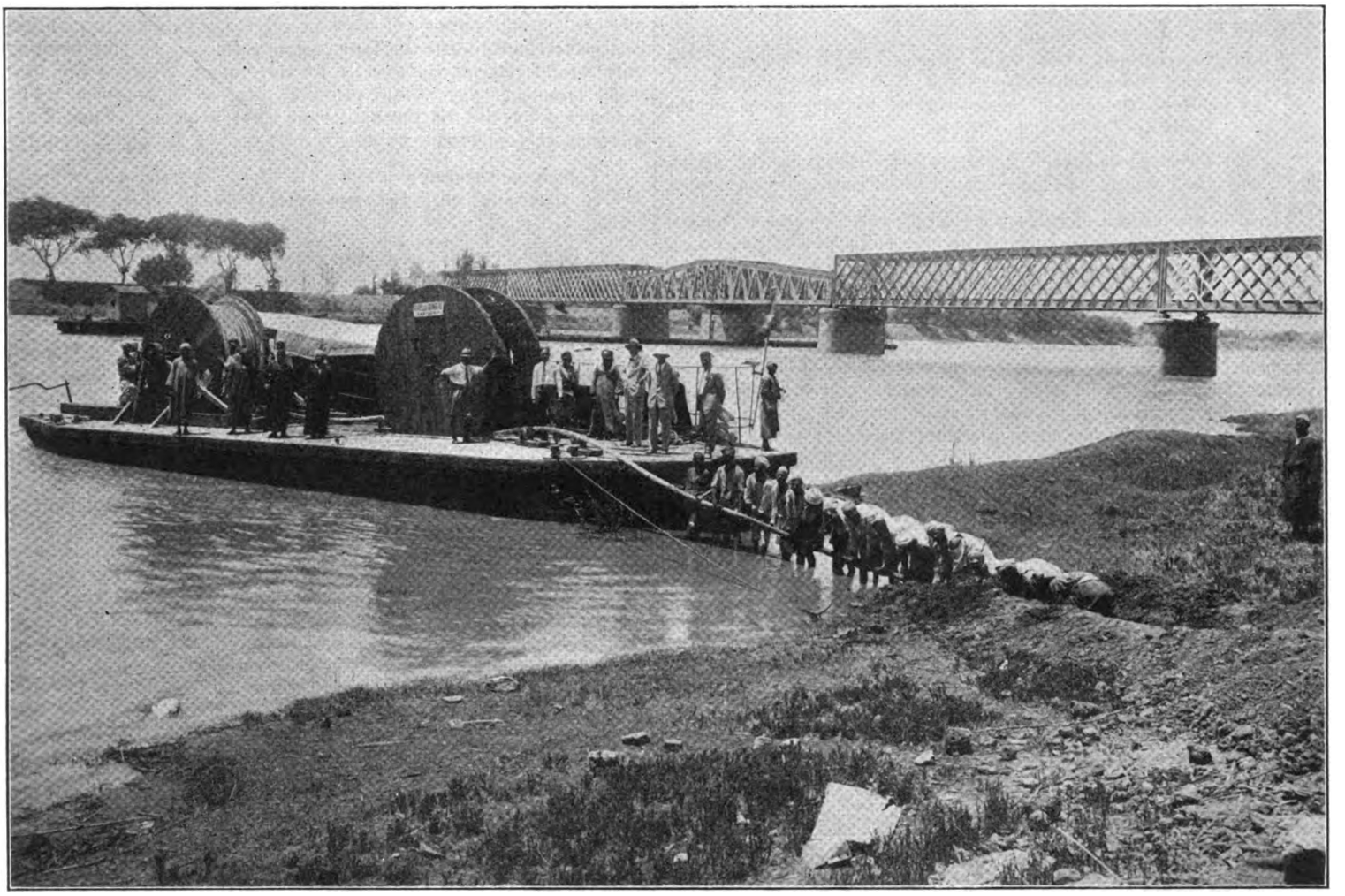

A NILE CROSSING IN THE CAIRO-ALEXANDRIA TRUNK CABLE.

The increase in trunk traffic may be gauged from the fact that the revenue from this source has risen from £31,500 in 1920 to £193,750 in 1929 without any appreciable change in tariff.

The introduction of "fixed time" and "particular person" call services is at present under consideration.

Before leaving telephones it should be stated that the problem of rural development has its well-merited place in the general scheme. Each year sees a steady addition to the list of provincial call offices—centres at which, very probably, a telephone has hitherto been almost unknown. All these constitute potential exchanges in the future, which, when the telephone habit has been fostered, may become small but busy centres, tending to augment the telephone capital account, which has risen from £780,000 in 1920 to £2,500,000 in 1930, and also to swell the revenue account, which has increased from £220,000 to £700,000 in the same period.

Finally, telephones play a not insignificant part in the ceaseless campaign which is being waged on the illicit importation of narcotic drugs. Many a smuggler who might have thought himself immune from capture in the past, has now happily, from the point of view of the country's welfare, a decreasing chance of escape as the telephone and telegraph networks spread.

TELEGRAPHS.

In Egypt, as in most other countries, the telegraph service has been, to some extent, the victim of the steady encroachment of telephones on its preserves; nevertheless, telegraphs continue to flourish and render efficient service.

Apart from the inland telegraph service, Egypt is a transmitting administration for other neighbouring countries, i.e., the Hedjaz, Yemen, Abyssinia, Erythrea and the Sudan. Formerly it was also the transmitting administration for Palestine, Transjordania and Syria, but these countries have now direct communication with Europe by means of the Eastern Telegraph Company's cable between Haifa and Cyprus, or, alternatively, by the wireless station erected at Beyrouth by "Radio France."

The inland traffic is steadily increasing, in spite of the competition of telephones, largely owing to the fact that during the main crop seasons, such as cotton, onions and cereals, business firms show preference for "Telegraphs" rather than "Telephones" in their commercial relations, as a telegram may be kept as a confirmatory material document.

The total number of messages dealt with in 1928-29 was 5,179,644—divided as follows:

Local Commercial messages	...	...	2,545,286
Foreign	„	...	362,681
Service	„	...	321,157
Railway Traffic	„	...	1,950,520

The average delay on the above-mentioned commercial traffic, over all lines, was 13 minutes 26 seconds from the time of handing in until receipt at the office of destination.

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There are 805 telegraph offices in Egypt, divided into two categories :—

(*a*) Government telegraph offices, which includes the State telegraph offices, and State railway telegraph offices, the latter being worked by employees of the Railway Traffic Department.

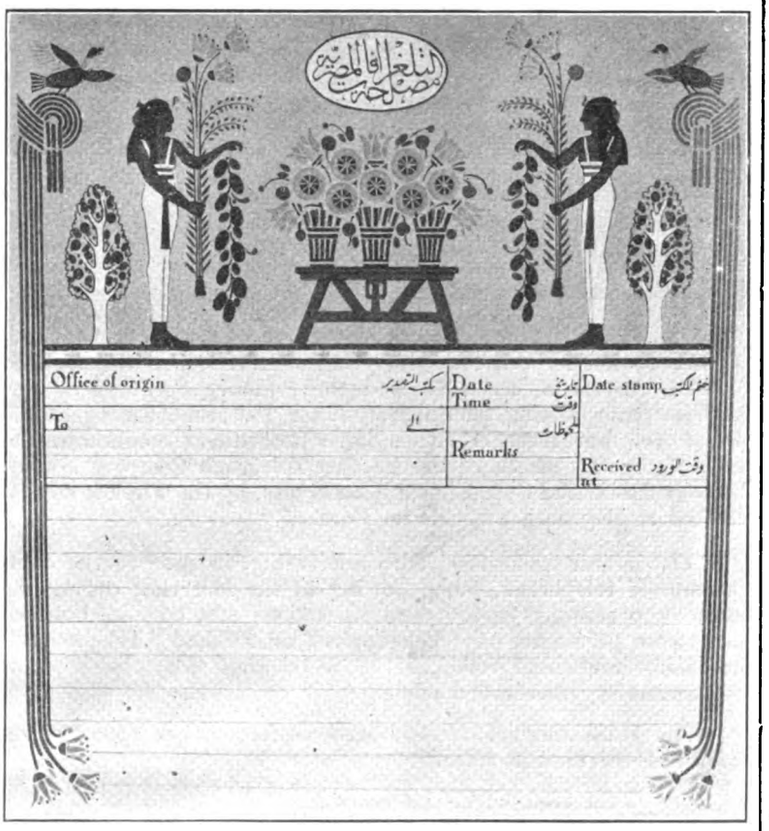
(*b*) Licensed telegraph offices, which belong to the Delta, the Fayoum, and Basse Egypt Light Railways Companies.

In a cosmopolitan country like Egypt, the Telegraph Department is at once confronted with the serious difficulties of languages. Arabic is the predominant language, and about 70% of the total telegrams are transmitted in a morse code specially adapted for Arabic characters.

From a traffic point of view the incidence of Arabic and European messages has a very restricting effect on the type of apparatus which may be successfully used. It is for this reason that simple circuits open or closed, single current simplex, single and double current duplex and quadruplex are almost exclusively employed.

High-speed instruments such as the Baudot cannot be used effectively, as this particular instrument has never been re-designed to meet the needs of Arabic characters. Wheatstone has been tried, but in practice the result has been less satisfactory than simpler types, and it has therefore been superseded.

It may be of interest to remark that for festive occasions the public may, on payment of an additional fee, send their congratulatory messages for delivery on an ornamental telegraph form. A photograph of the form is given below, but lacks the striking colour effects of the original.



A CONGRATULATORY TELEGRAPH FORM.

Foreign traffic, apart from that referred to earlier, is disposed of by three routes, namely, the Eastern Telegraph Co., The Marconi Co. of Egypt and Radio France.

Before passing to wireless, attention should be drawn to the absence of any public phonogram service. This serious omission is also attributable to the language question, as to employ Arabic only would restrict the service at the outset, whereas the use of other languages also would probably lead to so many errors that the service would be unpopular on that account. Thus for the moment this excellent public facility cannot be introduced.

Telephone-telegram service is, however, in operation for Arabic telegrams only between smaller State offices, and works satisfactorily.

WIRELESS.

The State wireless services only undertake "Ship-to-shore," "Aircraft" and "Point-to-point" internal traffic.

The Marconi Company of Egypt, having purchased the Abou Zabal Wireless Station from the British Post Office, now operate International Correspondence under licence from the Egyptian Government.

There are nine Egyptian wireless-telegraph stations, exclusive of mobile land stations, to handle the afore-mentioned services. The coast stations of Alexandria and Kosseir serve, within prescribed limits, the ships traffic in the Mediterranean and Red Seas, respectively. Some of the inland stations are situated in Oases in the heart of the Lybian Desert and form the only means of electrical communication between these points and the rest of Egypt. Some idea of the inaccessibility of a typical Oases station may be gleaned from the fact that it would take at least five days to reach it by camel, or if, haply, a motor-car convoy were practicable, the journey might be uncomfortably made, provided no undue mishap occurred, in about 15 hours.

In lighter vein, and for the instruction of those uninitiated in the joys of camel riding, it may be said that, provided one can remain in the saddle during the three very distinct and unpleasant undulations which a camel makes in rising to its four feet before starting off, an hour's trot, to those unaccustomed to it, will cultivate a pain which may be termed a twin brother to a good sharp attack of lumbago.

To conclude this section without reference to broadcasting would be a serious omission. It is the policy of the Egyptian Government to make provision for this service in the near future, in which event I hope that I shall not be deputed to act as an "Uncle" in the "Children's Hour," for in telling the tale it would be necessary to do so in half a dozen different languages, failing which there would be a distinct slump in the market value of Uncle's popularity.

In this short article I have endeavoured to make a lightning tour of this Administration's activities without delving into technicalities. I hope, however, that I have conveyed the impression that the Egyptian State Telegraphs and Telephones, with its 7,500 employees, is contributing a fair share not only to the development of the internal communications of Egypt but also to the end that, in due time, it will form an integral and efficient part of a network which will be world wide.

NORTH MIDLAND DISTRICT: DISTRICT MANAGER'S SOCIAL COMMITTEE.

AN enjoyable evening was spent at the Co-operative Restaurant at Nottingham on Feb. 4, when Mr. Chris Thompson, Telegraphs, Birmingham, gave a Lantern Lecture on "Southward to the Alps." The lecture was illustrated by beautiful slides mostly of the lecturer's own preparation, and was given in a manner in which seriousness and humour were nicely balanced. The hearty vote of thanks which followed testified to the pleasure which the audience had had in hearing Mr. Thompson. It is hoped that he will again be able to visit Nottingham and complete his lecture by taking us "Southward from the Alps."

Supper was served immediately after the lecture and subsequently Dancing and Whist were provided until the end of a very happy evening.

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THE TELEPRINTER.

A. P. OGILVIE (*Headquarters Traffic Section*).

(*Continued from page* 83.)

(IV.)

Receiver.—Mounted on the base immediately in front of the motor, a polarised relay of distinctive construction is fitted for the reception of incoming signals. This relay may be inserted in the line circuit on short distance routes, but normally it is included in the local circuit of a Post Office Standard Relay "B" or "G." The elongated armature moves between marking and spacing stops and carries, at right angles, an extension to a mechanical relay. The purpose of the mechanical relay is to provide more power than may be obtained from the Teleprinter polarised relay when the latter is operated by weak variable line currents. As, however, the arrangement of working the Teleprinter in the local circuit of a separate line relay ensures that steady currents of ample strength are available it is a question whether the mechanical relay device

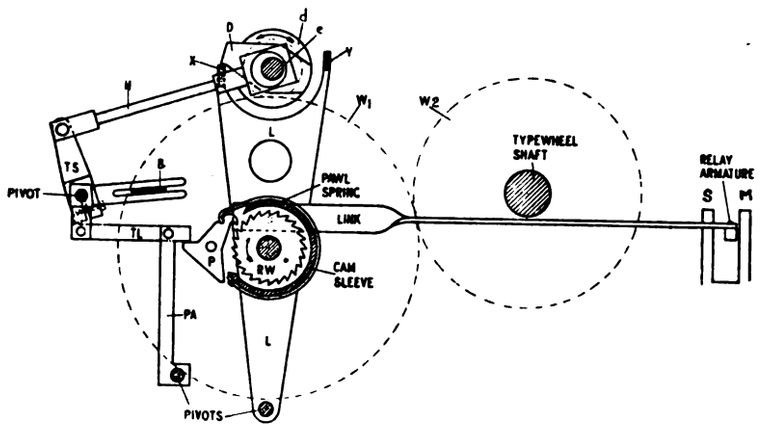

FIG. 9.

may not be dispensed with on Post Office machines, and trials are in progress to determine this point. A study of Fig. 9 will show how the movements of the polarised relay armature are transmitted by the mechanical relay to rod (H), thence to the trip shaft (TS). The motor drive is connected through a friction clutch to the cam sleeve and is coupled or uncoupled by the action of the pawl abutment (PA). Immediately the "start" impulse is received the relay armature moves to the spacing stop and this movement, conveyed to rod (H), causes the trip shaft (TS) to withdraw the trip lever (TL) and pawl abutment (PA). The friction clutch then becomes operative and the motor drive is coupled to the receiver cam sleeve. This cam sleeve (C) has five tracks, only two of which at the moment need be considered. Track 3 controls the traversing bar (T) which carries a striker pin (S). At rest, the striker pin is positioned opposite the centre one of five selecting fingers (F), but when the cam revolves, track 3 moves the traversing bar to the left until the striker pin is opposite the first selecting finger, then to the right until the fifth selecting finger is reached, finally returning to the zero or midway position. Track 5 on the cam sleeve controls the striker blade (B). Five steps in this track cause the blade to move forward each time the striker pin is opposite successive selecting fingers. The striker blade is also controlled by rod (J) and responds by tilting upwards or downwards to the movements of the trip shaft also in turn controlled from the relay.

Bearing in mind these principal operations it is not difficult to follow the ingenious translation system. Assume that the letter S (+ — + —) has been signalled. The "start" impulse moves the relay armature to "spacing," the movement being conveyed to the trip shaft which releases the clutch mechanism bringing the cam into action, at the same time tilting the striker blade downwards clear of the striker pin. The cam then revolves and the

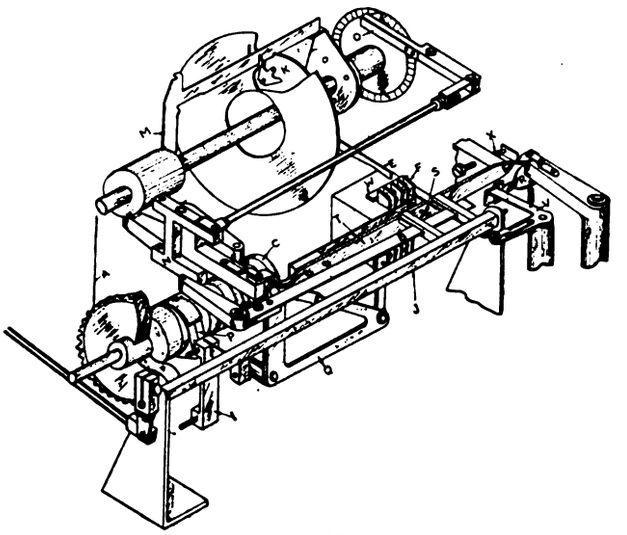

FIG. 10.

traversing bar brings the striker pin opposite to the first selecting finger in time for the first impulse of the signal combination. This, for the letter S, is positive, consequently the relay armature returns to the "marking" stop and the striker blade is tilted upwards into the path of the pin (S). At this point the appropriate step in track 5 throws the striker blade forward and the pin moves the first selector finger in. The next impulse (negative) moves the relay armature to the "spacing" stop, tilting the trip bar and the striker blade out of the path of the striker pin so that in the next forward stroke the blade misses the pin and the second selecting finger remains unaffected. The third impulse (positive) again brings the striker blade

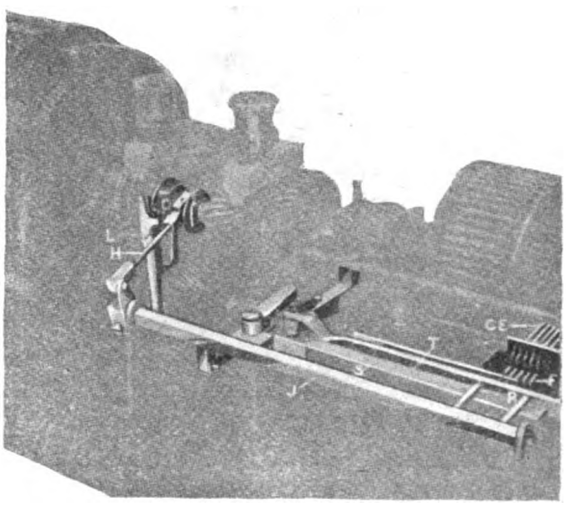

FIG. 11.

into the plane of the pin and at the next stroke the third selecting finger is pushed in. The remaining impulses keep the blade clear and the traversing bar completes its travel without affecting the last two selecting fingers. On completion of a revolution the cam sleeve is brought to rest by the interposition of the pawl abutment controlled from the trip shaft, and the motor drive is uncoupled. As a result of these operations the signal combination + — + — is translated into a corresponding permutation of the selecting fingers preparatory to the printing of the letter S.

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Printer.—Five combination discs or combs (K) mounted side by side on a drum are capable of being turned a fraction of an inch to occupy one of two positions. Associated with these discs are five extension pieces (E) controlled by the selecting fingers (F). Each comb is slotted on its edge and for each permutation set up

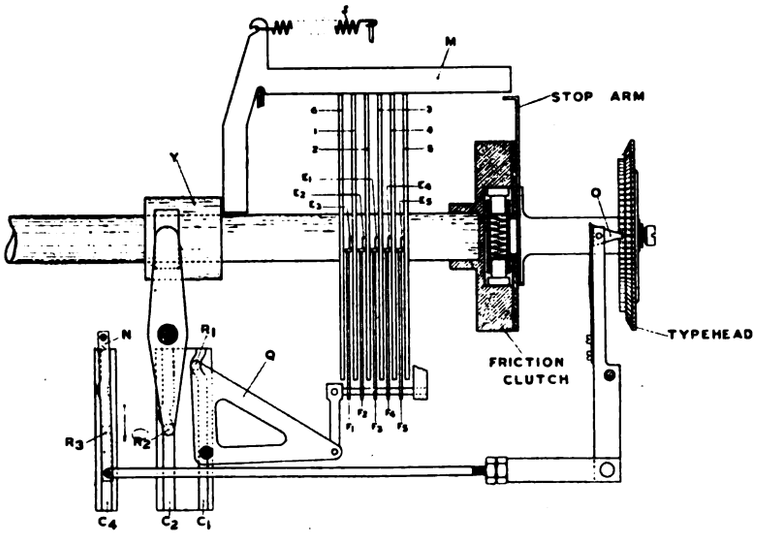

FIG. 12.

two longitudinal slots are exposed at one point on the periphery of the combs, permitting the entrance of a latch (M), the outer end of which drops into the path of the typehead stop arm.

The typehead and stop arm are continuously rotated through a friction clutch, but the interposition of the latch arrests this movement. A hammer (O) controlled from track (4) is at that moment actuated and strikes the back of the type exactly opposite thus printing an impression of the letter on the tape. An improved typehead is now being fitted consisting of a wheel of short type bars to give a better pointing stroke than that obtained from the form of typewheel illustrated.

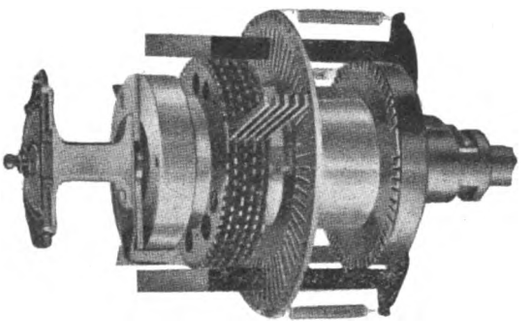

FIG. 13.

Letter and Figure Shift.—A sixth or shift comb is provided to determine, when a combination is set up on the other five combs, whether the appropriate letter or figure equivalent shall be printed. This comb is actuated by two bellcranks corresponding to the shifts which move it into one of two possible positions so as to close one set of slots and open the other, thus when a " letter-space " signal precedes the signalling of the combination — + — + — (R or 4) the shift comb closes the figure slots and opens the letter slots, allowing the letter R to be printed.

Other mechanical details which need not be described are provided for resetting the selecting fingers and for restoring the printer latches. It should perhaps be mentioned that the selection of a letter is made in one revolution of the cam and printed during the next, concurrently with the selection of the following letter. This overlap leads to the printing being one letter behind, a feature which has not caused any practical difficulty.

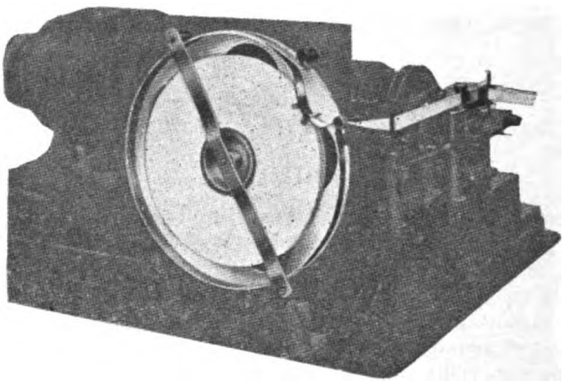

FIG. 14.

The tape feed arrangements and the printing platen are shown in Fig 14. The inking of the type is effected by means of two felt ink rollers held by springs against the face of the type as the type-wheel revolves. Some inconvenience is occasionally experienced as a result of the tape slipping between the guide strap of the holder and the coil. A more effective tape holder has now been designed and will in time gradually replace the existing fitting.

(To be continued.)

CORRESPONDENCE.

THE " LAG "—ITS CAUSE AND CURE.

TO THE EDITOR OF " THE TELEGRAPH AND TELEPHONE JOURNAL."

SIR,—In looking through the *Telegraph and Telephone Journal* one comes across many articles dealing with the fact that the advantages of the telephone are as yet unappreciated by many people in this country, and many and various reasons are given for this state of affairs.

I suggest that a good deal of information on the question might have been got and possibly a few orders obtained if the Department's own staff above certain grades were canvassed. Some few weeks since I was talking to one of our higher officials on the question of development, &c., and in the course of the discussion I elicited the fact that he was not on the telephone at his private residence.

It occurs to me that if many of the Department's officials are not on the telephone it might be interesting and possibly helpful to Contract Staffs if they ascertained the reason by systematic enquiry.

I assume, of course, that " W. G.," the writer of the article in the January issue, is himself a subscriber and likewise all his immediate colleagues.—Yours faithfully,

J. M. SHACKLETON.

HOW TO IMPROVE THE TELEGRAPH SERVICE.

TO THE EDITOR OF " THE TELEGRAPH AND TELEPHONE JOURNAL."

DEAR SIR,—Your correspondents " W. H. L. and J. S." (Carlisle), in their letter on the Inland Telegraphs in your November issue appear to have hit several nails on the head in the course of their remarkably well-thought-out suggestions. I must say, however, that their scheme for graduating charges on inland telegrams according to the actual mileage distance of the destination *from the office of origin* (which, it is inferred, is what they suggest) strikes me as being a weak point. Endless difficulties would certainly arise in assessing distances, especially at small offices, and to have a complete list of telegraph offices with distances and charges, specially compiled for each separate office, would be a tremendous proposition.

I have given the question of a zone system of charging for inland telegrams some thought, and have come to the conclusion that a system of charging on a " County Distance " basis is the simplest and most practicable. It can be done as follows :—

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Divide Great Britain and Northern Ireland into 58 counties or areas.

Fix—

(1) the lowest rate per telegram of 12 words (say 9*d.*) for telegrams to any destination in a county which is situated not more than (say) 50 miles *from any part of the county* (*or area*) in which the office of origin is situated.

(2) a higher rate for telegrams to destinations in counties between 50 and 100 miles distant *from any part of the local area.*

(3) a still higher rate for distances of from 100 to 200 miles, and

(4) the highest rate for places beyond 200 miles.

Senders of telegrams between Scottish, North of England or Northern Irish towns and the South of England would undoubtedly be called upon to bear the heaviest burden, but this would be only just, as at present the services they make use of are indirectly very heavily subsidised; these users would, moreover, still get far more value for money than the senders of short-distance telegrams. Doubtless the opposition of our Scottish and Northern Irish friends would be modified by the fact that Scotland and Northern Ireland would each be scheduled as unified areas, and the charge for any telegram originating and terminating in Scotland, and likewise in Northern Ireland, would be at the lowest rate.

The scheme would permit of all offices in the same county (or other area) using a standard zone list of counties and rates.

As an example, the standard zone list for use at all telegraph offices in the London Postal area might be as follows:—

County (*or Area*).	*Charge per word.*	*County* (*or Area*).	*Charge per word.*
Anglesey	2*d.*	Lancashire	1½*d.*
Bedfordshire	½*d.*	Leicestershire	1*d.*
Berkshire	½*d.*	Lincolnshire	1½*d.*
Brecon	1½*d.*	London (Postal area) ...	½*d.*
Buckinghamshire	½*d.*	Merioneth	1½*d.*
Cambridgeshire	½*d.*	Middlesex	½*d.*
Cardiganshire	1½*d.*	Monmouthshire	1½*d.*
Carmarthenshire	1½*d.*	Montgomeryshire	1½*d.*
Carnarvonshire	1½*d.*	Norfolk	1*d.*
CHANNEL ISLANDS ...	2*d.*	Northamptonshire ...	1*d.*
Cheshire	1½*d.*	NORTHERN IRELAND ...	2*d.*
Cornwall	2*d.*	Northumberland	2*d.*
Cumberland	2*d.*	Nottinghamshire	1½*d.*
Denbighshire	1½*d.*	Oxfordshire	½*d.*
Derbyshire	1½*d.*	Pembrokeshire	1½*d.*
Devonshire	1½*d.*	Radnor	1½*d.*
Dorset	1*d.*	Rutlandshire	1*d.*
County Durham	2*d.*	SCOTLAND (all parts) ...	2*d.*
Essex	½*d.*	Shropshire	1½*d.*
Flint	1½*d.*	Somersetshire	1½*d.*
Glamorganshire	1½*d.*	Staffordshire	1½*d.*
Gloucestershire	1*d.*	Suffolk	1*d.*
Hampshire	½*d.*	Surrey	½*d.*
Herefordshire	1½*d.*	Sussex	½*d.*
Hertfordshire	½*d.*	Warwickshire	1*d.*
Huntingdonshire	1*d.*	Westmorland	2*d.*
Isle of Man	2*d.*	Wiltshire	1*d.*
Isle of Wight	1*d.*	Worcestershire	1*d.*
Kent	½*d.*	Yorkshire	1½*d.*

The vast majority of counter officers would soon get to know the county of destination to which the great bulk of telegrams handed in locally are directed, and any information required for assessing the charge would generally be provided by a glance at the zone list. In the case of telegrams to little-known destinations reference to the Post Office Guide would, of course, sometimes be necessary in order to ascertain the county of destination, but this is already done under the present system in these cases for the purpose of ascertaining whether there is a telegraph office of the name given, or whether the spelling, &c., is in conformity with official requirements.

Accountant-General's Department, Dec. 17. F. J. BINDER.

DISTANT CONTROL OF WIRELESS BROADCAST RECEIVERS.

TO THE EDITOR OF "THE TELEGRAPH AND TELEPHONE JOURNAL."

DEAR SIR,—Many thanks for your article contributed by Mr. B. S. Wallace on the "Distant Control of Broadcast Receivers."

The use of the electric bell system, leaving the front door push intact, is ingenious. Evidently Mr. Wallace resides quite near a station, as he is able to work several speakers with one L.T. stage and no reaction.

Would he be good enough to tell us how he obtains his output of real quality. Does he consider the pentode superior to the super-power valve, or the moving-coil speaker a better job for real results than the balanced armature type.—Yours faithfully,

Preston, nr. Weymouth. Feb. 17. J. W. WILLSHIRE.

ORDERING GOODS BY TELEGRAPH AND TELEPHONE.

MR. W. ERIC JACKSON, L.L.B., Barrister-at-Law, recently made some very interesting remarks, and gave some very useful information in an article which appeared in the *Electrical Review*. "Writing," he says, "is not legally necessary to a valid and enforceable contract of sale," and thus a contract made over the telephone for the sale of goods is enforceable, but if writing is not used there must be evidence of some kind, and the law lays down what that is to be. "If the goods are of less value than £10 in value no formality is necessary." If the goods are over that value there are four types of evidence permissible. For example, if goods are ordered by telephone and *delivery* can be proved, the case is proved. If the buyer after telephoning sends a messenger to fetch the goods, it is up to the vendor to prove that the goods were actually delivered to the purchaser; but should these transactions take place in Scotland, the English Sale of Goods Act does not apply, for: "In Scotland any evidence, verbal or otherwise, is enough to prove a contract of sale." In the case of an order telephoned from, say, Glasgow, ordering goods from, say, London, it is Scottish law which would apply, since the order is executed in Scotland, and since verbal orders are good law in Scotland for goods up to any value, the proof of the telephone order will be enough. There is, of course, the difficulty that when an order is received over the telephone "one cannot tell where it comes from in actual fact."

Our barrister friend expresses the opinion that, "A telegram is a much more satisfactory mode of ordering goods quickly from a long distance as the original copy of the telegram retained by the Post Office will be evidence against the buyer." It is admitted, however, that even then, were the telegram written by some unauthorised person not actually an employee of the buyer, the original copy would be of little use in a court of law.

That Mr. Jackson's article was not based on mere supposition or imagination is clear, from the fact that the Yorkshire police recently issued a warning to traders to take special care in receiving and executing orders received by telephone since "the number of frauds perpetrated by such means is reaching an abnormal scale."

The moral is not that Yorkshire is a wickeder county than any other, but that "a word to the wise is sufficient."

J. J. T.

RETIREMENT OF MISS E. M. COOK.

ON Feb. 6 a large company assembled in the Typewriting Department of the Registry at the G.P.O. North, London, to say farewell to Miss Edith Marianne Cook, the Chief Superintendent of Typists, on her retirement after nearly 37 years' service, first with the National Telephone Company, and since 1911 with the Post Office. Miss Cook was one of the original members of a staff of nine girls engaged in the newly formed Typewriting Department of the Company in 1896, and in 1901 became the Clerk in charge of that Department. On her transfer to the Post Office in 1911 the typewriting staff had grown to some 25, and she also was placed in charge of the typists in the P.O. Registry, numbering in all, with the ex-National typists, about 110.

The affection and esteem in which Miss Cook was held by her staff and by her colleagues was evidenced by the large gathering which mustered, representing all Departments of the Post Office, and by the numerous presents she received. These included a china cabinet, onyx and chromium clock, tea service, gold watch-bracelet, and electric tea kettle.

Mr. R. A. Teare, the Registrar, in a happy speech, made the presentation on behalf of his large "family," of which, he said, he regarded Miss Cook as a sort of elder sister. His references to her popularity and the good spirit of team work which she had inculcated were heartily cheered. Mr. W. H. Gunston, on behalf of her old colleagues in the National Company, said a few words expressive of their appreciation of her work and character, after which Miss Cook, in a short but heartfelt speech, returned thanks to her friends and colleagues.

Miss Cook's position as Chief Supt. has been filled by Miss Ida Beaumont.

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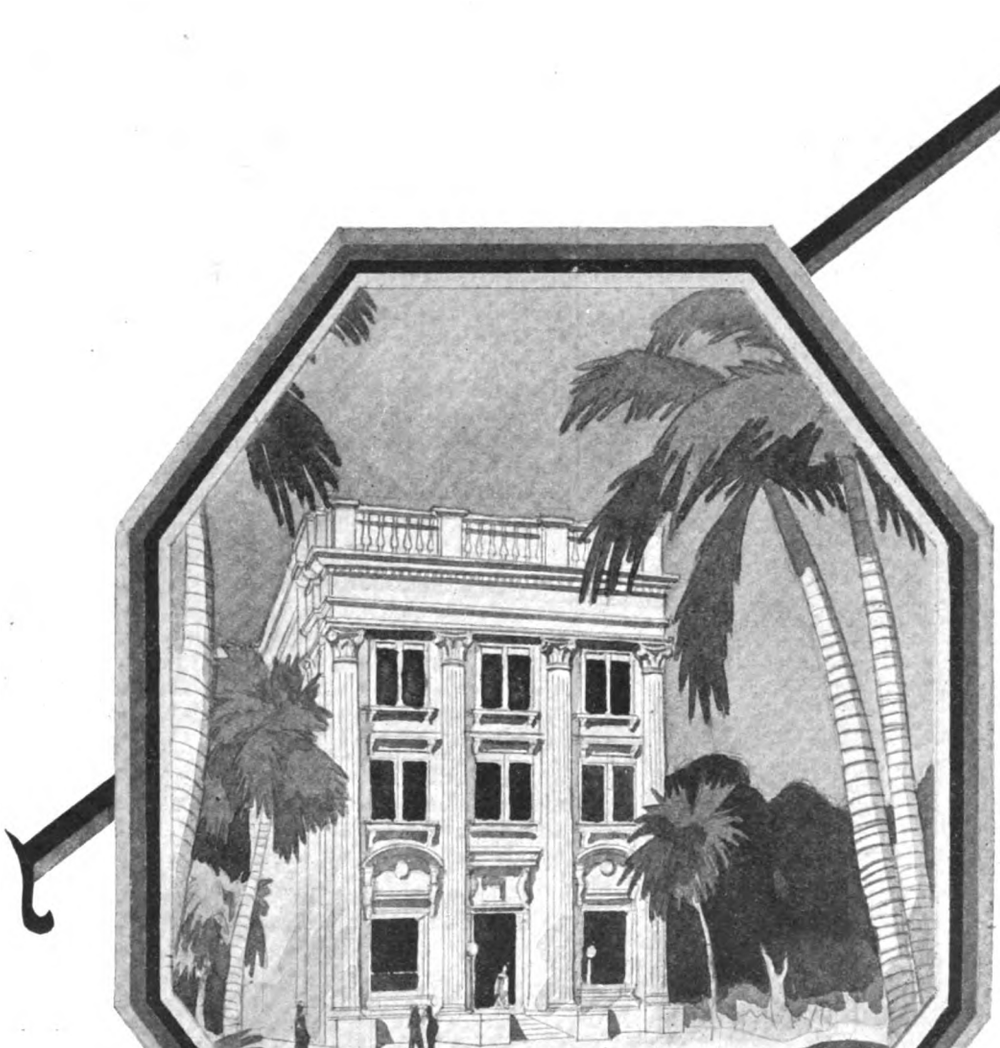

The beautiful telephone building of the Mutual Telephone Company of Honolulu, Hawaii. This company owns and operates more than 20,000 telephones throughout the island group, of which approximately 65% are automatic.

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STROWGER AUTO
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GENERAL EXPORT DISTR
The Automatic Electric Company

In Canada . . . Independent Sales an
Vancouver
In Australasia . . . Automatic T
In Japan . . . Automatic Telephe

STROWGER

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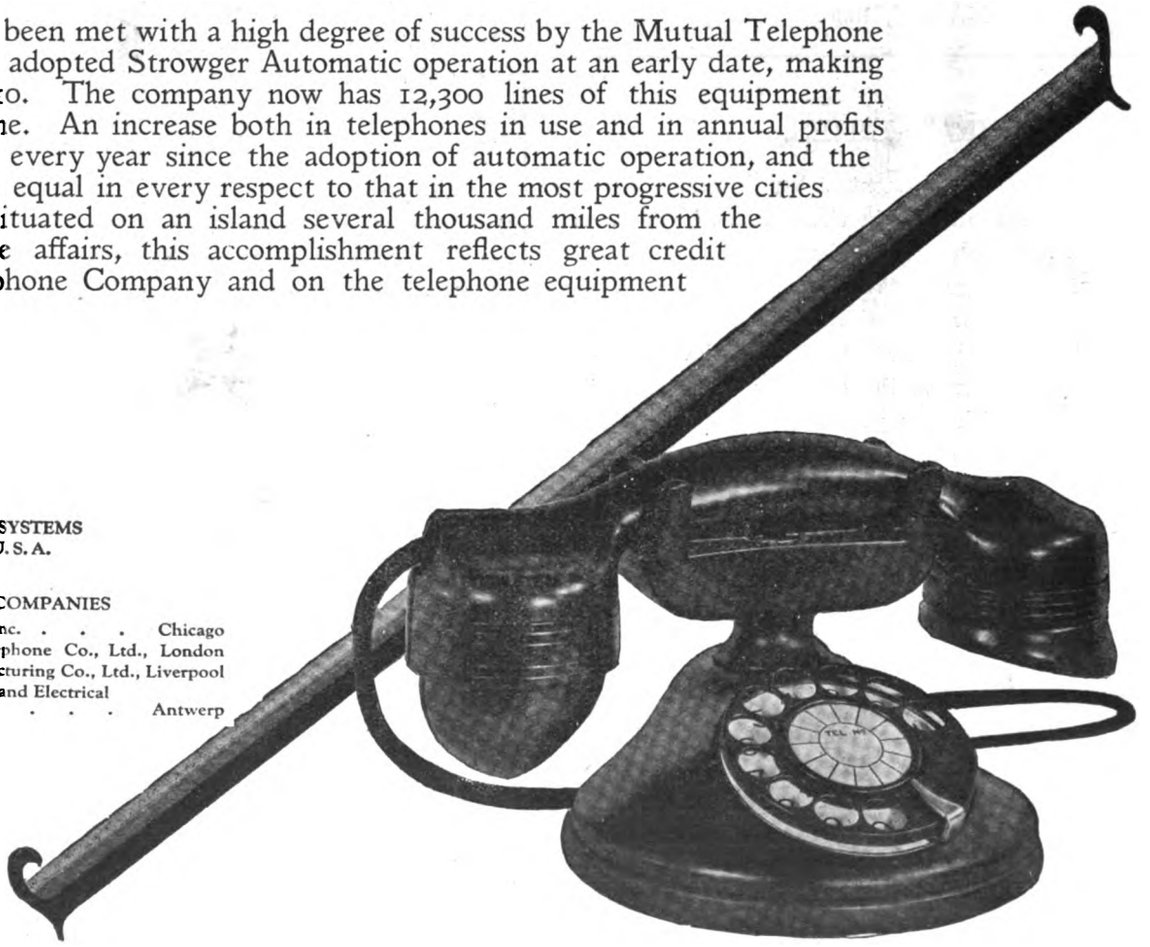
vger Automatic Meets re Conditions in Honolulu

E island of Hawaii has presented a considerable number of difficulties to the proper development and operation of telephone service. The relative humidity is high, making rust prevention an important problem. The prevalent saltiness in the air aggravates fficulties of insulation in all electrical circuits. The white ant and other tropical insects are a constant menace to poles, bell boxes and other wooden parts. Added ese obstacles, is the fact that over thirty per cent. of the telephone subscribers to the Oriental races, making the language problem of prime consideration if service is to be provided.

these problems have been met with a high degree of success by the Mutual Telephone any of Honolulu. It adopted Strowger Automatic operation at an early date, making st installation in 1910. The company now has 12,300 lines of this equipment in ion in Honolulu alone. An increase both in telephones in use and in annual profits een made practically every year since the adoption of automatic operation, and the e is considered to be equal in every respect to that in the most progressive cities United States. Situated on an island several thousand miles from the of world telephone affairs, this accomplishment reflects great credit on the Mutual Telephone Company and on the telephone equipment it uses.



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The
Telegraph and Telephone Journal.

PUBLISHED MONTHLY IN THE INTERESTS OF THE TELEGRAPH AND TELEPHONE SERVICE, UNDER THE PATRONAGE OF THE POSTMASTER-GENERAL.

Editing and Organising Committee - - - Lieut.-Col. A. A. JAYNE. J. STUART JONES. W. D. SHARP. W. H. U. NAPIER. J. W. WISSENDEN.

Managing Editor - - W. H. GUNSTON.

NOTICES.

As the object of the JOURNAL *is the interchange of information on all subjects affecting the Telegraph and Telephone Service, the Managing Editor will be glad to consider contributions, and all communications together with photographs, diagrams, or other illustrations, should be addressed to him at the G.P.O. North, London, E.C.*1. *The Managing Editor will not be responsible for any manuscripts which he finds himself unable to use, but he will take the utmost care to return such manuscripts as promptly as possible. Photographs illustrating accepted articles will be returned if desired.*

VOL. XVI. MARCH, 1930. No. 180.

RURAL LINES.

IT is not our purpose to comment at length on the debate on Mr. Ramsbotham's recent motion in the House of Commons to transfer the postal, telegraph and telephone services to an *ad hoc* public corporation. The arguments of the movers were faithfully dealt with by the Postmaster-General, and the motion was lost by 187 votes to 51. We shall only refer to Mr. Ramsbotham's statement —"As for our rural telephones, the condition of affairs cries to Heaven for redress," (which was probably uttered in ignorance of the fact that 133 rural exchanges and over 4,000 rural call offices were opened in 1929) in order to remark that rural development is proceeding at a greater rate than any other form of telephone development, and to suggest also that it may profitably be considered in conjunction with an article in the American *Telephone Engineer* of December last.

Most critics in talking vaguely of the sufficiency or deficiency of rural telephones in various parts of the world are apt to lose sight of the question of efficiency. Rural lines are provided in certain countries by all sorts of authorities and individuals. They are of all sorts of grades of construction and of all varieties of transmission value. Thus we learn from the *Telephone Engineer* that the Secretary of the Minnesota Association is their authority for the statement that 43 per cent. of the rural telephones of that state are operated by mutual lines.

> "We have heard it said," continues that journal, "that 80 per cent. of the rural telephones of Iowa are on grounded lines. A drive across that state will prove that there are not many places where the rural lines are of high grade construction. We are familiar enough with conditions in the five states bordering Lakes Erie and Michigan to know that the rural telephone plants in many places could stand substantial improvement.
>
> Perhaps there has been too much said about this condition, but it is likewise true that there has been too little done about it. Conditions can not be remedied in one year or two, but will require years of effort. Millions of dollars will have to be expended to put the rural lines of the country in first-class shape.
>
> It is certain that these millions will not be expended until the farmers of the country are willing to pay rates that will justify the expenditure and this cannot be expected during the present depressed condition of agriculture."

We hasten to make it clear that these criticisms do not apply to the system of the American Telephone and Telegraph Company and its associated companies (known generally as the Bell system), nor, presumably to the larger independent companies in the U.S.A., but to the lines erected by communal or co-operative effort or by small rural companies. They are instructive as showing that cheap rural service can be obtained at a price. But telephone engineers (especially in those countries which aim at providing such a standard of transmission as will enable trunk service to be afforded not only to the nearest small town, but also to the big centres of industry and to countries overseas) will rub their eyes when they read of those percentages of lines worked on earth returns.

We do not know if our rural telephone-users cry to Heaven, but they are at least able to call to London, Glasgow and Manchester, not to mention the Continent and the United States, while we doubt whether some subscribers in Iowa on grounded lines would be able to make themselves heard very far beyond the nearer home-towns.

One moral to be drawn from this story is the danger of talking of "the rates in America" and "service in America" with the large vagueness frequently indulged in by our critics. Rural Iowa is America as well as New York or Chicago, and though we should not dream of pointing to the telephone service in the former to which the *Telephone Engineer* alludes as typical of justly vaunted American excellence, we are quite accustomed to having Iowan rural rates quoted against us as a warning and a sign!

A WORLD TELEPHONE SYSTEM.

THE January number of *Europäischer Fernsprechdienst* contains an able article on "The World Telephone System in its Geographical Implications" by one of the editors, Dr. Craemer, a former high official of the German Post Office. Dr. Craemer envisages the early spread of inter-continental telephony between Europe, Asia, and Africa on the one side and North and South America on the other side of the Atlantic, between Europe, South Africa, Western Asia, and Australia, between Japan and California, at first by radiotelephony and later—in cases where it is possible—by

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submarine and overland trunk cables. He foresees telephone service by wire extended overland to Russia, Siberia, China, and even Japan, and across the Mediterranean by cable to Egypt and Northern Africa in such a manner that at least the western parts of Asia and the northern parts of Africa will form traffic feeders to the eastern terminals of the transatlantic service. No part of the globe promising traffic escapes his prophetic vision, or is omitted from the wide scope of his suggestions. The article will well repay careful study, and we shall welcome the development of the extensions he foreshadows—the earlier the better !

One of his statements on a point of detail which taken by itself might give rise to erroneous impressions seems to us to call for comment.

It is to the effect that long wave circuits will hardly come into consideration for future services, to which he adds that in the newly-opened radio channels between Europe and North America short-wave working has been adopted. It is true that the long-wave radio channel between England and America has been supplemented by 3 short-wave circuits, but it should be made clear that the long-wave circuit, by reason of its greater stability and the longer daily period during which it is effective, functions in considerable measure as the backbone of the service. The provision of a second long-wave circuit is in fact under consideration. Short waves have good transmission efficiency during part of the day only, different wave-lengths having their best transmission at different times of the day, so that with a choice of three wave-lengths it is possible to ensure that, under average conditions, at least one short-wave circuit will be good at any time. Short-wave circuits supplement rather than replace long-wave circuits. In neither kind of transatlantic circuits are satisfactory results obtained during 100% of the day. A combination of a short and long wave-lengths therefore gives a greater assurance of continuous service than either type of circuit alone.

As Dr. Craemer says, a truly promising field lies before telephone and telegraph engineers in the extension of inter-continental telephone services, and we join in his hope that full co-operation between state administrations and private companies may render it fruitful.

HIC ET UBIQUE.

THE number of telephone stations in Great Britain given in the first paragraph of this column last month referred to Dec. 31, 1929 and not to Jan. 31 last.

Telephone service between this country and the Vatican State was opened on Feb. 20. On the same date the existing Anglo-Italian service was extended to include all places in Great Britain on the one side and all places in the Italian zones I and II and Florence and Rome.

The Postmaster-General of South Africa's report for 1928/29 states that the long distance telegraph and telephone route between Cradock, Middelburg, Naawport, and De Aar is nearing completion. This will provide communication between Port Elisabeth and Capetown, Johannesburg, Bloemfontein, &c. There will be a repeater station at Cradock.

The official report of the Italian Ministry of Communications for 1928/29 shows that there were 333,057 telephone stations in Italy at June 30 1929 as against 292,867 at the end of the previous June. The number of telephones in Milan has risen from 30,659 to 36,044 ; in Rome from 21,617 to 25,987 ; in Turin from 13,549 to 16,446 ; in Genoa from 11,812 to 14,056, and in Naples from 8,696 to 10,926.

According to the *New York Herald*, new rates came into force in New York on Feb. 1. In Zones I-IV and VI, VII (Manhattan, part of Bronx and Brooklyn) they represent an increase of from $4.75 per month for 75 calls to $6 (business premises) and from $4 to $4.50 for 66 calls (residences). In Zone 5 (part of the Bronx) the new rates are $5 and $4.25 respectively. In Queens (Zones VIII, IX, and X) again they are $6 and $4.50. This means for 900 calls (business rate) the annual charge will in general be about £15, and for 792 residence calls, about £11 3*s*. 0*d*. (We learn that these rates were introduced on a temporary basis not to exceed three months. The rates ordered by the New York Public Utility Commission will provide for an increase of the principal business rates from $4.75 to $5.75 per month, and of the residence rates from $4 to $4.40.)

An agreement is expected to be signed during the coming week, says the *Exchange Telegraph*, with the German concern of Siemens-Halske for the installation and operation for a period of 38 years of the telephone system in Athens.

Those of us who have read the latest American novels have become familiar with the word " mortician " in the sense of funeral undertaker. But wait !

Suppose you want to lop some branches which interfere with a telephone route. Send a crew of ordinary tree-trimmers and then send a crew of So-and-so's " dendricians," and you will see the difference ! At least, so says an advertisement in an American telephone journal. " Dendricians " is distinctly good.

The " party line " is not so rife in this country as in America, and the following incident related in an American paper may lose some of its point over here, though descriptive of a typical rural American grievance.

I wanted the " vet " like billy-o, and of course these two champion long-distance talkers had a monopoly of the wire.

" I've just put the roast on for dinner," I heard one tell the other, " and it's doing so nicely."

Twenty minutes later they were still going strong. I bore it for a minute or so and then " cut in " :

" Missus," I interjected, " I can smell your meat burning."

There was quite a scream, but I got the line clear.

A certain reverend gentleman in the wilds of the West Country —apparently of Irish extraction—resented enquiries about his wireless licence, and a conciliatory letter was sent to him from Headquarters by a certain male colleague whose first initial is " A." He has received the following reply and is in some doubt whether he ought not to ask the reverend and amorous gentleman whether his intentions are strictly honourable.

MY DEAR AMELIA,—Excuse my addressing you by your christian name. Amelia sounds more like honey than Annie, and it is such a sweet letter you have written, but why so distant ? In common courtesy you should have put at least " Dear Sir " instead of " Sir." Courtesy always pays, and is the soul of success. Your letter is certainly more amorous than your previous effusion. No threats !—but still doubts. " As your letter would seem to suggest " is not worthy of you, my darling one. How very considerate of you to send an envelope and to save me postage. A distinct advance. We are getting to know each other better. I should so much like to work in the office with you. You have not yet taken advantage of my offer. My licence No. is ..... and I am licensed till Nov. 30 next. Good-bye, sweet one. Write soon. Yours faithfully.

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TELEGRAPHIC MEMORABILIA.

"EDISON warns President Hoover to keep the Government out of business!" is the headline of an American newspaper which in a report of an interview with Thomas A. Edison goes on to say that the great inventor declared that: "One of the highest duties of the President is to keep the Government out of business. It is his biggest job and I should include in that job the clearing out of the bureaucracies which are growing up in Washington and becoming a wasteful nuisance. . . . The Government never really goes into business for it never really makes ends meet, and that is the first requisite of business."

Presuming this to be a correct report of the celebrated American, one may be permitted to enquire if he has seen the latest result of the British Post Office business with its few odd millions on the correct side of the balance sheet, let us say, 40,000,000 dollars as a gift to the Treasury?

As regards the side-kick at bureaucracies in Washington, one might substitute "Whitehall" and with a very brief examination of our own newspaper files discover paragraphs certainly not less unkind and let us believe not less erroneous.

Taking all the nasty medicine first from our transatlantic relations which we know is administered, "more in sorrow than in anger," we may also read in the *T. and T. Age*, the editor's criticisms on certain statistics of the French *P. T. et T.* concerning which and flaggelating both administration and its public the writer says:—"It may be said in general that the French public has not yet learned how to use the telephone to the best advantage. On the other hand the notoriously poor service offered by the present equipment and administration of the system in France, certainly accounts for much of the failures."

No doubt other pens than that of the present writer would be better able to deal with these friendly criticisms—for one realises that they are really friendly. It is a strange coincidence that a current number of the *Electrical Review* reports that so far as the administrative side of the French question is concerned one very vital matter is being actively dealt with by a reduction of the number of lines under the charge of individual operators. Thus at the following Paris exchanges the number of lines has been respectively reduced as follows: Boulogne, 260 to 200; Montreuil, 240 to 180; Vincennes, 320 to 240 (later to 200); Levallois, 200 to 180, and so on.

Esperanto!—It cannot be denied that Esperanto is making steady headway. That it will ever actually take the place of any mother-tongue one may have very definite doubts. It is certainly becoming popular in many countries, amongst those Postal, Telegraphic and Telephonic employees, where the duties of these officials bring the latter into more or less personal contact with foreign nations. Accordingly we may note with special interest the anticipated presence of no less than 1,300 delegates from forty countries to this year's World Congress of Esperantists, to be held in Oxford during the month of August. In addition to the usual business meetings, a "Summer University" is being held at the same time. Lectures and the subsequent discussions will be in Esperanto. Will the British Post Office provide an Esperantist interpreter for Oxford Post Office business? If the University cannot provide one, there should be no difficulty in obtaining a qualified person from one if not all three sections of the G.P.O.

Round the World.—ALGERIA.—La Société Lignes Télégraphique et Téléphoniques is engaged in laying an underground telegraph and telephone cable between Oran and Algiers and Constantine. The section between Algiers and Maison has been completed. AUSTRALIA.—A Cabinet sub-committee has been appointed to consider the whole position of wireless and to make suggestions for its reorganisation. A telegram from the Sydney correspondent of the London *Daily Telegraph* states that the Director of Postal Services there, Mr. H. P. Brown, commenting on the situation (the 11th ult.) is reported to have said that the matter of the assimilation of the cable and wireless rates had not yet been agreed upon. "The question of tariffs was in the hands of the Imperial Advisory Committee on which Australia was represented," but he had no knowledge of any action taken. AUSTRIA.—The new draft Austrian Electricity Act contains clauses which have been drafted for the protection of radio listeners against interference caused by electrical apparatus. There is however, dissatisfaction among listeners and the Austrian Broadcasting Company (Ravag) is discussing the matter with the Federal Ministry of Commerce. BELGIUM.—Radio-Belgique states that two high-power radio stations are under construction at Veltham, one for Radio-Belgique and the other for the N.V. Radio. The two transmitters says. *World Radio* will deliver 15 kw. to the aerial, sufficient, it is computed to cover the whole of Belgium. CANADA.—The Bee Telephone Co. is constructing an important extension by constructing a new line from Oshawa to Sudbury (Ont.) *via* North Bay. 10,000 poles and 9,000 miles of wire will be used. The line will be specially suited for the carrier system of wired-wireless operation. This stretch of line is a link in the scheme to span the dominion from the Atlantic to the Pacific and will place Halifax in direct communication with Vancouver. CHINA.—According to reports from the *Times*, *Electrical Review* and a German report from Shanghai, the situation as regards the agreements between China and the Eastern Extension and Great Northern telegraph companies, which expired in December last, is still in suspense though the companies are continuing their activities. The Chinese Government still owes the companies considerable sums of money. It is also announced that a "Communication" loan of 10,000,000 Mexican dollars for the reorganisation of the China cable telegraph and telephone systems has been issued. To add to the complications, it is known that wireless installations are now being erected for the Chinese Government with American capital. FRANCE.—The Automobile Association has been officially informed that tourists may take wireless sets into France either mounted or as personal luggage. Duties and taxes must be paid, *and* no refund will be granted on re-exportation. The duty on British sets is 22% *ad val.*, and in addition there is a luxury tax on sets and on loud-speakers. *Why spend your holidays abroad?* *World Radio* reports that the Paris Municipal Council has adopted a resolution recommending the State to provide all lighthouses with two-way radio apparatus. The idea has considerable support. GERMANY.—*The Reichspostamt* has decided to erect a new high-power transmitter at Heilsberg, East Prussia. Prospective power 60 to 100 kw. with two aerial wood latticed masts of 32.5 ft. More than twenty high-seas fishing steamers are now equipped with two-way radio sets, says *The Electrical Review*, giving direct communication between owners and captains at a minimum distance of 200 miles. GREAT BRITAIN.—The Great Western Railway Company is considering the construction of a Beam radio beacon to assist the navigation of its steamers in Plymouth Sound during fog. The *Times* understands there are some financial difficulties as to annual expenditure on maintenance at present. The Picture Telegraph service between London and Berlin has now been extended to Frankfurt Main and to certain English provincial towns. The British Broadcasting Corporation's accounts with the Post Office show cash receipts for wireless receiving licences as £1,358,187. Of this the B.B.C. receives £887,616, the Post Office (for expenses) £178,686, and the Treasury £291,885. ITALY.—*Reuter's Trade Service* informs us that the Minister of Communications has been authorised to grant the sum of 500,000 lire as the Government's contribution towards the cost of installing the Vatican's wireless station. *The T. and T. Age* states that the Vatican's Automatic Telephone Exchange is made up of no less than 800 lines. *The Electrical Review* announces the opening of a very powerful new broadcasting station at Santa Palomba, 14 miles south of Rome. Antennæ power 50 k.w., height 330 ft., wavelength 441-8 metres, and estimated cost £150,000, installed by Radio Corporation of America. INDIA.—The Indian Broadcasting Company is expected to discontinue operations shortly, if it has not done so before these lines are in print. Expenditure has exceeded income by £15,000 annually, cables Reuter's Bombay Agency. As these lines

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go to the press there seems to be more than the mere possibility that the Government of India will take over the affairs of the I.B.C. IRISH FREE STATE.—The Government has sanctioned plans for the erection of the high-power transmitting station at Athlone at a cost of £70,000. There are already two broadcasting stations in the I.F.S., one at Dublin and the other in Cork. The licence revenue amounts to £13,000 per annum, which would be insufficient to meet expenses were it not for the thirty odd thousand pounds derived from imported sets, &c. It is suggested that all radio dealers should keep a register of all sets, sales and repairs, in order, apparently, to check the number of sets actually in use with that of the number of licences issued! JAPAN.—*Reuter's* Tokio agency reports that a direct wireless telegraph service was successfully opened between Japan and England on January 17th last, made possible, it is added, by improvements effected by the Marconi Company. PERU.—*The T. and T. Age* announces that the International Telephone and Telegraph Corporation have acquired a controlling interest in the Peruvian Telephone Company. The latter company operates more than 65% of the telephones in Peru. The All America Cables, Inc., an affiliated company of the International T. and T. Corp. has operated the submarine cables to Peru for many years. The Peruvian Government apparently have granted a concession to All-America Cables to lay submarine cables for telephony, *but* a vital stipulation is that such cables shall be available for telegraphic or telephonic use, or simultaneously for both. According to *Reuter's Trade Service* the concession still further stipulates that within two years the company must erect wireless stations with the U.S.A., Spain, Argentina, Chili and Central America for telegraphy, and for wireless telephony, with Spain at least. PORTUGAL.—A draft decree was recently published showing that Portugal intends making radio-telegraphy, radio-telephony and broadcasting a State monopoly. There appears to be some vehement opposition, largely because of the necessary restrictions that would be imposed upon amateurs. U.S.A.—*The T. and T. Age* announce that the W. Union Telegraph Company have installed over 125 telegraph stations for air-transport companies during the last seven months. The service will be similar to that maintained by a railway company. In the State of Pennsylvania a complete network of police telephones has been established. Ninety-five towns and cities are linked up and over one hundred local authorities. For transmitting messages from the various headquarters a telephone-typewriter (*query* teleprinter) is used which types the message simultaneously to each local station. *Funeral Services by wireless.* It is proposed to broadcast funeral services in New Jersey. The N.J. undertakers affirm that the services could be accurately timed from the broadcast stations! The new transcontinental radio telegraph circuit of the Mackay Radio and Telegraph Company between the Atlantic and Pacific coasts was opened on Nov. 15, and appears to be doing well. The transmission from New York by remote control to Sayville is on 36 metres, and has been successfully picked up near Pitcairn island, nearly 5,000 miles from the American station. (Compare with note under Canada, above.)

Personal, &c.—Sir H. A. Kirk, late director-in-chief of the Indo-European Telegraphs, left £3,217 gross and £3,011 net personalty.

C.O.D.O.C.—Mr. Arthur Brough has again been congratulated by *The Daily Telegraph* musical critic on his "efficient little orchestra." This was on the occasion of the Centels production of *Les Cloches de Corneville* at the Cripplegate Institute.

Messrs. Creed & Co., Ltd., Croydon, have formed a new company in Germany, associated with the International Telephone and Telegraph system, which is to be known as *Creed Telegraphen Apparate G. m. b. H.*

The Postmaster-General informed the Bournemouth Council, in reply to a resolution suggesting legislation to provide for the laying underground of wires which would interfere with local amenities, &c., that "of the 8,000,000 miles of telephone and telegraph wire owned by the Post Office 6,800,000 miles were actually underground—a greater proportion than in any other country in the world."

The Carrier Current System.—"The use of the carrier-current systems is no more expensive than the common telegraph where transmission over distances of 1,500 miles are involved. . . . The carrier system is more immune to interruptions from power lines and aurora borealis."—John McMillan, Telegraph Manager, C.P.R.

J. J. T.

RETIREMENT OF MR. CRAWFORD MILLAR.

MR. CRAWFORD J. MILLAR, who is retiring from the position of District Manager of Telephones for the Bristol District, entered the service of the National Telephone Company at Glasgow in 1889, and when that company's business was transferred to the State in 1912 he was acting as the company's Assistant Superintendent for Scotland. Mr. Millar has thus over 40 years' telephone service to his credit. During that long period he has been located from time to time at Glasgow, Nottingham, London, Exeter, Edinburgh and Gloucester, and since Novermber, 1921, he has been in charge of the Bristol telephone district. The first public telephone exchange in Bristol was opened in 1881, and at 1921 the business had been built up to the extent of 15,400 telephones. It is of interest to record, as illustrative of the bounding nature of telephone development, that there are now over 30,000 telephone stations in the district, so that the number of telephones added during the past 8 years has been almost equal to the number obtained during the preceding 40 years.

On the afternoon of Jan. 28, at a meeting in the Telephone District Office at 11, Woodland Road, Mr. Millar was presented with a McMichael super portable wireless set and an easy chair, from his colleagues in the Bristol district. Mrs. Millar was at the same time presented with an opal ring. The presentations were made by Mr. Pugh, Postmaster-Surveyor of Bristol, and included in the company were Major Batchelor, D.S.O. (Superintending Engineer), Messrs. Gray and Baxter (Assistant Superintending Engineers), Mr. Rattue (Sectional Engineer), Mr. B. Waite (District Manager of Telephones, Cardiff), Mr. Cass (Assistant Postmaster), Mr. W. Newton, Chief Superintendent (Postal), Mr. O. J. Harvey, Chief Superintendent (Telegraphs), Dr. Kemm (Medical Officer), Mr. J. T. M. Smith (Chief Clerk, Telephones), Mr. A. E. M. Carey (Contract Manager), Mr. J. M. Crombie (Traffic Superintendent), and representatives of the various branches of the District Manager's staff.

Mr. Millar was also presented with 3 fine etchings of Bristol from the Telephone District Managers of Great Britain and Northern Ireland. The presentation was made on their behalf by Mr. Waite, of Cardiff.

[A portrait and biographical sketch of Mr. Millar appeared in the April 1928 issue of the *Journal*.]

WIRELESS TELEPHONE SERVICE WITH SHIPS AT SEA.

THE Postmaster-General announced on Feb. 21 that following on the success of wireless telephone communication from the liner *Majestic* to this country on her outward voyage in the previous week, the experimental service would be extended on the homeward voyage to cover calls to as well as from the vessel. It was proposed to provide service daily between the hours of 12 noon and 6 p.m., commencing with Sunday, Feb. 23. The minimum charge is £4 10*s*., covering 3 minutes' conversation, and £1 10*s*. per additional minute or fraction thereof. A "Report Charge" of 10*s*. is payable (in place of the normal charge) when for any reason beyond the control of the Post Office the person asked for cannot be found and connected up with the caller.

Subscribers desiring to book a call to the *Majestic* should proceed as when booking an ordinary trunk call, and when put through to the recording operator should ask for "Ship Service." The caller should give, in addition to the name of the passenger with whom conversation is desired, his own telephone number and the name associated with that number in the telephone directory.

As indicated in an earlier notice a similar service will be available to and from any ship on the North Atlantic route which is fitted with a suitable type of wireless telephone apparatus.

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EXTRACTS FROM TELEPHONE PROGRESS REPORTS FOR 1929.

LONDON.

Growth in the London Area.—The direct exchange lines provided have increased from 181,606 in December, 1921, to 384,739 in December, 1929, i.e., an increase of over 110% in eight years.

The continued growth of the system is further illustrated by the fact that there are now 137 exchanges in the London area as compared with 130 last year. This number includes 24 automatic exchanges, 109 manual exchanges, 2 Toll exchanges, the Trunk exchange and the Tandem exchange. There has been an increase of 28,756 exchange lines during the year, which is about 8%, the total on Dec. 31 being 384,739. In addition, there are 16,641 private telephones, i.e., telephones provided by the Post Office but not connected to the public exchanges. The total number of telephones (exchange and private) in the London area at the end of 1929 was 661,977, representing an increase of 47,794, or 7.8%.

The average number of calls of all classes handled in the London Trunk Exchange daily during 1929 was 60,050.

Toll Service.—The area served by the Toll Exchange has been extended by the inclusion of towns formerly served by the Trunk Exchange. The Toll Exchange now serves the South-East portion of England, from Aldeburgh and Felixstowe on the East to Portsmouth and Milford on the South Coast. The northern boundary of the area embraces the towns of Diss and Bedford, and the Western boundary includes Bicester, Basingstoke and Southampton. A full list of the provincial towns and villages obtainable through Toll Exchange appears in the London Telephone Directory.

The outgoing traffic from London to towns in the Toll area is dealt with at an exchange known as Toll A, and the total number of provincial lines connected to this exchange has increased from 939 lines in 1928 to 1,177 in 1929. The incoming traffic from the same area is dealt with at Toll B Exchange, and the number of provincial lines connected to the latter exchange has increased from 690 lines in 1928 to 898 lines in 1929. Part of the increase is due to the transfer of territory from the Trunk Exchange. The more rapid service possible under Toll conditions has resulted in a marked increase of telephone traffic in the area transferred.

The total traffic dealt with daily in the Toll Exchange was 122,125 calls, representing an increase of 27% over that of the previous year.

Local Service.—The number of local calls originated during the year 1929 was 647,631,825, an increase of 9.3% over the figure for 1928.

Conversion to Automatic Working.—Substantial progress has been made in the conversion to automatic working of subscribers' lines within the 10-mile radius from Oxford Circus. In this area about 18% of the whole number of lines are connected to automatic exchanges, as compared with 6% at the same date last year. Approximately one-quarter of the total originated calls in the London area are now dealt with wholly or partially on automatic equipment.

The introduction of automatic working on a large scale in such a complex area as London has, necessarily, been accompanied by difficulties. These difficulties, however, have not proved greater than was anticipated, and the system is yielding good and improving results. The advantages of automatic working will be realised still further as subscribers become more accustomed to the new system. The significance of the various tones used to indicate to a subscriber that (*a*) his line is free for dialling, (*b*) the wanted number is engaged, (*c*) is being called or (*d*) is unobtainable, is being better appreciated, but there is still a marked tendency on the part of some subscribers to abandon their calls before the called subscriber has been able to reply. Better results are obtained if, after allowing a reasonable time for the called subscriber to reply, the number is dialled a second time after a short interval of time instead of enlisting the services of an operator.

Much trouble is experienced, especially in the "Busy Hour," owing to delay in answering the telephone. Such delays not merely cause inconvenience and annoyance to the calling subscriber but also hold up plant which, otherwise, would be free to carry calls for other subscribers. It is hoped, however, that as the use of the telephone extends, subscribers will appreciate that it is in their own interest to see that their telephones are answered promptly and that conversations are not unnecessarily prolonged. Time and annoyance would frequently be saved if called subscribers would at once give their names or the name of the firm instead of saying "Hello."

Incidentally, it may be mentioned that the use of the dial by blind subscribers has been facilitated by the provision of a "nick" in the edge of the finger plate opposite the numbers 4 and 7. This has been found to be quite effective.

New Exchanges, Buildings and Sites. Automatic Exchanges.—During the past year 16 new automatic exchanges have been opened, viz.:—

Western (Kensington Area), Archway (Tollington Park, Hornsey Road, Crouch End), Reliance (Kennington Area), Edgware, Metropolitan (City of London), National (City of London), Mitcham, Hillside (North Finchley area), Ilford, Temple Bar (Covent Garden and Strand area), Beckenham, Maida Vale, Fulham, Flaxman (Chelsea area), Colindale (Kingsbury area), Hendon.

These new exchanges provide for an equipped capacity of 80,000 lines.

Apparatus is being installed in the following automatic exchanges, which will have a total equipped capacity of 32,500 lines:—

Addiscombe, Fairfield (Croydon area), Amherst (Hackney area), Gladstone (Cricklewood area), Macaulay (South Lambeth area), Primrose (St. John's Wood area), Shepherds Bush, Livingstone (Norwood area).

Equipment specifications have been issued for six exchanges having a combined initial capacity of 31,000 lines, whilst preliminary arrangements are in hand for other exchanges, bringing the total number of automatic exchanges to be constructed in London during the next five years to 47.

New buildings are in course of erection for the accommodation of the following automatic exchanges:—

Acorn (Acton area), Gulliver (Kentish Town), Hampstead, Leytonstone, Mayfair, Perivale, Pollards (Norbury), Prospect (Barnes), Terminus (King's Cross area), Whitehall.

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Asbestos Covered Wire,
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P. ORMISTON & SONS, Ltd.
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Braided and Twisted Wires, Bare Copper Strand and Flexibles of any construction. Wire Ropes and Cords, down to the finest sizes, in Galvanized Steel, Phosphor Bronze, &c.

WHERE TO STAY.

FOREST OF DEAN.—SEVERN-WYE VALLEYS.—BEAUTIFUL HOLIDAY HOME (600 ft. up). 80 rooms, extensive grounds, motors, golf, billiards, tennis, bowls, croquet, dancing. Electric light. Boarders 52*s.* 6*d.* to 70*s.*—Prospectus: Littledean House, Littledean, Glos.

BOARDING SCHOOLS and Colleges in England, any district.—ALL CLASSES, Boys or Girls. Fees from £40 to £200 yearly. Full particulars supplied to parents free; state your requirements.—F. LAVELL BATTEN (T.T.J.), Scholastic Agent, 93-94, Chancery Lane, London, W.C.2. 'Phone, Holborn 6105.

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LIVERPOOL.

New and Improved Exchanges.—New exchanges have been opened for service at Burton and Knowsley and extensions of existing exchanges were carried out at Ashton, Birkenhead, Bromborough, Crosby, Gateacre, Heswell, Huyton, Kingsley, St. Helens, Warrington and, in the Isle of Man, at Castletown and Douglas. It has been decided to open new rural (automatic) exchanges at Hale (Widnes) and Knowsley in 1930, the latter replacing the temporary manual exchange opened in 1929, and buildings to accommodate the apparatus are in course of erection. A new manual exchange will also, it is anticipated, be opened at Neston and extensions of existing equipment are projected at Lymm, Mossley Hill and Rock Ferry. Work continues on the new Exchange Building at St. Helens and it is anticipated that the building will be ready for the installation of the plant in 1930.

Telephone Progress and Increase in Number of Telephones.—During the 12 months ended Sept. 30, 1929, the number of new telephones fitted was 7,259. After allowing for cessations, the net increase was 3,215 telephones, or 4.6% on the total at Sept. 30, 1928, which is not quite so satisfactory as in the previous year, when the net increase was approximately 5.75%. This is due not only to a smaller number of new stations but to an increase in the number of cessations, for which the removal of businesses from Liverpool to London has been partly responsible.

The number of telephones has increased from 34,910 in September, 1912, to 72,644 at September, 1929, a growth of 108% in 17 years. The figures for each year during that period are shown in the Appendix.

During the year the canvassing staff has been kept busy, and every effort has been made to ensure that the non-subscribing public are made conversant with the rates and the advantages of becoming telephone subscribers. The development in private-house telephones has been maintained and the ratio of these to business telephones continues to increase. Development in this direction has, no doubt, been stimulated by the recent extension from 1½ to 2 miles of the radial distance from the exchange which is covered by the basic rental charge for a telephone. For subscribers between these distance limits this represents the substantial reduction of £2 per annum in the telephone rental charge.

Telephone Traffic.—During the past year there has been a still further substantial increase in the number of calls dealt with in the district, the total number approximating to 70¼ millions, an increase of about 3½% over the previous year. The quality of the service has been well maintained. Written complaints were comparatively few and fewer than in the preceding year, and referred mainly to plant and apparatus faults, which are more or less unavoidable. The total number of written complaints received represented only one complaint to approximately every 49,000 calls dealt with.

[*Other reports held over*].

PROGRESS OF THE TELEPHONE SYSTEM.

THE following is a brief review of the growth in the British Post Office telephone system during the year 1929.

The total number of stations working in the Post Office system at Dec. 31, 1929, was 1,848,468, representing an increase of 125,885, or 7.3% for the year. The figures for London, England and Wales (excluding London), Scotland, and Northern Ireland separately are as follows :—

	Total No. of Stations.			
	At Dec. 31, 1928.	*At Dec. 31,* 1929.	*Increase. No.*	*Increase. %*
London	614,183	661,977	47,794	7.8
England and Wales (excluding London)	931,803	999,529	67,726	7.3
Scotland	155,193	164,125	8,932	5.8
Northern Ireland	21,404	22,837	1,433	6.7

Residence rate installations at the 31st December, 1929, numbered 416,296, the net addition during 1929 being 40,955 or 10.9%, compared with a net growth in business (subscribers) exchange installations of 24,282 or 3.8%. At the 31st December last, the percentage of residence rate subscribers to the total exchange subscribers was 38.8, as compared with 37.3 a year previously and 25.1 in July, 1922, when the reduced tariff for residence lines was first introduced. In the London Telephone Area nearly half of the subscribers' lines are now rented at the residence tariff, the percentage having increased from 30.5 in July, 1922, to 48.4 in December, 1929.

The total number of call office stations at the 31st December, 1929, was 29,924, of which 5,803 were in the London Telephone Area and 24,121 in provincial districts. The net addition during the year 1929 was 4.408, or more than double that for the previous year, viz., 2,013. The substantial increase during the past year is largely the result of the recent extension of call office facilities in rural areas. Of the net growth of 4,408 for the year, 4,110 were added in provincial districts.

Of the total of 29,924 call office stations at the 31st December last, 7,541 were kiosk call offices, the net growth during the year being 1,520. The number of kiosks in the London Telephone area increased during the year from 1,214 to 1,581, and the number in the provinces from 4,807 to 5,960.

During the year 1929, 133 new rural exchanges were opened under the rural development scheme of 1922, bringing the total number opened under the scheme up to 1,373. In addition to the 1,373 exchanges opened, there were at the end of the year 89 others in course of construction.

The total number of exchanges working at the 31st December, 1929 was 4,606, of which 3,115 serve rural areas.

The number of rural party lines at Dec. 31, 1929, was 10,322, as compared with 10,382 a year previously, a decrease of 60. Actually 1,367 rural party line stations were provided during 1929, but there were 1,427 cessations, many of which probably represented transfers to exclusive line service.

The number of railway stations in rural areas connected with the exchange telephone system at the end of 1929 was 1,470, representing an increase of 434, or 42% over the previous year's total. This substantial increase (which is more than double that for the previous year), is largely due to the provision of call offices, 354 out of the total net addition of 434 circuits during the year, or 82%, being call office circuits.

At the time of going to press, the results for the last two months of 1929 in respect of trunk calls were not available, and the year's figures will be given in a later issue. Particulars of the October traffic which have not yet been quoted are as follows :—

The total number of inland trunk calls dealt with was 10,280,109, representing an increase of 679,365 or 7.1% on the October, 1928, figure. Outgoing international calls numbered 51,708 and incoming international calls 56,224, representing increases of 8,527 (19.7%) and 11,005 (24.3%) respectively over October, 1928.

Further progress was made during the month of January with the development of the local exchange system. New Exchanges opened included the following :—

LONDON—Hurstway, Redhill, Springpark (West Wickham), Theydon Bois.

PROVINCES—Summertown (automatic) ; Aldbourne, Bassenthwaite Lake, Fenwick, Hollington, Inverkeilor, Kilchattan Bay, Kimpton, Kincaldrum, Marrburn, St. Osyth, Worlingworth (all rural automatic) ;

and among the more important exchanges extended were :—

LONDON—Thornton Heath.

PROVINCES—Boxmoor, Cheetham Hill, Crosby, Denton, Douglas (I. of M.), Gatley, Harwich, Hyde (Ches.), Ilkley, Sale.

During the month the following additions to the main underground system were completed and brought into use :—

Greenock—Wemyss-Bay

Guildford—Aldershot (Section of Guildford—Basingstoke cable)

while 78 new overhead trunk circuits were completed, and 83 additional circuits were provided by means of spare wires in underground cables.

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GLASGOW TELEPHONE NOTES.

THE subject of our portrait and notes this month is Miss Elizabeth Reid Wallace, Senior Assistant Supervisor, Class I.

Like others in the service who have risen to positions of responsibility, she commenced her career by joining the operating staff of the late National Telephone Company, subsequently transferring to the Glasgow Corporation Telephones, eventually rising to the positions of Supervisor and Assistant Chief Operator. On the transfer of the Glasgow Corporation Telephones to the Post Office she was graded as Telephone Operator with Supervising

Allowance. The rank of Assistant Supervisor, Class II, was attained on Dec. 31, 1911, promotion to the Class I grade following on Sept. 7, 1914, which position she continues to fill with distinction, as second in command of the Glasgow Trunk Exchange.

Miss Wallace, while being an efficient officer, is popular with the staff and knows how to get the best results from them. She has no strenuous hobbies, but is fond of a good holiday and has visited most parts of the British Isles and also indulged in some trips abroad. Fancy work, music and reading are her home recreations, and rumour has it that she delights in giving pleasure by kindly actions.

"A Wonderful Thing is the Telephone."

The telephone's the greatest boon
  That ever was invented.
That's why you must install it soon,
  If not, you will lament it.

Not on the 'phone? Why, how absurd!
That's why your rival "bags the bird."
  The telephone, professional men
  Admit, is mightier than the pen.
By telephone financiers
Control their stocks, and purchase shares.
  No matter if you sell or buy
  Upon the telephone rely.
No matter WHAT you wish to do
The telephone will help you through.
  Your day's work done amusements call,
  The 'phone connects you with them all.
In times of sickness or of grief
The telephone will bring relief.
  Although you think it may annoy
  Just try it, for 'twill prove a joy.
In short, at length you must contract
For installation. That's a fact!
  So as Shakespeare says in language tickly
  If it were done "'twere well done quickly."

M. L. TULLOCH.

The staff of the District Manager's Office and their friends met in the Grand Hotel on Monday, Jan. 27, to bid good-bye to Mr. G. C. Dewar before he left to take up a higher duty at Birmingham.

The entertainment, which was designed with a view to meeting various tastes, opened round the whist tables. After propitiating the God of Chance, tea was served and the whist winners received their prizes, the presentation of which was carried out by Mrs. Law. The prime desideratum of the evening then followed when Mr. Dewar was presented with a mahogany bureau from the staff. The presentation was made by Mr. Coombs, who in words well chosen, paid a glowing tribute to Mr. Dewar as a colleague and a man. Mr. Dewar then conveyed his thanks to the staff in his inimitable manner. Mr. Law and Mr. Wright (who occupied the chair) also spoke as to Mr. Dewar's sterling qualities. When it is considered that the keynote of the speeches was sincerity, nothing more need be said of the high esteem in which Mr. Dewar was held.

The latter part of the evening was spent in song and readings, and worthily did the artists earn the thanks of the company suitably expressed by Mr. Lucas. In conclusion, it must be said that the arrangements for the function were such as would satisfy the demands of the most austere critic, and everyone who was present must feel a sense of indebtedness to Mr. Murray and his committee for their efforts to furnish a memorable evening—an evening which must live in the annals of the Glasgow Telephones.

Glasgow Post Office War Hospitals Entertainments Committee.—Under the auspices of the above committee the staff of the District Manager's Office provided an entertainment at Ralston Hospital for totally incapacitated ex-service men. A special tea was given and all the little extras which make a social evening a success were provided and thoroughly enjoyed by the men. Mr. Law, Chief Clerk of the telephones, presided. The main item on the programme was a whist drive, and play for the prizes was very keen indeed. Mrs. Law presented the prizes. Mr. D. Reid, Contracts, gave two monologues which were greatly enjoyed. Miss McGill, of the Fees Branch, who organised the evening, led the community singing. Dr. Vickers, on behalf of the patients, thanked the staff of the Telephones and the committee for the splendid evening and also for their continued kindnesses to the patients at Ralston. Mr. Coombs, in reply, said that in coming to the hospital the staff were only endeavouring to repay a small instalment of the debt we owed to the men who had done so much for us during the dark days. He said that the activities of the Committee were only possible through the magnificent generosity and enthusiasm of the telephone girls, who were as keen to-day as when the war was in progress. Auld Lang Syne brought a pleasant evening to a close.

On leaving Bridgeton Exchange on Jan. 25 to take up new duties outside the Service Miss M. F. Gilmour was presented with a leather hand-bag by her colleagues as a token of their appreciation and of their best wishes for her future success.

Spirella says: The main-*stay* of the Service is woman.
Reiditski says: That's true. Corset is.

FOR OUR ADVERTISERS.

The following contracts are open and all references should be made, unless otherwise stated, to the Department of Overseas Trade, London, S.W.1.: *Australia*, Melbourne, Postmaster-General's Department. Mar. 11. Supply of bells and buzzers (Schedule C. 552) (Ref. B.X. 603). *Morocco*, Rabat, Posts, Telegraphs and Telephones Administration. Mar. 13. Supply of glass insulators, bronze and copper wire, and galvanised ironwork (Ref. B.X. 6140.) *Australia*, Melbourne, Postmaster-General's Department. Mar. 24. Supply of resistances and reactances (Schedule C. 557) (Ref. B.X. 6046). Melbourne, Postmaster-General's Department. Same date. Supply of dial parts (Schedule C. 555). Melbourne, Postmaster-General's Department. Mar. 25. Supply of cordless telephone switchboards (Schedule C. 566) (Ref. B.X. 6071). *New Zealand*, Wellington, Posts and Telegraphs Department. Mar. 26. Supply of 10,000 double-ended wrought-iron arm-bolts (Ref. B.X. 6091). Wellington, Posts and Telegraphs Department. Mar. 31. Supply of spare parts for B.P.O. dial No. 10 (Ref. B.X. 6097). *Australia*, Victorian Railway Commission. Mar. 30. Supply of d.c. neutral relays for power signalling purposes (Contract No. 43,457) (Ref. B.X. 5793). Melbourne, Postmaster-General's Department. April 1. Supply of submarine cable (Schedule C. 561) (Reference B.X. 6070). Melbourne, Postmaster-General's Department. April 15. Supply of cord-type switchboards (Ref. B.X. 6135). *Egypt*, Ministry of Public Works. April 30. Supply and erection of H.T. overhead transmission lines in isolated basins of Upper Egypt. Specifications, &c., from the Chief Inspecting Engineer, 41 Tothill Street, London, S.W.1. £10 *5s. not* returnable.

Memo.—The British Chamber of Commerce Journal, in Sao Paulo, directs attention to the possibilities of Brazil as a market for British-made wireless apparatus, especially the all-electric type working on a.c. at 110 volts, 60 cycles, but warns possible exporters that American practice has accustomed the Brazilian public to a type of valve quite unlike the British "staggered" pins, and therefore all valves would have to be of the transatlantic pattern.

J. J. T.

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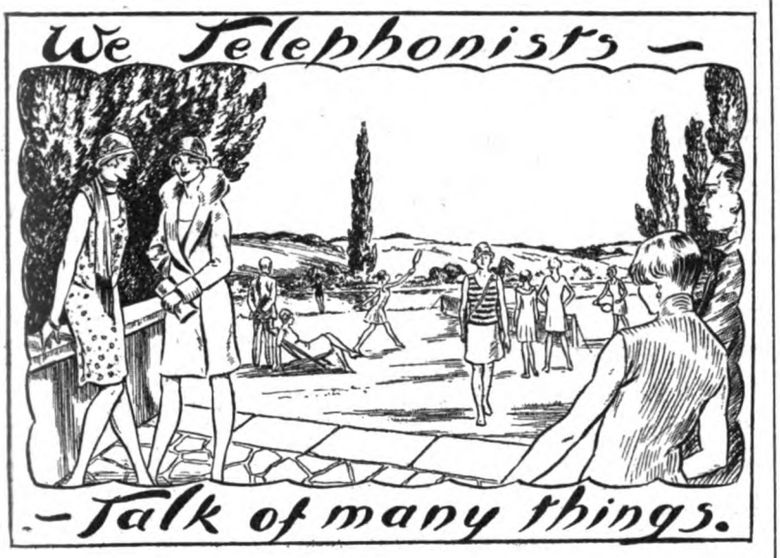

March.

So this is March. One feels that one ought to write a poem about it. Many important things happen in March such as Ides and Hares, Area Transfers and Mallows. Then there's Lady Day which, although a quarter day, is just as long as any other day, but far more terrible. Indeed, many people cannot think of it without emotion or at any rate feeling or being moved. During March, too, we meet the twins Quinqua and Quadra Gesima. They always seemed to me most mysterious, and long before I knew what they were I pictured them as a couple of giants—something like Gog and Magog—but quite genial old fellows. If I ever keep giraffes I think it would be nice for them to be known by these names. Indeed, it seems a pity that two such splendid names should be going begging, as it were, and I feel that I want to buy two giraffes at the earliest opportunity. In time, of course, one would call them Quin and Quad as a mark of good-feeling and affection. Possibly when they got playful there would not be time enough to call them by their full names or it might not be necessary to call them at all. This, however, is by the way. By far the most important events of the month are Pancakes and Spring, and of the two it is difficult to say which is the greater. One is somehow torn between the appeals of duty and beauty. To eat pancakes is undoubtedly a duty and one out of which we are entitled to as much pleasure as we can get. Of Spring I need say nothing because so much has been, is being, and will continue to be written about it. It gives rise to onions and cleaning, lambs and primroses and the first cuckoo. Birds begin building—somewhat in the Drage manner—and the young man's fancy also turns Dragewards.

March is really worth a poem, don't you think ? I should like to write one, but my difficulty for the moment is that the only word I can remember which rhymes with March is starch, and that doesn't strike the sympathetic poetic chord. It seems just a bit too stiff. Of course there's larch, which is rather wooden, or parch which suggests a drink—Ha ! a fine idea—let's !

PERCY FLAGE.

City Exchange New Year Party.

On Jan. 24 City Exchange celebrated the New Year by holding a party in aid of the Poor Children's Tea, in the Dining Hall at G.P.O. South. The preliminary arrangements were ably conducted by the Entertainment Committee.

Mr. Furze was asked to act as Master of Ceremonies, and under his pilotage affairs went with a swing. About 250 members of the City Exchange staff and their friends gathered soon after 6.30 p.m., all in excellent spirits, and prepared for plenty of fun. The floor was cleared for dancing, a band had been engaged for the evening, and ample provision had been made for the serving of light refreshments.

Dancing and games occupied most of the time until soon after 10 p.m., and Miss Knapman presented the prizes for the various events to the successful competitors. An exceptionally enjoyable evening it proved to be, and we look forward with confident anticipation to many similar opportunities for good fellowship and mutual entertainment.

H. F. E.

A New Year's Party given by the City Exchange Staff to the poor children in the Southwark District on Feb. 1 was in every way a great success. At 4 p.m. 200 girls and boys arrived ready for their tea, and seated themselves at the tastefully decorated tables, behind which helpers from the Exchange were ready to wait upon the children. They needed no second bidding, after the grace was said, to start away on the food, and they did not sit back again until " they were ready to bust," as one little fellow remarked.

After the tea, Miss Knapman kindly recited the " Pied Piper of Hamelin," which was followed by some community singing, until the Marionettes arrived and amused both children and helpers for nearly an hour.

The Vicar then told the children to remain seated while Father Christmas and the Good Fairy (this part being realistically carried out by a City Telephonist) distributed dolls to the girls, and toys to the boys. On leaving the hall after a very enjoyable evening, each child received a packet of chocolate and a new penny.

P. O. P.

Our Portrait Gallery.

No. 6.—MISS F. NIGHTINGALE.

Miss Florence Nightingale—actually a connection of her illustrious namesake—is the Supervisor-in-Charge of Putney. During the early years of her service she was personal clerk to Miss Heap, first Superintendent of Female Exchange Staff in the London Telephone Service, subsequently taking up work as teacher in the Operating School with occasional periods of duty as Interviewing Officer ; and passing from this to the position of Supervisor-in-Charge.

Our subject's hobbies are walking and mountaineering anywhere—but especially in Italy—singing, sketching, and sculling ; the last named accomplishment being particularly appropriate in a Supervisor-in-Charge of Putney, an exchange whose urgent traffic problems rightly claim the personal observation " on the spot " of all good traffic officers while the University crews are on the tideway !

Poor Children's Tea.

The Staff of the Battersea Exchange entertained 130 poor and crippled children at St. Philip's Hall on Saturday, Feb. 1. Iced cakes and dough-nuts ; bon-bons and balloons ; and heaps of other good things, dear to the hearts of children, were in abundance.

Then there was the Conjuror. How delighted they were with him, and how they all shouted together and told him where he had put the ball that had mysteriously disappeared.

Last but not least there was the Fairy Play, "Goody Two Shoes," written by the " Witch that lived near the Well," and acted by an " All Battersea " cast. This play was received in eloquent silence, broken only by occasional exclamations of admiration and bursts of laughter.

After the children had gone, somewhat tired, perfectly content, and laden with gifts, more happy hours were spent by the Staff and their friends, as previous experience had shown that it would be quite impossible to cease having a good time so soon.

Battersea considers itself fortunate in having its share of those delightful people who are able to rejoice in and organise social events.

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The following lines were written by an onlooker at the play :—

Little Goody Two Shoes.
(A Play.)

The play for you and the play for me
Is the one that's given by "Battersea,"
Rendered in the St. Philip's Hall
For poor little children, one and all.

There's singing and dancing, and fun and glee,
And oh ! how jolly I think it would be
Dressed as the Parson, with solemn look,
Complete with gaiters, glasses and book.

The King in rich raiment, red and gold,
His daughter gave to a Prince whose bold
Adventures ceased at a witches' hovel,
To find the Princess with broom and shovel.

There were Eastern maids and fairies blue,
And butterflies of gorgeous hue,
And little children like you and me
Playing and singing, merrily.

The beautiful Princess was under a spell,
Cast by the witch living near the well,
Until the fairies sought and found
And set the Princess homeward bound.

The King and Queen and people too
Were joyed to greet their maid anew,
But the Prince who'd wandered o'er the land
Promptly asked for the maiden's hand.

And now that all is peace and goodwill,
(For the witch has vowed to do no ill),
I'll wend my way home, and think again
Of the play that was worth a trip in the rain.

BATTERSEA.

DEAR EDITRESS,—I wonder why my sonnet (?) to the C.C.I. has been mis-coded (more or less) and masquerades as C.C.S. ! Perchance it is a printer's error, or else (the thought fills me with terror !) my writing has so retrogressed the poor chap had to guess the rest !

Howe'er it be—'tis very plain such slips must not occur again. In future C.A.S. agrees to cross her eyes and dot her teas !

Postscript.

Fie ! fie ! dear Sir Percy—
I pray you have mercy !
Don't dance on my humble apology.
With comments so witty—
'Tis surely a pity
To waste such unique phraseology !

I "got you" the first time !
But this is the worse time
I've had since we started hostilities ;
My name isn't Sam,
But I don't care a—button !
I can smile at your cute
Versatilities !

I cannot compete
With your phrases so neat,
But a woman, forsooth, my dear Percy
(As doubtless you've heard !)
Must have the last word—
So here endeth this long contro*versy* ! C. A. S.

Contributions to this column should be addressed : The Editress, "Talk of Many Things," *Telegraph and Telephone Journal*, Secretary's Office, G.P.O. (North), London, E.C.1.

C.T.O. NOTES.

Promotions.—Messrs. F. C. Whitaker, Overseer to Assistant Superintendent ; P. W. G. Stubbs and C. W. Gould, Telegraphists to Overseers ; Miss A. C. West, Assistant Supervisor to Supervisor.

Retirements.—Messrs. J. W. Duncan, F. T. Stimpson and J. W. Brown, Assistant Superintendents ; J. W. Attwooll, T. E. Hodgson and A. W. Bing, Overseers ; and A. H. Ashby and R. W. E. Lasham, Telegraphists.

Obituary.—We regret to record the deaths of several old friends in Leonard H. Tinson, Adam Gordon, "Bobbie" Weeks, Harry Oakman and T. Boulden. We extend our sympathy to all the relatives in their bereavement.

C.T.O. Art Society.—Mr. Hugh Davey, one of the Society's ablest and most enthusiastic members, has kindly consented to give demonstrations of his method of work in water colours. These meetings are open to non-members of the Society and anyone interested is cordially invited. Further particulars may be obtained from Mr. E. J. Shaw, C.T.O.

Reunion of the Retired Supervising Officials of the C.T.O.—The tenth reunion of "The Old Brigade" took place on the 8th January with a record attendance. No fewer than 97 sat down to tea and "tuned in" to a flow of tongues reminiscent of bygone days.

Mr. James Bailey, I.S.O., was in the chair, supported by Mr. W. S. Fisher, who is 83 years of age. To mention each individual would occupy too much space, but the whole party spent a very happy time together.

Sport.—A dance was held on the 10th January on behalf of the fund for the "Radway Cup"—for tennis—and it was a great success, 300 dancers having a most enjoyable evening. As a result a very fine cup has been purchased for competition.

Football.—The Centels have had a most successful tour of Southampton and Portsmouth. The Head Postmaster of Southampton attended the match which was played on the Civil Service Ground, and we were beaten by 4 goals to 2. Against Portsmouth, however, we were successful, winning by 4 goals to 1. The Centels enjoyed a conducted tour round the Dockyard and over H.M.S. *Queen Elizabeth*.

Opera.—Les Cloches de Corneville.—This opera was presented by the "C.O.D.O.C." at the Cripplegate Theatre on 27th, 28th and 29th January, and from one point of view was better than all previous productions. This applies specially to the chorus work, the singing and dancing being excellent, and in conjunction with Mr. Arthur Brough's very efficient orchestra we were like "Oliver Twist" in wanting more. The principals were perhaps not quite the strong combination that we look for from this club. Mr. Arthur Boyce as the Bailie and Mr. Bertie Figg as his "shadow" provided the light relief. Both Mr. Blundell and Mr. Frank Barber gave good performances in their respective parts of the Marquis and Grenicheux. Mr. F. V. Morey, by his portrayal of Gaspard the miser, shows excellent promise, and, provided he gives more attention to his diction, he should be a very useful member of the club. As Serpolette Miss Winifred Lenthall gave her usual polished performance, and Miss Mabel Slade as Germaine made a very promising debut.

The whole production was in the capable hands of Mr. Donald Bidgood.

Dramatic.—The Last of Mrs. Cheyney.—The Dramatic Section will give two performances of this play at Cripplegate Theatre on 18th and 19th March. Tickets, price 3*s*., 2*s*. 4*d*., and 1*s*. 10*d*., may be obtained from Mr. J. Henry, Room 17, Central Telegraph Office.

Mr. J. W. Brown.—Saturday, 25th January, 1930, was the official date of retirement of Mr. J. W. Brown, Assistant Superintendent in Charge of Canvassing.

The spontaneous expressions of goodwill showered upon him on his last day of service by his numerous friends in various departments and the business world outside were a revelation, even to his most intimate colleagues, of the esteem in which he was held.

Entering the Service at Stockton - on - Tees in September, 1885, he transferred to London in 1890. "Jack" was a great personality, physically (he stood 6 ft. 5 in.) and temperamentally endowed with a kind and generous nature in like proportion.

With the advent of the competitive element in the Overseas Telegraph service the Department was not slow to recognise the qualifications of Mr. Brown for appointment as Outdoor Representative. His reminiscences of Pioneer Canvassing were highly entertaining. Irate complainants usually took a generous view after a chat with the "long un," but on occasion J.W. could be as firm as he was kind, as instanced by the historic occasion when a particularly impudent member of the staff was, after ample warning, suspended over a 4th floor balcony in the grip of a mighty fist.

The Beam Wireless services to the Dominions afforded a good scope for the exercise of Mr. Brown's talents, and his activities in the development of those services were of inestimable value.

His many friends have united in presenting him with a Globe Wernecke bookcase, and many good wishes will follow him to Barton-on-Sea for a happy retirement and many a good "card" on the Golf Links.

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LONDON TELEPHONE SERVICE NOTES.

Contract Branch Notes.—The business done by the Contract Branch during the month of January resulted in a net gain of 5,596 stations as compared with 5,984 stations in the corresponding month last year. Trade conditions, particularly in the City, are still depressed owing to the recent financial crash, but there is an improvement on the comparative results of the previous two months.

The spirit of the times is speed and even more speed, and it would appear from the following letter recently received that we are not behind in this respect.

("Thanks so much for your speedy response to my letter of yesterday which came in person by a "chap" who had the sign on "the dotted line" at 11.50 a.m. this morning—some speed. If the rest of the job measures up to the same standard I will be able to have the laugh on some of my New York friends who think the New York Telephone Co. is the last word on Service.")

It must be disturbing to our Press critics to read these spontaneous ebullitions of gratitude, because we appreciate how difficult it is for most people, to sit down and write in praise of something which his daily paper would never even grudgingly admit possible. We feel, however, that the telephone user must often chuckle at the things he is told happen to him, but which he himself never experiences.

A large gathering assembled at Contract Branch headquarters in Cornwall House on Jan. 24 to wish Capt. E. F. Arthur of the Development Section farewell on his promotion to the position of Postmaster of Bangor. The Deputy Controller, Mr. Pink, presented him with a silver cigarette case, pipe, and fountain pen and pencil, and spoke of his excellent qualities during his period of service in the L.T. S.and gave an interesting topographical sketch of the new Postmaster's future home. Mr. Taylor, Principal Clerk Contract Branch, in a happy speech referred to his intimate knowledge of the excellent work performed by Capt. Arthur, and amusingly referred to the extraordinary phenomenon of a Welshman returning to his own country to improve his position. Capt. Arthur, in a reply of thanks, gave a racy outline of his career in the London Telephone Service, and carried the minds of many of his colleagues back to a period, which many of them had probably long since forgotten.

The many friends of Mr. R. J. Skelton of the North West Contract Office will be glad to learn that he is now on the high road to recovery after what proved to be a very serious operation. There have been many "anxious days," but these we hope have now passed. He has left hospital and returned to his home for convalescence, and it is sincerely hoped that he will be speedily restored to his normal health and strength.

L.T.S. Football Notes.—The club met with their first defeat of the season on Feb. 1 at the hands of the Office of Works 1st division team in the 2nd round of the League Shield Knockout competition, the final score being 4-2.

The game was strenuously contested throughout and the display of the Office of Works was unlike that of a team occupying the bottom position in the league.

Other League results are as follows :—

Jan. 18, Royal Mint, won 7-2.
„ 25, War Office, draw, 2-2.
Feb. 8, Ministry of Health, won 6-2.

The club still occupy the top position in the League, but are being closely pressed by the Land Registry, who have only dropped the same number of points as the L.T.S. It seems almost certain that the championship will be decided by the match to be played between the two teams on March 1, and whichever team wins this match will almost certainly be promoted.

Several of our players have been honoured by the League in being selected to play in representative games. In the Civil Service League *v.* Nemean League, Casey and Webdale were found places, and in the match against the Business Houses League, Casey, Futerman, and Webdale were selected.

Webdale has also been asked to play in the Civil Service team agains the Royal Air Force.

The London Telephonists' Society.—The programme prepared for the occasion of the fourth meeting of the London Telephonists' Society this season was one which departed from the form usually accepted as fulfilling the aims of the Society. That this novelty appealed to the members was proved by a greatly increased attendance and the general consensus of opinion that there resulted a most successful and enjoyable evening.

A series of four papers, each with the title of "My Service," was read representing important services rendered by women. The following order was observed in presenting the different points of view :—

The London Telephone Service—Miss E. A. Hobdell, Clerkenwell School.
The Nursing Profession—Miss D. M. Merriken, The Elizabeth Anderson-Garrett Hospital.
The Saleswoman—Miss N. Ellt, Messrs. Selfridge & Co., Ltd.
The Lady Journalist—Miss K. Courlander, *Daily Express.*

Four very important branches of public work were thus explored, and it very soon became apparent that each was, in its own way, of vital necessity to the public. Apart from the specialised training naturally required for work of such widely differing types, certain qualities were found to be common in each case. The speakers emphasised especially that one should have a love of work ; from that quality naturally arises the ability to put into one's work more than is asked, and the natural result of such a condition is increased efficiency and happiness.

One lecturer particularly remarked on the need of charm to bind together in an harmonious whole the many ingredients needed to make a successful business woman, and in her definition of that elusive quality stated, to our eternal comfort, that charm may be fostered, and will grow out of the warmth of our other qualities.

In conclusion a vote of thanks to the speakers was moved by Mr. Pink, seconded by Miss Cox, in felicitous terms.

Stamford Dramatic Society.—The Stamford Dramatic Society (London Telephone Service) will give a performance of *The Best People*, a society comedy by David Grey and Avery Hopwood, at the Cripplegate Institute, Golden Lane, Aldersgate, E.C.1, on Monday, March 24 next, commencing at 7.30 p.m.

Tickets, 3*s.* 6*d.* and 2*s.* 4*d.* (reserved) and 1*s.* 2*d.*, are obtainable from Miss D. Coleman, Telephone School, Ironmonger Row, Clerkenwell, E.C.1 (Telephone Clerkenwell 0101).

National Sanatorium, Benenden.—The second concert of the season, provided by the London Telephone Service Staff, and once again under the direction of Miss Margaret Worth, was held on Saturday, Jan. 25.

The programme commenced with some community singing conducted by Mr. Hugh Williams, who declared that the audience were as keen on singing as the artistes. "John Brown's Body" and "Fire Down Below" proved excellent numbers to warm up the patients and staff. The humourous sketches by Mr. Wilfred Stracey kept the audience in roars of laughter. Miss Blodwen Lloyd, a new comer to these concerts, but a very old friend of L.T.S. audiences, charmed the listeners with her powerful soprano voice. Her duet with Mr. Hugh Williams from the Welsh opera, *Howell and Blodwen*," by Dr. Joseph Parry, proved a popular item. Their encore, "The Keys of Heaven," in which the whole company joined, was received with even greater applause, and it is evident that this duet will have to figure in future programmes as a permanent item. Mr. Harry Brunning in "Chatter and Hawaiian Music" had a great reception. The skillful manner in which he manipulated the instrument associated with the Hawaiian part of his turn proved that he, too, had won the hearts of the audience. More songs by Miss Blodwen Lloyd and Mr. Hugh Williams and syncopations on the piano by Mr. A. C. Vincent followed and another enjoyable concert was brought to a close by the singing of "Auld Lang Syne."

The Medical Officer followed with some very appreciative remarks of the artistes and the founders of the concert (the staff of the L.T.S.), and in responding Miss Worth expressed the joy it gave the artistes and their friends of the service in being able to help to cheer the patients for an hour or two.

The Sanatorium Staff provided an excellent tea and supper for the artistes and before leaving Mr. Hugh Williams thanked the Matron, Doctor, and their Assistants for their hospitality.

Another concert, the last of the season, will be given on Saturday, March 1.

Personalia.—Resignations on account of marriage :—

Telephonists.

Miss M. A. Larner, of Ilford.
„ D. F. Dolphin, of Romford.
„ G. M. Silvester, of Toll B.
„ L. F. M. Lister, of Avenue.
„ M. A. White, of Park.
„ A. A. M. Woodbridge, of Park.
„ D. R. Barker, of Putney.
Miss C. E. Marchant, of Gerrard.
„ E. W. Barlow, of Mountview.
„ H. M. Roberts, of Tandem.
„ M. B. Rose, of Lee Green.
„ A. L. M. Zeithing, of Toll A.
„ E. Beresford, of East.
„ M. A. Sadler, of Fulham.

THE Horsley Party will leave London on Friday, June 6, for Montreux, Zermatt and Aeschi (Lake Thun). £16 for 18 days tour. Apply early to Mr. J. W. Fewtrell, 48, Frewin Road, S.W.18.

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LEEDS DISTRICT NOTES.

Social Items.—The staff of the West Yorks Telephone District held a very successful Whist Drive and Dance at the Queen's Hotel (L.M.S.) Leeds, on Thursday, Feb. 13. In addition to a large gathering, which included members of the staffs of the Leeds, Bradford, and neighbouring Exchanges, and the District Manager's Office, we were favoured by the presence of Lt.-Col. Jayne, D.S.O., O.B.E., M.C. (Postmaster-Surveyor); Messrs. J. Bownass (Assistant Postmaster); J. F. Murray (Traffic Superintendent); and J. N. Lowe (Contract Manager).

Messrs. T. W. Lawrence and C. A. Atkinson carried out, very effectively, the onerous duties of M.C. for whist and dancing, respectively.

Col. Jayne, in presenting the whist prizes, said he was pleased to see such a representative gathering and that, although there were over 200 present, it would appear to be necessary to take the Town Hall for the next function, as so many more members of the staff than could be accommodated had wanted to come. He wished the "Circle" every success in their efforts to provide social amenities for the staff and congratulated the organisers on the success of the evening.

The whist drive winners were as follows:—

Ladies—1st, Miss Lambert; 2nd, Miss Feakes.
Gents—1st, Mr. Yeadon; 2nd, Mr. Lowe.
Sealed Number Prizes—Miss Wordsworth and Mr. Tate.

Dancing proceeded with such undiminished gaiety that insistent demands were made for an extension, and the hotel management kindly allowed us to carry on until 1.30 a.m.

The same evening a Whist Drive and Dance, organised by the Otley Exchange staff under the able leadership of Miss Trenham, was held at the Liberal Club, Otley. The affair was exceedingly bright and jolly. All branches of the Post Office in Otley and the neighbouring towns sent their contingents, and the 100 or so members of the staff and their friends who were present all entered completely into the spirit of the occasion.

The whist prizes were presented by Mr. Sims (Postmaster, Otley) and Mrs. Sims. Financially the function was also very successful, and as a result Miss Trenham has been able to send a donation of £3 3*s.* 0*d.* to the Leeds Infirmary.

The staff of the Bradford Telephone Exchange held a very successful Dance at the Mayfair Ballroom, Bradford, on Jan. 22. The new Head Postmaster, Mr. P. Ferguson, was present during the evening, and in a happy speech expressed his pleasure at the opportunity of meeting so many telephonists face to face as it were, for, as he explained, he had until that evening been more familiar with the backs of their heads. All enjoyed themselves, and the next dance is already being looked forward to with keen anticipation.

The fifth (revived) Annual Dinner and Social Gathering of the Surveying Branch was held at The Mansion, Roundhay Park, on Feb. 8. Over 40 past and present members of the Leeds Surveying Branch attended, and the party included Lt.-Col. A. A. Jayne, D.S.O., O.B.E., M.C. (Postmaster-Surveyor), Mr. J. Bownass (Assistant-Postmaster), and Mr. W. H. Ayrton (Chief Supt. Postal). Mr. J. F. Hunter (Supt. of the Branch) filled the position of chairman in his usual able manner. The catering gave every satisfaction, and the musical items which followed the dinner were of a high order.

Sports Items.—Leeds Post Office Football Club.—In the 1st round of the Lancs and Yorks Football Cup, the team played Bradford P.O. at Roundhay (home ground) on Jan. 29. The visitors won the toss and played with the wind. The first half showed the Bradfordians as the better players, but in the second half the Loiners did very well to make up for lost opportunities. Ten minutes from time, however, when the score was two all, the Leeds centre-forward failed to take the honours for the day by missing a penalty. Result 2—2. In the replay at Bradford the Leeds team had matters better in hand and the result was decisive. Bradford nil, Leeds 2 goals. The second round is at Leeds versus colleagues from Doncaster.

Leeds P.O. Ladies' Swimming Club.—Arrangements are well in hand for the 1930 season. The Club, which is open to all members of the Leeds Civil Service, will have the Meanwood Road Baths reserved for them on Wednesday evenings (8.0 p.m.), commencing on April 23. Season ticket (includes admission to baths), 4*s.* Applications for membership should be made to Mr. S. Burras (Staff), Head Post Office, Leeds.

Leeds Civil Service Golfing Society.—The Golfing Society was successfully inaugurated at a meeting held at the Griffin Hotel, Leeds, on Jan. 20. Representatives of all branches of the Civil Service were present, and under the chairmanship of Col. T. P. Hobbins, C.B.E. (Surveyor, North Eastern District), who was elected the first President of the Society, the constitution was framed with the completeness which one would expect from a body so well versed in the interpretation of rules and regulations.

The smoker which followed disclosed an amount of talent which promises well for the successful negotiation of the 19th hole. Mr. Bownass (Assistant-Postmaster, Leeds), whose stories were a feature of the "Smoker," was appointed joint auditor to the Society. Mr. C. Tisdall (Postal) is the Post Office representative on the Committee, and all intending members should get in touch with him.

The objects of the Society include an annual competition for which each Department may enter as many players as desired, the trophy to be won by the Department returning the four net scores giving the lowest aggregate. An annual social function is also envisaged and, at a later stage, team matches between the various Departments may also be promoted.

Obituary.—We regret to announce the death, on Feb. 14, of Mrs. Waite, at the age of 73, who has held the position of caretaker-operator at Guiseley Exchange for the past 30 years. Mrs. Waite was one of the oldest caretakers in the West Yorks District, and as such had seen many changes in the telephone system. Her death has occurred on the eve of one of the most important changes in the history of the Guiseley Exchange, namely, the forthcoming transfer to C.B. working. During her long career she gained and held the esteem of the Guiseley subscribers, and there is no record that any one of them has ever made a complaint regarding the service which she gave.

LONDON ENGINEERING DISTRICT NOTES.

THE outstanding event during the month of February in the London Engineering District was the opening of Primrose Automatic Exchange with approximately 4,000 subscribers' lines transferred from the old manual exchange. Approximately 700 new junctions were provided for the traffic to and from distant areas. The old exchange will be reconditioned before being commissioned as "Cunningham." The transfer was effected with that high standard of efficiency which is now considered normal for transfers in the London Engineering District.

The actual transfer is, of course, but the conclusion of twelve months or more intensive work and organisation, on external as well as internal plant. During the Primrose transfer, as in the preceding 22 Director Exchange transfers, no mishap even of comparatively trivial importance, occurred. One important and increasingly complex aspect of a Director Exchange opening is to ensure that at the moment of transfer the new exchange is linked with the whole of the London network. This involves simultaneous switching at all existing automatic exchanges and the provision of facilities for routing indirect traffic via Tandem to the new exchange, often via new routes. The success attending the transfers already made justify the detailed organisation by which it is secured, and which, as an instrument of effective control and co-ordination, is constantly under review.

A summary of the automatic exchanges at present existing in the London Telephone area may be of interest:—

Total number of Director Exchanges	20
Satellites on Director Exchanges ... ... (Hendon on Maida Vale.) (Edgware on Maida Vale.)	2
Tandem Exchange	1
Non-Director Exchange (Epsom)	1
Hypothetical Exchanges working on Director Equipments ... ... (Mansion House on Monument and Colindale on Hendon.)	2

The twenty Director Exchanges may be divided as shown below:—

A.T.M.	*Siemens.*	*S.T. & C. Co.*	*Peel Connor.*
Holborn	Western	Sloane	Archway
Bishopsgate	Peckham	Bermondsey	Reliance
Monument	Maida Vale	Welbeck	Flaxman
Metropolitan	Mitcham	Temple Bar	
National	Ilford	Fulham	
Hillside			
Primrose			

The number of *lines* joined up to automatic exchanges is at the moment of writing approximately 75,000 as compared with the number of manual *lines* of, say, 310,000.

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THE

Telegraph and Telephone Journal.

VOL. XVI. APRIL, 1930. No. 181.

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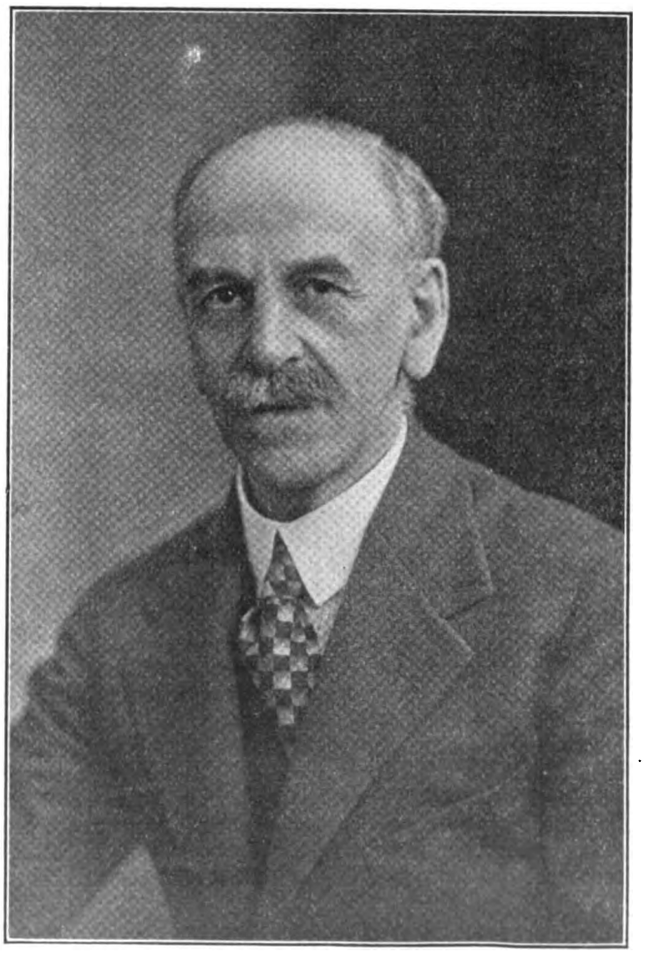
All correspondence relating to advertisements should be addressed to MESSRS. SELLS, LTD., 168, *Fleet Street, London, E.C.*4.

TELEGRAPH AND TELEPHONE MEN AND WOMEN.

LXXIV.

MR. C. H. MANSELL.



THE subject of our portrait and biographical sketch this month is Mr. C. H. Mansell, the Chief Superintendent of Telegraphs at Leeds. Mr. Mansell was born at Glasgow on April 20, 1873, entered the Post Office service in that city in 1889, and became an S.C. & T. in 1889. He reached the position of Overseer in 1915 and went to Plymouth as Assistant Superintendent of Telegraphs in 1916. After promotion to the position of Superintendent at Plymouth in 1921, he was advanced to his present post of Chief Superintendent, Telegraphs (Leeds) in 1925. Mr. Mansell was a member of the Scottish Racing Staff for many years, and thus became well known to telegraph colleagues all over Scotland. His particular bent is towards the technical side of telegraphy, and he has been closely associated with all modern technical developments.

While his sedentary hobbies are literature, music, and chess, his outdoor pursuits are concentrated on motoring, of which he is no mean exponent, as is evident when one endeavours to overtake him on the road.

It is interesting to note that Mr. Mansell's mother was one of the first telegraph operators in the Kingdom, and was the first Matron of the Telegraph School in Moorgate Street (the old T.S.). She was subsequently promoted to Glasgow to take up a similar post.

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MANCHESTER AUTOMATIC TELEPHONES AND THE ENCOURAGEMENT OF HOME INDUSTRIES.

THE whole of the equipment has been manufactured in Great Britain by British labour, and the bulk of it has been made in Lancashire. This has only been made possible by the policy consistently pursued by the Post Office over a long series of years in the encouragement of a home industry which has now become one of the important private industries in this country with a substantial export business. About 30 years ago the Post Office commenced the task of extending the telephone service in London, partly in competition and partly in co-operation with the National Telephone Company. Prior to that time the bulk of telephone apparatus was purchased in America and Sweden, and the equipment for the then comparatively new and up-to-date Common Battery Telephone system was exclusively obtainable from the Western Electric Company of America. At the outset the Post Office had to import its equipment, but as a result of pressure to foster home industries, the American Company was induced to establish a factory at Woolwich, so that supplies might be made by British labour, and as far as possible from British materials. At the same time British firms were encouraged to undertake this work, and among the pioneers was a local firm, British Insulated Cables, Ltd. At their instrument works in Helsby, and later, Liverpool, was manufactured the Post Office trunk exchange equipment for London, Manchester, Cardiff, Newcastle, and Birmingham.

This policy of encouraging national industry has been consistently followed by the Post Office ever since, and at the present time exchange equipment is being manufactured and installed by five important companies in this country, viz. :—

Standard Telephones & Cables, Ltd.	Southall.
Siemens Bros. & Co., Ltd.	Woolwich.
The Automatic Telephone Manufacturing Co. ...	Liverpool.
The General Electric Co.	Coventry.
Ericsson Telephones, Ltd.	Beeston.

In addition telephone apparatus is obtained from other British companies which have been established, while very large supplies of cables and other line plant are also obtained from British companies. Lancashire gets a good share of the orders for this subsidiary plant. Underground cables are obtained from W. T. Glover & Co., Ltd., of Trafford Park, Connolly (Blackley) Ltd., and from the British Insulated Cables Ltd., of Prescot ; overhead wire from Messrs. Frederick Smith & Sons of Salford ; and loading coils for improving the speech transmission of underground cables from Salford Electrical Instruments Ltd. Accumulators and dynamos are also obtained in the Manchester district. Manufactured cotton plays an important part in the make-up of telephone cables and equipment, as well as steel, glass, ebonite, nickel-silver, brass, rubber, copper, and silk. It has been estimated that the raw materials before reaching the telephone construction industry have already provided employment for 20,000 workers in this country.

It was a Lancashire firm which introduced the Strowger system of automatic telephony into Great Britain, and, incidentally, laid the foundation of an industry which, fostered by the Post Office, to-day finds employment for upwards of 16,000 persons in the production of telephones and exchange apparatus. After exhaustive trials the Strowger automatic telephone system was adopted by the Post Office for London and the provinces. Having regard to its county of origin, it is appropriate that the contract for the equipment of the main automatic telephone exchange in Manchester, at Telephone House, should have been allotted to the Automatic Telephone Manufacturing Co., Ltd., Liverpool, the value of the contract being upwards of £400,000. The other Strowger automatic exchanges in the Manchester area are being equipped respectively as follows :—Ardwick by Siemens Brothers & Co., Ltd. ; Collyhurst by Standard Telephones & Cables, Ltd. ; Moss Side by General Electric Co. These firms, together with Ericsson Telephones, Ltd. manufacture Strowger Automatic telephone equipment under licence from the Automatic Telephone Manufacturing Co., Ltd., an agreement having been entered into for the pooling of essential patents, whereby the resources of the entire industry are placed at the disposal of the State, and there is no question of a monopoly in the manufacturing field. By a recent agreement with these firms the Post Office has laid down a programme of telephone construction for a number of years. As a result the contractors have been able to organise their works with the prospect of regular work assured, and the Post Office has reaped the advantage of a considerable reduction in the price of apparatus.

The telephone manufacturing companies not only cater for the Home market, but the main organisations which have been built up largely as a result of encouragement by the Post Office administration, are able to do a thriving export business. It is estimated that only half of the production of telephonic apparatus by the five firms mentioned is used in this country and the other half is exported. When it is remembered that the telephone manufacturing industry, with its supplies and auxiliary services, employs about 100,000 persons, the significance of the fact that half of the product is exported cannot be overlooked in these days when unemployment is widespread.

There is a further benefit, although an indirect and unexpected one, which has accrued from this State encouragement of the telephone industry. The moralists may not approve, but thanks to the ingenuity and flexibility of Strowger Automatic exchange apparatus, it has been possible to adapt it to the requirements of totalisator working, and two of the firms previously mentioned, Automatic Telephone Manufacturing Co., Ltd., and Ericsson Telephones, Ltd., are supplying such equipment to the British Racecourse Betting Control Board. It is probable that the successful functioning of this equipment will result in another outlet for British products overseas. Another application of Strowger Automatic switches (this time quite free from any moral reproach) is for the selective supervisory control of power sub-stations from a central control point, and good foreign business has already resulted. Both these adaptations may justly be said to have sprung from State encouragement of a British telephone industry.

The matter of an augmented export business is all-important ; without the home demand it would have been impossible for British manufacturers to have competed in the world's markets for telephone material, and from negligible figures in 1911, British exports of telephones and associated equipment now rank in a class apart and appear independently in the official returns of the country's foreign trade. One firm alone exported upwards of £500,000 worth of telephone equipment during the past twelve months, and that in direct competition with American and Continental suppliers.

In any review of the telephone industry the production of cable and line equipment must not be overlooked. Under private enterprise most of the telephone circuits of the country were above ground, and the demand for underground telephone cable was negligible. The consistent policy of the Post Office in putting all circuits, as far as practicable, underground, has encouraged the design and development of multi-core air-space cables, many thousands of miles of which have been manufactured and laid by British cable makers.

In the matter of research and development, too, the Post Office, in addition to first-hand activity on a considerable scale in its own laboratories, has consistently encouraged British manufacturers to keep abreast of American and Continental progress, and the fact that we are to-day able to speak literally "around the world," is due primarily to the genius of a British scientist, Dr. Fleming, who invented the thermionic valve, and secondarily in no small measure to the support and encouragement given by the Department to firms interested in the advancement of the science of communications.

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THE TELEPRINTER.

A. P. OGILVIE (*Headquarters Traffic Section*).

(*Continued from page* 112.)

(V.)

Circuit Connexions.—The internal connexions of the Teleprinter are shown in Fig. 15. They provide for (*a*) alternate sending and receiving, or (*b*) simultaneous transmission and reception by means of a cam-operated switch (ST) and a link which may be opened or closed. With the link open the switch is brought into circuit for up and down working (*a*); when the link is closed the switch is short circuited for duplex conditions (*b*).

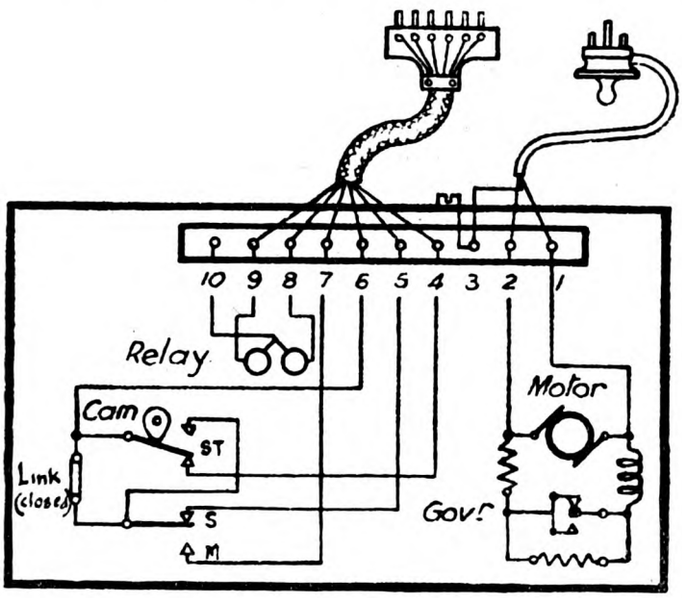

FIG. 15.

The operation of the switch is simple. The cam holds the switch-lever against the lower contact and maintains a connexion between the line and the Creed relay for reception when the local transmitter is idle. As soon, however, as a key is depressed the cam, being fitted on the transmitter spindle, revolves and allows the switch to rise against the upper contact, thereby connecting the transmitter tongue to line. This connexion is maintained during the transmission of a letter, but on the completion of the transmitted combination the lever returns to the lower contact. The switch thus acts as a Send-Receive switch with the advantage of being operated automatically. The arrangement is convenient in certain circumstances, but in Post Office practice it is not resorted to, and the link is always kept closed for simultaneous transmission and reception. Fig. 16 shows the actual position of the mechanism on the transmitter unit.

The circuit connexions for duplex Teleprinter working are similar in principle to those adopted for Morse and other differential duplex circuits. One or two details are, however, of interest. Referring to Fig. 17, it will be seen that a tumbler switch is included in the line circuit. This provides a ready means of disconnecting the line when it is desired to test local adjustments, as, with the line disconnected, the operation of the keyboard actuates the local printer, furnishing a record of the signals passed through the artificial circuit. This test is useful in confirming the existence of a suspected fault, but it is not a completely reliable indication, when perfect local signals are recorded, that the transmitting conditions are suitable for actual line working, and when unsatisfactory results with the distant station persist, further tests should be undertaken before local adjustments are accepted as accurate.

A Morse key with switch and a polarised sounder are included on each Teleprinter set to provide a convenient means for refining

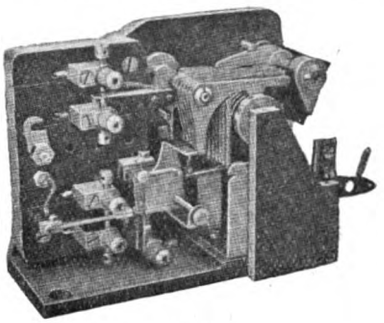

FIG. 16.

the duplex balance and also for use in cases of emergency, the Teleprinter then being withdrawn to provide space for Morse working. The extended use of reserve Teleprinter sets, which are now installed adjacent to working circuits, is modifying the importance of this emergency arrangement.

At small offices a short distance from a large transmitting centre it is usually desirable for maintenance reasons to simplify circuit arrangements as much as possible. Batteries which may require frequent attention, relays and duplex balance equipment, introduce complications liable to cause prolonged stoppages unless skilled personnel is available. To eliminate these items a system of two-line working has been introduced. One line is employed in sending from the Head Office to the Out Office and the other

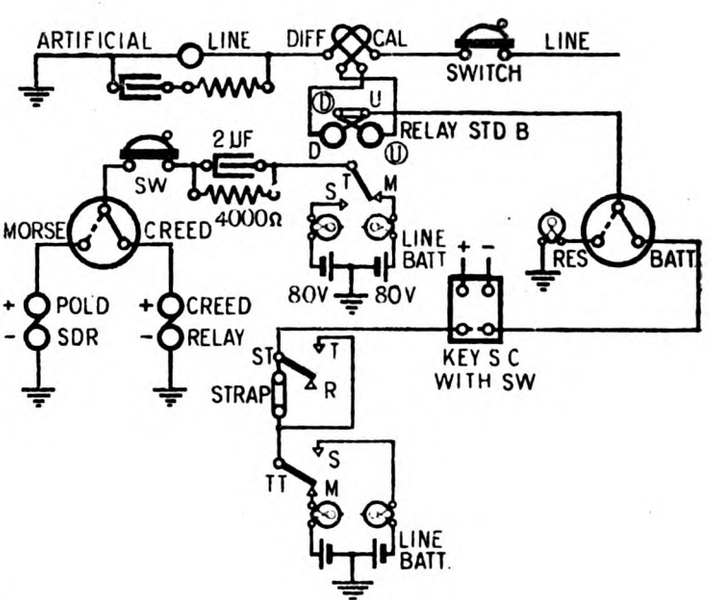

FIG. 17.

line for signalling independently in the reverse direction. Although two lines are in use only one Teleprinter is provided at each office, Line 1 being connected from the transmitter tongue of the machine at the Head Office to the Creed relay of the machine at the Out Office, while Line 2 provides a circuit from the transmitter tongue of the Out Office machine to the Head Office relay which operates the local Teleprinter receiver. A reference to Fig. 18 will show

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that double current signalling direct to the Creed relay is employed on Line 1, and Central Battery single current signalling to a P.O. relay on Line 2. By this means the equivalent of duplex working is possible with a minimum of apparatus at the Out Office.

An interesting feature of the arrangement is the provision of a 6-terminal switch which when turned to "Local" makes it possible for the Out Office to test the local Teleprinter by signalling on Line 2 to the Head Office, thence from the P.O. relay tongue to Line 1 and back through the local Creed relay. At the same time the Head Office Teleprinter transmitter signals are short circuited through the switch through the home Creed relay.

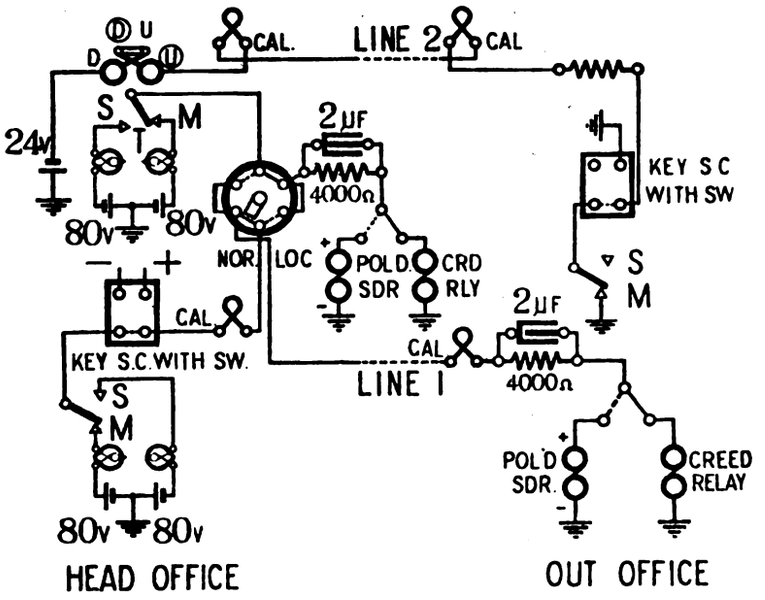

FIG. 18.

Two-line simplex conditions have also been established on the Voice Frequency systems equipped with Teleprinters in operation between London and Manchester, and between London and Glasgow. On each system twelve frequencies, six in each direction are available. By appropriating two frequencies, one for sending and one for receiving, each of the six Teleprinters at the terminal offices are worked as at duplex.

Recent trials of two-line Teleprinter working have also yielded very promising results on "phantom" channels obtained by double superposition on telephone trunk lines between offices over 400 miles apart, and there are reasonable prospects of rapid developments in this direction.

(To be concluded.)

FOR OUR ADVERTISERS.

The following contracts are open and all references should be made, unless otherwise stated, to the Department of Overseas Trade, London, S.W.1: *Australia*, Melbourne, Postmaster-General's Department. April 22. Supply of braided switchboard cable (Ref. B.X. 6201). *Victorian Electricity Commission*. May 12. Supply of 22,000 V-pin type supporting insulators for year 1930-31 (Specification No. 30.12) (Ref. B.X. 6179). *New Zealand*, Wellington, Posts and Telegraphs Department. Supply of Terminal strips (B.X. 6209).

The following information received from the Madrid branch of Reuter's Agency should prove of interest to English manufacturers: "The new Spanish Government has suspended the examination of tenders for the establishment of broadcasting stations throughout the country and also for the supply of radio material. It will be recalled that it had been intended to grant a monopoly for these services.

J. J. T.

SKYSCRAPERS.

THE man employed on the Contract side of the Telephone Service, one of whose duties is to estimate the telephone possibilities of commercial neighbourhoods, is confronted in these days of enterprising and audacious building development with two difficult questions. First, how far is the tendency to erect higher and higher buildings for commercial purposes going to extend? Secondly, is the present type of lofty steel-framed building, the type adopted for new buildings in the City, Kingsway, and Regent Street and Piccadilly, to be regarded as a more or less stabilised type, or is it merely typical of a phase in a forward movement in building and architecture?

In America, the lofty or skyscraper type of building has been exploited to an extent altogether unknown in this country. In London, at the moment, we have no building of a height sufficient to bring it within even measurable distance of the term of skyscraper. That this is so is obvious if we compare two American skyscrapers with some of our high buildings in London. Consider the Woolworth Building in New York. The main portion of this steel-framed building, we are told, comprises 31 storeys and is 400 feet high, while the tower above has an additional 29 storeys, making 60 storeys in all, and bringing the total height from the pavement level to 800 feet. A still loftier building, reported to be in course of erection in Chicago, will have 75 storeys and reach a height of 845 feet above street level, second in height only to the Eiffel Tower. These are impressive figures, almost staggering, indeed, when we reflect that 800 feet represents an elevation well over twice the height of St. Paul's Cathedral.

Compared with such structures our loftiest buildings fade into insignificance. Take four buildings, erected in London in recent years, which have aroused a good deal of public interest—Adelaide House, Vintry House, the new Grosvenor House, and the Royal London Insurance Building in Finsbury Square. Adelaide House, at the City end of London Bridge, attracted attention, partly because of its bold and striking design but largely because of its height, and certainly, viewed from the river or from London Bridge, it gives an impression of great elevation, an impression which is heightened by the fact that the building starts right off the river bank, far below the bridge level, and also by the strong vertical lines of the design. And yet, although many people—stockbrokers and other City men with artistic leanings—shook their heads at it when crossing the Bridge on their way to the City, and asked what we were coming to and where this sort of thing was going to end, Adelaide House is merely a dwarf structure when compared with a New York or Boston skyscraper. A similar remark applies to Vintry House, in Southwark Street, built last year by the Vintners' Company, which, like Adelaide House, has a main frontage on the river. Vintry House, although a 10-storey building, and a high building for London, does not suggest height so much as Adelaide House, due perhaps to the different treatment of the walls and roof. What, indeed, seems to attract more attention at Vintry House than the size and design, impressive though the building is in these respects, is the entrance doorway, quaintly detached from the main building, and carrying some striking decorative features—a carved goddess crowned with vines, two fluted metallic columns with Ionic capitals, and a pair of carved swans, the last item recalling the fact that the Worshipful Vintners, together with the Worshipful Dyers and the Crown, are owners of the swans on the Thames.

The new Grosvenor House in Park Lane, a steep cliff of service flats, does, on the other hand, give an impression of height, due partly to the flat expanse of Hyde Park opposite, and partly to the fact that the neighbouring buildings are all of modest elevation. And yet the whole height of Grosvenor House, from ground floor to roof, is only 100 feet, the towers contributing an additional 20 feet or so. It is a pigmy in comparison with a modern American hotel or block of flats.

The fourth building, the recently completed Head Office building of the Royal London Mutual Insurance Society, in Finsbury-

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Square, is loftier than any of the other three, the high tower crowning the structure reaching a height of 230 feet, which makes it the loftiest commercial building in London. But even this height, as we have seen, is only a quarter of the height of the modern American skyscraper.

It would seem from these facts that the time when London will have business buildings even modestly approaching the American skyscraper type is a long way off. There is, however, a marked tendency to permit the erection of higher and higher buildings in commercial neighbourhoods. In discussing this trend, the advantages of lofty buildings, and the objections to them, American experience of the skyscraper is of considerable value.

A New York architect, in a lecture delivered recently in London, claimed certain advantages for the skyscraper type of building. The steel skyscraper was the safest building possible in the case of fire, storm, or earthquake. There was a reduction in the site cost of a building as the number of floors was increased. There was the economic benefit of concentrating large businesses in one building. The first of these advantages applies, of course, to all steel-framed concrete buildings whether skyscrapers or not. The second is clearly debatable. It raises at once the question whether the increased charges made by landlords for sites on which it was proposed to erect skyscraper buildings would not counterbalance very largely the saving due to the provision of a large number of floors, whether too, the artificial impetus given to the value of such sites would not react against the community in the long run. The third advantage claimed—that the housing of all the component parts of a large industry in a high building erected on a comparatively small superficial area leads to efficiency, in the sense that there results an economy in time occupied in consultation and discussion and reference between departments—makes, however, a strong appeal.

On the debit side comes first the question of sunlight, or rather the absence of it. New York, we are told, is fast becoming a sunless city. The buildings have soared steadily in height but the streets have remained the same width or have not been appreciably widened. We hear a good deal about the "zoning" regulations, regulations which restrict the height and form of buildings according to the part of the city concerned. A new building in a "2½ zone," for example, is allowed a height of two and a half times the width of the street, and greater elevation by a series of steps or shallow set-backs of the upper storeys.* This helps matters in the upper reaches but does not prevent the streets flanked by skyscrapers from becoming, as one writer put it, a series of gloomy canyons, into whose depths the sun never penetrates.

The difficulty of providing fresh air for the rooms in the lower portions of buildings in streets filled with skyscraper structures is another objection. Ingenious methods, we are told, have been devised by American engineers to overcome this objection. Fresh air is pumped into the building from the roof, washed and warmed, and driven to the rooms below as required. It is open to doubt whether air treated in such summary fashion will retain its fresh and health-giving qualities.

Lastly, there is the traffic congestion due to the employment of thousands of people in high buildings covering comparatively small superficial areas. In the Woolworth Building in New York 10,000 people are employed. Plant a few buildings of this capacity in a street, and a point is reached when a population approximating to that of a fair-sized town has to fight its way into it and out of it each day. American business men are emphatic on the point that in New York the congestion of traffic is so great that an enormous amount of time is wasted in getting from one point to another. The conclusion reached is that, although, for a time, there is economic advantage to a large firm, or a group of associated firms, in concentrating in a single building, as soon as the example is followed generally it leads to an uneconomic system of carrying on business so far as the community is concerned.

Building engineers tell us that London clay has not the weight carrying capacity of the rocky sub-soil of New York, that it would not support the massive type of steel-framed building permitted in that City. Quite apart, however, from this consideration, which would seem to shut out the erection of the highest type of skyscraper in London, the verdict seems to be against even the moderate skyscraper, the building which would climb to a height of, say, from 300 to 400 feet.

A well-known architectural authority stated recently that American builders themselves are coming to the conclusion that, on practical grounds, the skyscraper is a failure. It is difficult to discern any very definite trend of expert American opinion in that direction. There does, however, seem a tendency—in New York, at least—to halt and consider whether, after all, aggregation and concentration to the extent reached in these huge structures lead to true economy, whether, after all, the erection of buildings of such abnormal size and height is in the best interests of the community.

C. W. M.

* A good example of "zoning" in London is seen in the recently erected building housing the Bank of London & South America in Tokenhouse Yard, a very narrow thoroughfare near the Bank. Another "zoned" building is the new Devonshire House, in Piccadilly, although here the effect is not so complete, the street being much wider.

THE CONTROL OF IMPERIAL WIRELESS TELEPHONY.

THE Postmaster-General, in answer to Mr. Bowen's question on this subject in the House of Commons on July 26, said:—

"Yes, Sir, the Government has reached a decision and, with the permission of the House, I will state briefly the main reasons for it.

"Under the late Government the Beam wireless system for overseas *telegraphy* was leased to the Imperial and International Communications Company under conditions and circumstances which are well known. The late Government, however, in conformity with the recommendation of the Imperial Wireless and Cable Conference, reserved to the Post Office the control of overseas *telephony* and deliberately refrained from committing themselves on the question whether they would or would not use the Company's stations for this purpose.

In August last I received a letter from the Communications Company urging that the Government should now decide to work overseas telephony through the Company's stations beginning with four services to Canada, Australia, South Africa, and India. This was one alternative. The other was to concentrate all their wireless telephone services at the Government station at Rugby which has for three years worked the service to the United States on a commercial basis. In deciding between these two alternatives there were two main issues. Firstly, which of the two systems would provide the most efficient service, and, secondly, which would be the more economical. As the first question involved highly technical considerations, the Government decided to consult two independent experts of acknowledged repute who have no connexion with the Post Office, Professor G. W. Howe, Professor of Electrical Engineering at the University of Glasgow, and Dr. F. E. Smith, Secretary of the Royal Society and of the Department of Scientific Research. They reported that apart from future developments both systems are probably equally capable of providing satisfactory telephonic communication between two points for a given number of hours a day, and that, as regards future development, the Rugby system was the more elastic, and therefore in this respect offered decided advantages.

The second main issue is the financial comparison between the two systems. Concentration at Rugby admits of economies in many directions, and, in particular, in the land-line connexions to the London Trunk Exchange. A wireless service requires costly land-line connexions between the London Trunk Exchange and the wireless stations. By grouping of services at one centre, such as Rugby, a smaller number of lines will suffice and the distance of Rugby and Baldock from London is much less than the distance of the Beam stations at Bodmin, Bridgwater, Grimsby, and Skegness. The result is that to work the four services to India and the Dominions through the Beam stations would need 4,190 miles of high grade telephone circuit, while to work them through Rugby and Baldock only 786 miles would be required.

The minimum rental asked by the Company for the use of the Beam telegraph stations for the telephone services in question is (excluding a cheaper scheme which is open to objection on other grounds) £40,000 to £45,000 per annum, according to the type of equipment employed, plus a royalty of 10% on the gross receipts in excess of a certain figure. A detailed estimate of the cost of working the same services from Rugby shows a saving on the above figures of £17,000 per annum and £22,000 per annum respectively, which would be increased when the royalty commenced to operate.

The Government has had to weigh the pros and cons of a number of other questions which cannot be compressed into a Parliamentary answer. As a result of their consideration of all the issues they have decided upon a policy of conducting overseas wireless telephony by concentration at the Post Office station at Rugby with its receiving station at Baldock.

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TELEGRAPHIC MEMORABILIA.

THE open debate arranged by the Post Office Telephone and Telegraph Society at the Institution of Electrical Engineers on the 17th ult. was a well-attended gathering. Under the genial chairmanship of Mr. F. W. Phillips, no one could complain of undue constraint either as regards the time occupied, manner of expression or method of dealing with that very live subject "How to Improve the Telegraphs," introduced by Mr. L. Simon, who was a very clear exponent of what, perhaps, may be termed the Departmental aspect. The result was rather a destructive than a constructive one, unless one takes the view that it is necessary to pull down before re-building can possibly commence. From the various cross-currents not only of differences of opinion, but at times differences even as to the facts, there would appear to have emerged the opinion that, (*a*) the Telegraph Service has seen its best days; (*b*) There is no real criticism of the service apart from Press stunts; (*c*) There is considerable avoidable delay; (*d*) There is normally no avoidable delay in the telegraph offices; (*e*) There is delay inside the offices, at the counter, for example; (*f*) The "walk" system of delivery is fatal to fair and expeditious delivery; (*g*) The staff cannot work up any real enthusiasm for a dying industry which offers no prospects; (*h*) The service is not dying, it only needs the closer attention of the engineers; (*i*) If the engineers had left well alone a few years ago there would have been less trouble to-day. There were also other points that emerged but my space has already been overstepped.

Power from the Mains!—Owners of radio receivers who contemplate utilising the local power supply for their sets, and perhaps those who have already installed the necessary apparatus for that purpose, may wish to see what has happened in the Burnley district. It is estimated that out of the 8,000 licenceholders in that district, no less than half this number have equipped their sets with battery eliminators for the present d.c. supply. The Corporation's Electricity Department is about to change over to an a.c. distribution, and four thousand odd licensees are annoyed, to put it mildly. The Mayor is reported to have stated that the Corporation was not consulted when the sets were installed, and it is therefore very unreasonable to attempt to make it responsible for the 4,000 soon to be useless eliminators. The Engineer is said to maintain that there is no precedent for the compulsory replacement of radio apparatus by electrical supply authorities, while it has been estimated that if the Corporation were to compensate every wireless set user it would cost the Corporation something between £12,000 and £15,000, or the ratepayers the equivalent of a sixpenny rate! There does not appear to have been any further move on the part of the plaintiffs!

Round the World.—AUSTRALIA.—Cable *v.* radio. The Australian Postal Department has under consideration, says *The Electrical Review*, the advisability of establishing a telephone service between Melbourne and Tasmania by a telephone cable crossing Bass Strait, the distance across which is 238 miles. Tenders had actually been invited for a wireless method, but recent developments in submarine cable telephony technique have caused the Department to reconsider its decision. CANADA.—*Telegraph developments.*—The improvement and development of its telegraph system is being planned by the Canadian Pacific Railway Co., and to cost £600,000. Reuter's Agency in Ottawa states that 336,792 broadcast licences were already issued up to the end of January, an increase as compared with the same date as last year of 40,046. This may be accounted for by the fact that a recommendation has been made to increase the licence fee from one dollar (4*s.* 2*d.*) to three. *Canada takes the B.B.C. as its model!* The Government Bill to be presented this session proposes to take control of radio out of the hands of private corporations and to control broadcasting through a national company similar to the British Broadcasting Corporation. Efforts will be made to supplant U.S. programmes with others of Canadian or British character. Seven high-power stations are to be built to serve the nine provinces. The present owners will be compensated, says Reuter's Agency. There are actually 81 broadcasting stations at the present time allotted to newspapers (13), to grain brokers (6), to railways (13), and the remainder to religious and scientific societies, universities, commercial houses, &c., &c. CEYLON.—The report of the Colonial auditor on wireless matters in Ceylon for 1927-28, based on figures supplied by the Postmaster-General up to the end of Dec. 31, 1928, shows that the revenue included a sum of Rs. 11,450, being the value of 1,145 listeners' licences at Rs. 10 each, while 20 dealers' licences at Rs. 30 each, brought in Rs. 600. Customs receipts from wireless goods imported amounted to Rs. 10,609, subscriptions for programmes to Rs. 607, and advertisement in programmes to Rs. 875. The loss on working for the year was Rs. 18,861 states *World Radio*. The chief of the Telegraph Department and his staff, says our informant, have had to face much indifference, and only small funds have been placed at their disposal. The Colombo station is only permitted to broadcast for two to three hours per day! EGYPT.—Several Powers have asked the Egyptian Government for a copy of the law on wireless in Egypt and the Government has replied that no legislation exists at present. A representative of the Marconi Co. has met the Minister of Communications to discuss a scheme for broadcasting in Egypt. *The Electrical Review* also furnishes us with the following novelty in wireless communication, probably unique in its application. The Egyptian State Telegraph Department has ordered from the Marconi Company three wireless sets mounted on motor lorries for use when and where required in areas not normally served by land communication systems. Thus communication will be possible on either bank of the Nile when in flood or otherwise, and this mobile system can thus be linked up at short notice with the main Egyptian telegraph and/or telephone systems. Each lorry carries a 70-ft. portable mast. FRANCE.—*Railway Radio.*—The inauguration of the first public wireless service on French trains took place on Feb. 10 on the Le Havre—Paris route. Telegrams can be sent to and received from the general telegraph system of the country while the train is in motion. GERMANY.—There was an increase of nearly 250,000 wireless licenceholders at the end of 1929 in Germany, the total number reaching the record figures of 3,066,682. The North German Lloyd Co.'s 50,000-ton liners, *Bremen* and *Europa*, spoke to each other by wireless telephone last month over a distance of nearly 2,500 miles when the former was a little way out from New York and the latter was undergoing her trials in the North Sea. Communication between the two vessels was good and passengers in the *Europa* also spoke to subscribers in various parts of Germany. Telegraph communication was also established with the *Colombus* (32,000 tons) which was in the neighbourhood of Bombay. GREAT BRITAIN.—The *Electrician*, in a leaderette, thus congratulates the Post Office: "It is much to the credit of the Post Office engineers and of the International Marine Radio Co., that a telephonic communication with the *Majestic* has been achieved so soon after the experimental success obtained with the *Olympic*. It is true that preliminary experiments have been carried out for a number of years, but the difficulty of separating the incoming and outgoing waves on the ship has only been overcome quite lately." A Post Office service of Picture Telegraphy was opened between Great Britain and Denmark on Feb. 20. It is also announced in the technical Press that the Television Society of Great Britain will open the second annual exhibition of television and other kindred apparatus at University College, London, on the 9th of this month. *Licences.*—The Earl of Clarendon recently stated that the steady growth of receipts of the B.B.C. showed that the British public enjoyed the Corporation's programmes. There were 3,000,000 licensed listeners, of which 328,344 were new licenceholders during the year ended 1929. In connexion with this statement, and in any case in connexion with the very satisfactory percentage increase quoted above, it is reported that as the result of a tour in the Manchester district, so it is understood, during the month of January of a Post Office wireless detector van, the function of which is to locate receiving sets that are operated without licences, no less than four thousand new licences were purchased within that particular area—nearly 130 per day! GREECE.—An agreement with Marconi's Wireless

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Telegraph Co. granting the company exclusive rights for broadcasting in Greece, is, as we write, before the Greek Chamber by the Minister of Communications. IRISH FREE STATE.—*Training of Maritime Wireless Operators.*—The Dublin Technical Schools have been furnished with a completely new wireless telegraph installation, consisting of two new transmitters and direction-finding apparatus, 1929 models in all cases. The Ministry of Posts and Telegraphs is alone entitled to certify the efficiency of students. INDIA.—As foreshadowed in last month's *T. & T. Journal*, the Indian Broadcasting Company has been voluntarily wound up, and the Government of India has decided to take over the concern from the liquidators. The purchase price, according to *The Times*, is somewhere in the neighbourhood of £22,500. It is proposed to establish a board of control, which will probably comprise eight members, four official members, including the Government member concerned, who will be chairman, two non-official members from Bombay, and two non-official members from Calcutta. There will also be a secretary and a financial adviser. Reuter's Agency reports that the Standing Committee of Assembly approved the Government's proposal to acquire the company for a period of two years. The annual recurring expenditure is estimated at 67,000 rupees, with a net charge against revenue of 41,000 rupees. The Finance Committee agreed to the proposal, subject to the condition that the Government shall do its best to secure the advantage of the latest experience in countries where broadcasting has been a success and that steps be taken to so train Indians that the business will eventually pass into Indian hands. The Government proposes to appoint in the summer of 1931 a representative committee, to examine the position with regard to the taking over of broadcasting and prospects generally, as experience would by then have been gained of the success of the service under Government management. LATVIA.—The Riga radio-telephone broadcasting station (3 k.w. 572 k c/s, 565 m.), says *The Electrical Review*, has warned listeners that its wavelength is being used by the Russian Soviet station at Smolensk (2 k.w. 531 k c/s, 565 m.) for the dissemination of, it is alleged, communistic speeches against the Latvian Government. LUXEMBURG.—A curious report, so it would appear, comes from *World-Radio*, to the effect that a new law has been made in the Grand Duchy which permits the erection of privately-owned wireless *transmitters* as well as those State-owned. It is said that "no control is exercised over them, but certain conditions are imposed for the granting of the special concession from the Postal-Telegraph Authorities, which is necessary." If conditions are *imposed*, one would think that this would infer some sort of control anyway! SWITZERLAND.—Though a small country the Swiss government is compelled to arrange for bi-lingual broadcasting. Thus the new higher-powered station at Sottens, near Moudon, will have an aerial power of 25 kw., and is the main transmitter for French-speaking Switzerland, that at Beromünster (canton of Lucerne), will have an aerial power of 60 kw., and is for German-speaking Switzerland. It is expected that they will be completed in the current year. U.S.A.—Station KDKA of the Westinghouse Electric & Manufacturing Co. will have at its new transmitter, near Saxonburg, Pennsylvania, says *The Electrical Review*, an antenna which is expected to overcome one of the major obstacles to high-power broadcasting. The antenna is said to be so designed that it will not "blanket" the surrounding territory, yet it will send out powerful signals to distant points. The American Telegraph & Telephone Co. announces that a wireless-telephone service between New York and Warsaw was opened on Feb. 1. On Mar. 13 Reuter's agency in New York reported that "While the White Star liner *Majestic* was passing the Statue of Liberty in the upper harbour, the wireless operator held a direct conversation with the officer on duty at the G.P.O. in London." The operator stated that this was the first time that such a conversation had been held so close to New York. Mr. Walter S. Gifford, president of the American Telephone & Telegraph Co., is reported to have informed the Inter-State Commerce Committee that a transatlantic telephone cable would be ready for use in 1931. The cost, it was estimated, would figure out between £2,000,000 and £3,000,000. In the meantime the present transatlantic wireless service with its several wavelengths is working practically throughout the 24 hours of the day, serving as it does at present the whole of Europe and America.

Personal.—It is with regret that we learn through *The Electrical Review* of the death of Mr. Walter Judd, M.I.E.E., late of the Eastern Extension, Australasia & China Telegraph Co., Ltd., on Feb. 20, in his 78th year. *The Times* reports that Mr. Henry William Brookman, formerly Superintendent of the C.T.O., G.P.O. West, died on the 26th of the same month in his 92nd year. Mr. Brookman entered the service of the Magnetic Company as an operator after the Great Exhibition of 1851; he was transferred to the Government service in 1870, when the undertaking was purchased by the State. Mr. Brookman rose through all the various grades to the rank of Superintendent in 1895, and retired in 1902.

The death of Mr. T. Griffith, formerly of the late Submarine Telegraph Co., who transferred to the Post Office Telegraph Service when the company was taken over by the Government in 1889, is also announced. Mr. Griffith was an overseer when he retired from the Service upon reaching the age-limit many years ago, and was one of an entire family the male members of which had chosen telegraphy as their vocation.

It is understood that Commander F. G. Loring, whose place as Inspector of Wireless Telegraphy to the G.P.O. has recently been taken by Lt.-Col. C. G. G. Crawley, has taken up a position with the International Marine Radio Co., Ltd.

Laughter.—The most utterly lost of all days is that in which you have not laughed!—*Anon.* J. J. T.

REVIEWS.

"Telegraphy, a detailed exposition of the Telegraph System of the British Post Office," by T. E. Herbert, M.I.E.E., is actually the fifth edition of *Herbert's Telegraphy*, as known by Post Office officials. Published by Sir Isaac Pitman & Sons Ltd.; the production of this volume of 1,200 pages is well up to the highest standard of the printer's art for this type of book, with its 750 clear-cut illustrations, and its bold, well-leaded paragraphs.

Of Mr. Herbert's revision, one may say at once, it is thorough in all respects. The new illustrations are over three hundred in number, and the entire early matter has been overhauled and where necessary extended, for example, a fuller treatment of "the magnetisation of iron" will be noted. The Mendoça governor, now actually on trial in connexion with Baudot working in the British Post Office, is exhaustively dealt with, and the references to Regenerative repeaters, the Teleprinter, the Creed products, are well up to date, as are also those on "Voice-frequency" and "Sub-audiotelegraphy," &c. The price of this volume is £1, but no earnest student would grudge this sum for information so extensive and so reliable.

The author was no doubt well-advised in not attempting to add a chapter on Picture Telegraphy. To have done justice to this latter subject could not but have meant delay of the publication of the present edition (itself actually issued on Feb. 24) until too late for next autumn's classes, besides which Picture Telegraphy did not become a regular public Post Office service until the beginning of the present year.

On a point of fact one may be permitted to add, p. 514, that the London—Rome telegraph circuit, for some considerable time, has been worked on two channels of a split quadruple simplex Baudot in place of the Hughes system.

J. J. T.

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EXTRACTS FROM TELEPHONE SERVICE REPORTS.

MANCHESTER.

Telephone Progress.—During the year ended Dec. 31, 1929, the number of telephones increased from 87,390 to 91,968, a growth of 4,578, or 5.2%. The number of new telephones fitted was 9,436, and the cessations 4,858.

The number of telephones has increased from 32,946 in September, 1912, to 90,565 in September, 1929, a growth of 57,619, or 175%, in 17 years.

Since July, 1929, the minimum telephone rental has covered a radial distance of two miles from the exchange instead of 1½ miles. This represents a reduction of £2 per annum for subscribers over 1½ miles from the exchange. In making comparisons with Continental charges, it is interesting to observe that in Sweden, for example, when an exchange is established in a rural area, the subscribers are required to construct their own lines or to pay the telephone administration for doing so. When the system grows to 50 lines the installation is taken over by the telephone administration, with the exception of lines outside a radius of 500 metres. In this country the rental includes the installation of the lines, as well as the apparatus, a principle which is common to all electricity supply undertakers.

The expansion of the telephone services is mainly dependent upon the prosperity of the community at large, and in times of financial stress, or trade depression, there is a tendency for telephone development to slow down. It is not surprising, therefore, to observe that the growth of the telephone service in recent years has not been so great as might have been anticipated under more prosperous conditions. The telephone, however, has come to be recognised generally as an essential tool in the efficient management of business undertakings, as well as for the service of household and social requirements, and it is the earnest desire of the Post Office Administration to make it as useful and helpful as possible. The suggestions and criticisms of the Chamber of Commerce have been of much value to us in this respect.

Telephone Traffic.—During the year ended Dec. 31, 1929, effective trunk calls and telegrams totalled 6,685,426, which represents an increase of 203,292 over last year's figures. Local calls for the twelve months numbered approximately 70,250,000, against 66,000,000 for 1928.

Service.—The average speed of answer was approximately 5.9 seconds, against 5.8 seconds last year. The increase is due to figures of over 6 seconds being obtained during the period February to May, when the staff was seriously depleted owing to the influenza epidemic.

Written complaints average one per 28,000 telephone calls. The figure of one per 41,000 for 1928 was mainly due to an exceptionally low number of plant complaints during the six summer months of that year.

Automatic Telephones.—The new building, Telephone House, Chapel Street, is now occupied by the District Manager and his Accounting, Traffic and Contract staffs.

Rapid progress is being made in the installation of the advance manual switchboard and the necessary automatic apparatus. The equipment is of the very latest type and Manchester has the benefit of the experience gained in London. Early in 1930 the first director automatic exchanges in the Manchester scheme will be opened at Ardwick, Collyhurst and Moss Side, together with a portion of the new manual Toll Exchange in Telephone House, which will work in conjunction with these. The major portion of the plant for these exchanges is already installed and testing and tuning up in readiness for transfer is now in process.

A director demonstration unit is being installed in a room adjoining the Public Office at the Head Post Office, Spring Gardens. It will be ready early in March and is for the purpose of demonstrating the method of making and receiving telephone calls under automatic conditions to subscribers, particularly those connected to the Ardwick, Collyhurst and Moss Side Exchanges, whose installations are to be converted and to members of the public generally.

Preparations have made good progress during the year for the further gradual transfer to automatic working of other exchanges. New buildings for the accommodation of automatic plant are now ready at Heaton Moor and in varying stages of erection at Oldham, Ashton, Gatley, Woodley and Longford. Good progress has been made with the building for housing the new automatic exchange at Stockport.

WEST YORKSHIRE DISTRICT.

During the year ended Dec. 31, 1929, a steady increase in the number of lines and stations has been maintained.

The figures are as follows :—

	Lines.	*Stations.*
At Dec. 31, 1928	42,674	65,540
Added during 1929	4,335	6,877
Cessations during 1929 ...	2,738	4,105
At Dec. 31, 1929	44,271	68,312
Increase on 1928—		
Lines	1,597 or 3.7%	
Stations	2,772 or 4.2%.	

It is interesting to note that, of the orders for new telephones added during 1929, 44% were executed within one week of receipt by the Engineering Department and 70% within two weeks ; in many of the remaining cases the circumstances which prevented earlier completion were not within the control of the Post Office.

The distribution of "Lines" and "Stations" between automatic and manual exchanges at the end of each of the two years was as follows :—

Date.	*Lines.*		*Stations.*	
	Auto %	*Manual.* %	*Auto* %	*Manual.* %
Dec. 31, 1928 ...	41.5	58.5	42.5	57.7
Dec. 31, 1929 ...	41.8	58.2	42.6	57.4

Telephone Calls Effected during the Year.—

Trunk calls	6,131,028
Local and junction calls ...	41,679,862

New Exchanges and Premises &c.—Progress has been made throughout the district in the provision of new exchanges and the substitution of modern plant for the older types of equipment.

The following is a summary of work done and projected :—

	Automatic Exchanges.	*Manual Exchanges.*
Opened during 1929 ...	*Lothersdale.	Horbury. Huby. Gargrave.
In progress or projected ...	*Addingham. *Adel. Bolton Abbey. *Denholme. Horsforth. *Horton Green. *Hunslet. *Laisterdyke. *Manningham. *Oakwood. *Queensbury. *Undercliffe.	Guiseley. Hebden Bridge. Kirkburton. Ossett. Rawdon.

* Additional exchange.

The opening of the automatic exchange at Lothersdale is of special interest, as being the first example in this district of the policy of establishing automatic exchanges in rural areas. Until recently, manual exchanges only were installed in such areas, but automatic equipment has now been designed on a basis which promises favourable economic results. The minimum exchange unit provides for 25 lines, and further units can be added up to a maximum of 200 lines. They are accommodated in simple extensible buildings of the "garage" type and are left unattended. A maintenance man normally visits them about once a week for the purpose of attending to the power plant and making a general maintenance inspection. One important advantage of these small automatic exchanges is that they provide an all-night service, both locally and to the outer world via junction lines to the nearest "parent" exchange, whereas the expense of providing night attendance at the village exchanges of the manual type is frequently prohibitive.

The new exchanges at Bolton Abbey and Denholme will be similar to the Lothersdale Exchange.

BIRMINGHAM DISTRICT.

New buildings for the accommodation of automatic exchanges at Harborne, Northern, and Victoria are now completed. Sites have now been acquired at Acocks Green, Blackheath, Great Barr, Halesowen, Oldbury, Priory, Selly Oak, and Tipton.

Negotiations are in progress for the acquisition of sites for new exchanges at Birchfields, Charlemont, Four Oaks, Kings Heath, Quinton, Sheldon, Walmley, and Warstock.

The transfer of over 800 lines from Central to Midland was carried out in May last in conjunction with the issue of the May Directory. Arrangements were carried out at the same time to provide subscribers at several exchanges in the Birmingham area with four-digit telephone numbers as a preliminary to the introduction of the Director Automatic System. Additional exchanges are under consideration and at an opportune time the necessary changes will be effected.

Wolverhampton.

A considerable amount of preliminary work has been done in connexion with the conversion to automatic working in this area which will include he following exchanges :—

Wolverhampton, Bilston, Fallings Park, Finchfield, Tettenhall.

Sites have been acquired and the buildings will be commenced during the year with the exception of Bilston which has been completed.

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Walsall.

The conversion of Walsall, Bloxwich, and Aldridge Exchanges to automatic working was carried out on May 4 last. The new automatic plant is of the Strowger type. There is no manual equipment at Bloxwich or Aldridge, and all calls from these places which necessitate manual operation are extended automatically to the new switchboard at Walsall.

Dudley.

The new type of automatic equipment to replace the existing apparatus at Dudley is nearing completion. The provision of automatic apparatus at Brierley Hill, Cradley Heath, and Stourbridge is also approaching completion and it is expected that within two months the last three exchanges will be working on a common system with Dudley.

The growth in telephone stations continues and now totals 73,627, which is an increase of 7.74% during the year.

The subjoined table shows the increase during each of the last six years :—

Year.	*Total at Close of Year.*	*Percentage Increase for Year.*
1924	47,332	13.23
1925	52,704	11.35
1926	57,919	9.89
1927	62,937	8.66
1928	68,333	8.57
1929	73,627	7.74

Calls.—In the local exchanges 58,552,174 calls, including short distance trunk calls, were originated in the district during the year. This constituted an increase over the previous year of 2,490,497, while the long distance calls controlled at the Trunk Exchange increased from 4,086,950 to 4,413,924.

THE G.P.O. PLAYERS.

THE G.P.O. Players excelled themselves in " The Way Things Happen," by Clemence Dane, which they gave at King George's Hall, Caroline Street, on Feb. 27 and 28 and March 1. The performance was the more creditable in that the character of Martin Farrer is not only difficult to portray in itself, but is a source of difficulty to the characters who share the stage with him. Self-centred people are, unhappily, not altogether rare, but there was a kind of exasperating denseness about Martin's selfishness which it required much skill to make convincing. Mr. Gartland handled this exacting part with the greatest credit to himself, and Miss Ursula Hicks (a newcomer, we believe) as Shirley Pryde, carried off her trying scenes with charm and naturalness, crowning a very successful rendering of the part by her acting in the last scene. Miss Margaret Henneker was excellent as the hard and showy Muriel, and Mr. Cyril Leigh gave a delightful and characteristic rendering of Chussie Hare. The villain (if we may so style him), Lomax, was in the capable hands of Mr. Pilkington, and Miss Cowan made us wish we could see more of her. In her brief appearances she gave us the exact portrait of Mrs. Hanbury in a few bold strokes. Miss Emery was tender and sympathetic as Mrs. Farren, and particularly good in the death scene. The play was received with great enthusiasm, the producer, Mr. Hodgson-Bentley, coming in for a full share of the ovation. It remains to be added that Mr. Will Harrison's orchestra provided some interesting music.

RETIREMENT OF MR. H. J. MACLURE.

A LARGE body of colleagues and friends assembled in the Deputation Room, G.P.O. North, on Mar. 19, to say farewell to Mr. H. Julius Maclure. A table, clock, and other presents had been subscribed for as a memento of the occasion, and Mr. F. H. S. Grant, Assistant Secretary, in making the presentation, wished Mr. Maclure, on behalf of his colleagues, long life, success and happiness in his retirement.

Mr. Maclure entered the service of the National Telephone Company far back in the 'nineties, after having had experience of telegraphs with the old London, Chatham & Dover Railway. After some years in the Stores Department he showed an aptitude for organising canvassing work, and was perhaps best known for his successful and untiring efforts as Contract Manager at Brighton, when the National Company was engaged in its struggle with the Brighton Corporation system. At and after the transfer to the Post Office he was Contract Manager at Birmingham. He was promoted to be Inspector of Contract Departments in the Secretary's Office in December, 1913, and in April, 1921, became a Staff Officer. Mr. Maclure, who is a man of unbounded energy and vitality, was an authority on schemes for telephone development.

PROGRESS OF THE TELEPHONE SYTEM.

THE total number of telephone stations in the Post Office system at Jan. 31, 1930, was 1,855,636, representing an increase of 7,168 on the total at the end of the previous month.

The growth for the month of January is summarised below :—

	London.	*Provinces.*
Telephone Stations—		
Total at Jan. 31	665,344	1,190,292
Net increase for month	3,367	3,801
Residence Rate Subscribers—		
Total	163,536	255,721
Net increase	1,296	1,665
Call Office Stations (including Kiosks)—		
Total	5,922	24,396
Net increase	119	275
Kiosks—		
Total	1,625	6,060
Net increase	44	100
Rural Party Line Stations—		
Total	—	10,218
Net increase	—	—
Rural Railway Stations connected with Exchange System—		
Total	17	1,506
Net increase	—	53

The total number of inland trunk calls dealt with in November, 1929 (the latest statistics available) was 9,657,997, representing an increase of 685,605, or 7.6% over the total for the corresponding month of the previous year.

Outgoing international calls in November numbered 47,814 and incoming international calls 52,193, representing increases of 8,140 (20.5%) and 10,959 (26.6%) respectively over November, 1928.

Further progress was made during the month of February with the development of the local exchange system. New Exchanges opened included the following :—

LONDON—Shepherds Bush, Primrose (automatic).

PROVINCES—Dudley, Brierley Hill, Cradley Heath, Stourbridge (all automatic); Ashwell, Benburb, Bolton Abbey, Denholme, Hanmer, Hardwick, Long Sutton (Hants), Morham, Normanby-by-Spital, Riccall (all rural automatic),

and among the more important exchanges extended were :—

PROVINCES—Aylesbury, Clydebank, Newport (I. of Wight), Ramsgate.

During the month the following additions to the main underground system were completed and brought into use :—

Guildford—Reading (Section of Guildford—Reading—Basingstoke cable);

Bradford—Huddersfield;

while 76 new overhead trunk circuits were completed, and 87 additional circuits were provided by means of spare wires in underground cables.

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The Telegraph and Telephone Journal.

PUBLISHED MONTHLY IN THE INTERESTS OF THE TELEGRAPH AND TELEPHONE SERVICE, UNDER THE PATRONAGE OF THE POSTMASTER-GENERAL.

Editing and Organising Committee - - - Lieut.-Col. A. A. JAYNE. J. STUART JONES. W. D. SHARP. W. H. U. NAPIER. J. W. WISSENDEN.

Managing Editor - - W. H. GUNSTON.

NOTICES.

As the object of the JOURNAL is the interchange of information on all subjects affecting the Telegraph and Telephone Service, the Managing Editor will be glad to consider contributions, and all communications together with photographs, diagrams, or other illustrations, should be addressed to him at the G.P.O. North, London, E.C.1. The Managing Editor will not be responsible for any manuscripts which he finds himself unable to use, but he will take the utmost care to return such manuscripts as promptly as possible. Photographs illustrating accepted articles will be returned if desired.

VOL. XVI. APRIL, 1930. No. 181.

TELEPHONE COURTESIES.

IT is singular that while the telephone habit grows daily, and the use of the telephone is now common to hundreds of thousands who not long since regarded it as a privilege or perquisite of their more favoured fellow citizens, telephone manners still leave something to be desired, still afford a text for social sermons, and a theme for justifiable complaint. We hope and believe that the uncouth office boy who greets callers with an aggrieved "Who are you? What do you want?" is fast disappearing as an amateur telephone operator. We know that the employment of trained telephonists by private people is on the increase, and that apart from their professional handling of enquiries, it is becoming the rule rather than the exception for the telephone to be answered with courtesy and intelligence, and, in those cases where a private branch exchange is in use, for someone to be in attendance who can promptly put the caller in communication with the person he requires. This is, no doubt, a great stride forward in improving the amenities of the telephone.

There is, however, a form of discourtesy which seems to die very hard and which is still a source of exasperation to the most patient of telephone users. It is the habit of instructing a subordinate to put a call through, and then keeping the correspondent at the other end of the line waiting until one has leisure to attend to him. A professional man (and his case is typical of many others) complains bitterly in the *Bradford Telegraph & Argus* that he probably loses many hours a week by this kind of discourtesy. "The bell rings. I take up the receiver. 'Hello!' says someone. 'Mr. A wants to speak to you.' Then I wait, and Mr. A may be two or three minutes before he condescends to come to the 'phone to take his own call."

There can be no objection, of course, to a busy man's asking his clerk to get a call through for him, if he is actually beside the telephone and is there to answer it when the number is obtained. But when the other man, having been rung up, has answered the telephone with due promptitude, and is then asked to "Wait a minute" while his correspondent condescends to come to the instrument, he naturally feels aggrieved. He very justly considers that his time may be as valuable as that of his interlocutor, and his annoyance is not lessened by the knowledge that the discourteous practice may not be due so much to business pressure as to a kind of fussy self importance which is fond of displaying itself in the employment of intermediaries through whom correspondence must ceremoniously pass before it reaches the great man himself.

A conscious or unconscious egotism is probably at the root of this habit. This quality or attribute may go far in life but not, we think, in the great business world. You may be in the enviable position of being able to make others take you at your own valuation, but, unless you are, a nice consideration for the susceptibilities of other people will further your interests best, both in your telephonic and other social dealings with others. To put the matter on no higher footing, it is safe to say that petty egotisms simply do not pay.

WINTER'S TALE.

THE winter which has now luckily passed will be long remembered for its gales and the vast damage done to shipping and to the exposed parts of the coast. The statistics for 1929 cover half of the 1929-1930 winter, but they show that the Post Office wireless stations dealt with 128 wireless calls for assistance (S.O.S.), or nearly double the average yearly number for the preceding four years. This number, large though it may be, is really small compared with the number of casualties which would doubtless have occurred if gale warnings had not been sent out by wireless telegraphy long before the first signs of bad weather could have been detected by observations on the ships themselves.

Wireless has undoubtedly done much to ensure greater safety of life at sea by the collection of meteorological information from ships in distant waters, the dissemination of gale warnings and weather forecasts, and the summoning of assistance in the last resource when shipwreck was otherwise inevitable.

AN EPIC OF THE SEA.

WE recently had an opportunity of perusing the log of a ship in distress during the December gales—short, matter-of-fact statements, and questions and answers by wireless-telegraphy exchanged and recorded amidst the turmoil of the waters and the wild shrieking of the winds. Yet when read in cold blood, the

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very brevity added intensity to the narration, of which only the bald facts are recorded here.

Our epic began at 8 a.m. on a Saturday and continued uninterruptedly until 11 a.m. on the following Monday morning; and our readers will need no great effort of imagination to recognise the stark, staunch heroism of 51 hours of strenuous endeavour.

We learn that amongst other damage the wireless aerial had been carried away during the previous night, the steering gear broken, No. 2 hatch stove in and the lifeboat damaged. A temporary aerial was rigged, and after many hours the first wireless appeal for assistance became possible. Then the hatch was repaired and an effort made to repair the steering gear. Meantime a British ship was diverted and with the aid of wireless direction-finding apparatus was able to get as near as four miles away. The steering gear could not at first be repaired because it was under water; and as there was a risk of the ship being driven on a lee shore, a tug was asked for. We learn that the ship was rolling excessively and the seas were breaking aboard. The steering gear was at last repaired, but unfortunately was again carried away. At midnight on Sunday the ship in distress and the tug were able to communicate by lamp signalling; and the weather having moderated at daybreak a light line was thrown from ship to tug as the first step towards rescue.

At 11 a.m. on Monday the wireless operator asked the tug to take any traffic for him as he wanted dry clothes and some sleep. And well did he deserve it!

HIC ET UBIQUE.

TELEPHONE service was opened between this country and Kavnas (Kovno) and Klaipeda (Memel) in Lithuania on the 15th of last month. The charge for a 3-minute day call from London is 17*s*. A service to Riga in Latvia is likely to be opened at an early date.

We have received the balance-sheet and statistics of the Guernsey States Telephone Dept. A surplus of £682 5*s*. 6*d*. is shown for the year 1929, during which year the number of telephone lines increased from 4,226 to 4,353 and the number of calls from 2,607,855 to 2,720,336.

A paragraphist in the *Evening News* says *à propos* of the transatlantic service:—

> In any case, I have no intention of exchanging £15 worth of backchat with my rich cousins in Milwaukee because, if I do, the Post Office, when it sends me my bill, will insist on my increasing the deposit which I had to make when I first installed my telephone.

As a humorist it is not his business to know that no deposit is asked for in respect of transatlantic calls, but perhaps it is ours, as realists, to enlighten him. He may become a transatlantic "telephone addict," as he styles it, without additional deposit.

The repercussions of the telephone are many and unforeseen. Sir Ralph Wedgwood, General Manager of the L.N.E.R., speaking to the Halifax Chamber of Commerce, says he has been confronted with the fact that the coming of the telephone has gradually wrought an extraordinary change in the goods traffic with which he has to deal. Much has been heard of late about the need for bigger railway wagons. (A demand for such wagons was the newspaper stunt which preceded that for a United Empire party, if our memory serves us aright, interjects the *Yorkshire Evening Post*. Those stunts are so various and so soon dropped and forgotten, that we may be pardoned for not keeping their exact order of date in mind.) But Sir Ralph shows that, to a great extent, the big wagon is uneconomic nowadays.

The trader who used to keep large stocks in hand to meet the requirements of his customers is now mostly content with samples. When he books an order, he simply rings up the manufacturer on the telephone, and asks him to despatch the goods. Thus it is the manufacturer, not the trader, who has to keep big stocks on hand nowadays; and the manufacturer, instead of having big orders to execute, has to send away his goods in small parcels. Thus speed, not bulk, is the dominating factor in transport now so far as merchandise is concerned. That is where the motor lorry has come in, and taken away so large a proportion of the railway companies' goods traffic. The railways, however, under their new powers, are adapting themselves to the situation.

The annual report of the American Telephone & Telegraph Company for 1929 shows an increase in the number of telephone stations in the "Bell" system and its connecting companies of 899,819. The total number of stations was 20,096,854, of which 15,414,015 belonged to the "Bell" companies, and 4,682,849 to the connecting companies. 4,014,153 of the 15 million were working on the automatic system. The average daily number of toll conversations was upwards of 3 millions, and of local conversations 61 millions.

We are publishing next month an abridged illustrated report of Col. Lee's paper on Transatlantic Telephony read before the Post Office Telephone & Telegraph Society.

RELICS OF THE C.T.O. IN DEVON.

As during the past years one and the other of the old brigade of Telegraph men of the London C.T.O. have disappeared upon reaching the age-limit, the question has been frequently asked: "Where do they all hibernate?" Judging from reports from more than one correspondent in the district, the county of Devon holds not a few of the stalwarts of the past. One report which arrived too late for the December issue gives every evidence that the annual gathering of Post Office retired officials, held in Torquay, proved a veritable galaxy of veteran talent and vitality. One, a *reputed* Scotsman by extraction, but most certainly a loyal Devonian by adoption, took the chair at the gathering, in the person of Mr. J. B. Murray. So very busy are some of these ex-T.S.-ites that three at least of them had to express their regret at being unable to attend owing to prior engagements!

The late Asst. Controller of the Cable Room, Mr. F. T. Wadley, happily enough was able to set all engagements aside and joined the merry party, as did others likewise, notably Mr. C. H. Honeysett, formerly of T.S., but who was actually Postmaster of Henley-on-Thames when he left active service. Music, tales of bygone years, not without a touch of romance and—imagination! Music, perhaps beyond the prime, but music, nevertheless, and then a little quiet game or two at cards to complete a very happy evening.

J. J. T.

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Caracas, a city of over 100,000 population, is the business and commercial centre of Venezuela as well as its capital, and is one of the most modern and progressive of South American cities.

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The Automatic Electric Company,

In Canada . . . Independent Sales and E
Vancouver
In Australasia . . . Automatic Tele
In Japan . . . Automatic Telephone

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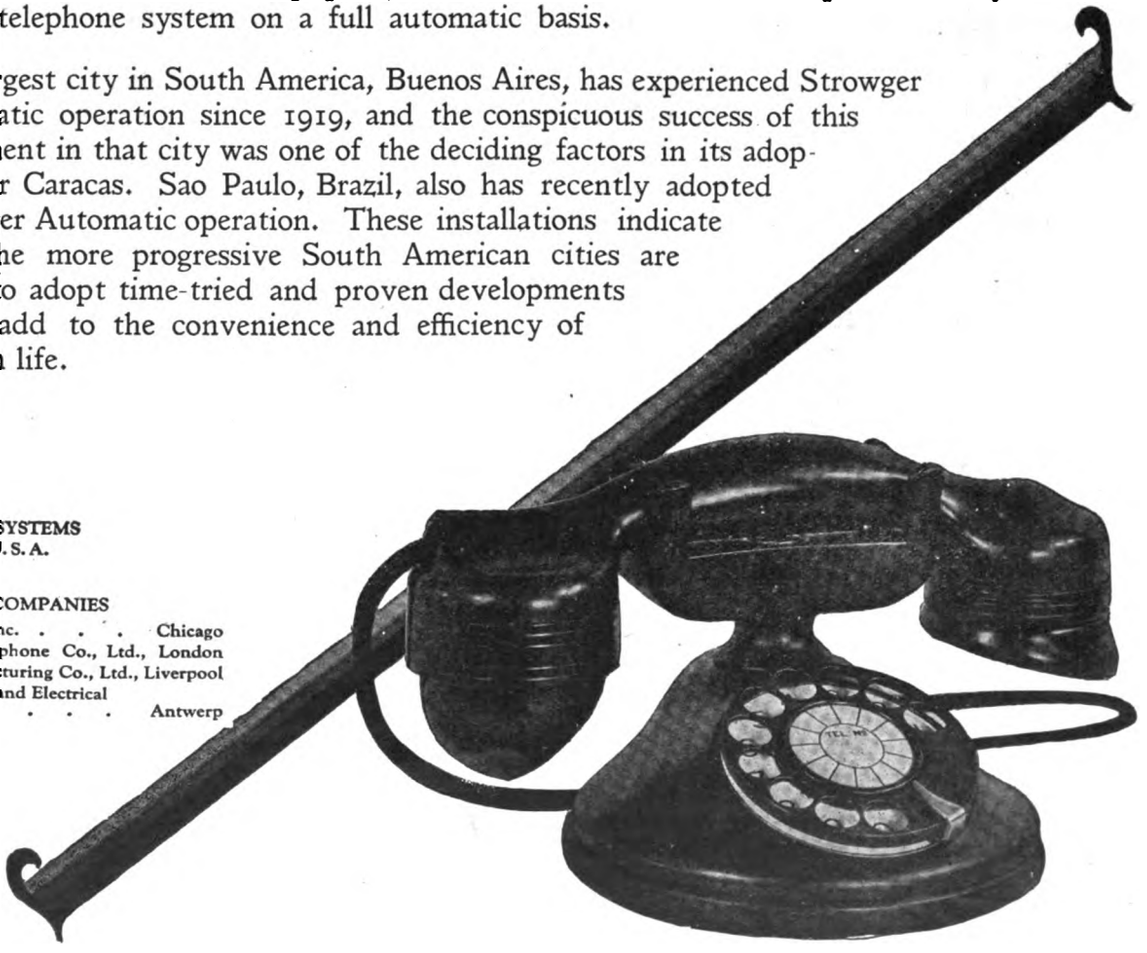
epeat Orders Confirm Strowger utomatic Success in Caracas

VENEZUELA'S capital city, Caracas, has found in Strowger Automatic telephone equipment the most satisfactory solution to its telephone needs. Beginning with 1,000 lines of Strowger Automatic equipment installed in 1927, the Venezuela Telephone Company has installed and placed in service 3,000 more lines during 1928, bringing the present total up to 4,000 lines of Strowger Automatic equipment in operation. An additional 2,000 lines is now being installed which will give Caracas 6,000 lines of equipment within a short time, and will place the city's entire telephone system on a full automatic basis.

The largest city in South America, Buenos Aires, has experienced Strowger Automatic operation since 1919, and the conspicuous success of this equipment in that city was one of the deciding factors in its adoption for Caracas. Sao Paulo, Brazil, also has recently adopted Strowger Automatic operation. These installations indicate that the more progressive South American cities are quick to adopt time-tried and proven developments which add to the convenience and efficiency of modern life.



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CANVASSING METHODS.

BY J. TURNER, CONTRACT OFFICER, CLASS I, YORK.

WRITING from personal experience, I am of the opinion that there is need from time to time for examination and overhaul of the methods employed in canvassing if we are to reap as great a harvest as possible.

It will, I think, be generally agreed that the expansion of the Telephone Service is most effectively helped by personal canvassing, and it is a prime necessity that there should be an adequate canvassing staff. Publicity of all kinds is to be welcomed, and even the often garbled statements which appear from time to time in the Press tend to keep the subject of telephones before the public mind. The advertising of the T.D.A. in the Press, and the distribution of pamphlets, is all to the good. But it cannot be too strongly stressed that personal canvassing is easily the best possible way of educating the public on the necessity and advantages of the telephone service. Literature can never supersede the personal visit, although literature is a valuable auxiliary, the truth being that man is moved most by contact with his fellows—by the personal touch.

It is an essential qualification of a Contract Officer that he should possess what we call a "good personality," but this alone is not sufficient for success in canvassing. Possible subscribers are influenced very largely by the way the Contract Officer states his case, and the question of the *method of presentation* is therefore one which calls for serious consideration.

The first essential is to *arouse interest* in the mind of the prospective subscriber. It is fatal to step into premises and to announce baldly that one is a representative of the Post Office Telephone Department, and to ask if telephone service is desired. It is a good plan on the occasion of a first visit to ask "Are you on the telephone?" (In many cases during systematic canvassing it is not always known by the Contract Officer if the premises are connected or not.) Or the subject may be introduced by the remark: "I see you are not on the telephone." The vision of a telephone installed in his premises is thus artfully introduced into the mind of the canvassed person without raising the antagonism which unfortunately is so easily aroused by the mere mention of a Government Department, or by the immediate suggestion that your object is to induce him to do something which will touch his pocket. In many such cases it will be found that one is taken for an ordinary member of the public and the way is paved for an easy conversation on the subject of telephones. A wise Contract Officer will not carry an attaché case of any kind which might give the suggestion that he is a commercial traveller, as these frequently receive but scant courtesy and in the case of residence canvassing the chance of entrance is greatly reduced.

The next step is to *impart knowledge of the subject.* Arguments for its use should be carefully stated, taking particular care that those reasons specially appropriate to the business of the prospective subscriber are stressed. If the arguments used have been convincing, a desire to possess has been created, and at this point the appeal to the strong tendency to rivalry which exists in most people should be made: "Don't you think it would be a good thing to have it installed and possess what so many of your competitors have?" (or if residential canvassing, substitute "friends" or "neighbours" for "competitors").

The next stage is the question of cost. This requires to be very carefully stated, and the most effective way is to give the *weekly* cost, i.e., 2*s.* 8*d.* for business; 2*s.* 1½*d.* for residences, rather than to state outright the yearly or quarterly rental.

The final step is, of course, the decision. It is surprising how many persons need to be helped to a decision. And this is where the Contract Officer should bring the whole of his personality into play, and bring his will to bear upon the will of the canvassed person. When it is apparent that an impression has been created by the arguments used, and, by the appeal to the acquisitive tendency, that moment must be seized to press for a decision at once.

It is a common experience to find a likely subscriber resisting stubbornly for quite a while and then suddenly and unexpectedly giving way. Persistence pays, so long as it is carried on tactfully. Of course, in some cases, the decision has to be left in abeyance but a deferment should not be taken too readily, and often a temporary change of subject to something of apparent personal interest to the would-be subscriber and a return to the original theme later will have served the purpose of letting the resistance die away. The wise Contract Officer will, of course, in cases where an immediate decision cannot be got, always leave literature and a tariff postcard, making it as easy as possible for a communication to be sent to the District Office.

Canvassing for additional lines and extensions requires great tact and discretion. The best method of approach in those cases where an application for additional facilities has not been received and pure canvassing is taking place, is usually to open the interview by asking if the installation may be inspected and not merely by inquiring if extensions are desired. Most subscribers readily agree to show the installation, and usually it is very easy to suggest that his service would be much improved by extension lines. It may even in some cases be effective to express surprise at the inadequacy of the installation. By careful questioning it can be ascertained how the subscriber deals with traffic. In those cases where only one instrument exists, it is generally found that the suggestion of an extension to enable him to speak privately or to enable his clerk to deal at the outset with incoming calls, is appreciated. The very small cost should, of course, be stressed.

The question of auxiliary lines can be introduced without waiting for traffic records. The small cost of doubling the service in those cases where only one line exists, i.e., approximately 2*s.* 6*d.* per week, should be urged, and generally it is found that the subscriber is impressed by the comparatively low cost of giving him a double service.

RETIREMENT OF MR. P. EDMOND, DISTRICT MANAGER, ABERDEEN.

MEMBERS of the Post Office telephone staff at Aberdeen honoured Mr. P. Edmond, District Manager, on the occasion of his retirement from the service.

Mr. Archibald Clow, chief clerk, referred to the large extension of the telephone undertaking during the five years of Mr. Edmond's managership at Aberdeen. This development had been specially evident in the rural districts, where a large number of exchanges have been opened in the last few years. Mr. Edmond also saw the introduction of the latest development in telephone exchanges—namely, the "rural automatic"—such exchanges being opened in several places in the Aberdeen district during 1929. A great development had also taken place in trunk communication, as Aberdeen subscribers can now converse with most of the European countries and with America.

Mr. W. S. Coulsell, Contract Manager, on behalf of the Staff, presented Mr. Edmond with an antique grandfather clock, and in doing so made reference to Mr. Edmond's high abilities as a manager, and particularly to his friendly relationship with the staff under his control.

Mr. R. W. Crawford, Head Postmaster, Mr. R. L. Forrester, Traffic Superintendent, and Mr. J. B. Glover, Executive Engineer, also paid tribute to Mr. Edmond's good qualities.

Mr. Edmond, in his reply, thanked the whole staff for their kindness to him and for the enthusiastic support which he had received from all sections of the telephone staff.

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GLASGOW TELEPHONE NOTES.

THE subject of our portrait this month is Miss Catherine Jane Fleming. Unlike several of her colleagues, she has not seen service with the Glasgow Corporation Telephones, but was with the National Telephone Company until she was transferred to the Post Office on Jan. 11, 1897, as one of the telephonists required to work the trunk lines which had been taken over by the Department from the Company about this time.

Miss Fleming was made an Assistant Supervisor on July 10, 1905, and Asst. Supervisor, Class II, on Jan. 1, 1908. Promotion to her present rank, Asst. Supervisor, Class I, following on Nov. 7, 1918.

In the course of her career Miss Fleming has had considerable experience of operating under varying conditions of lines and apparatus, and also of Trunk Exchange working in all stages of its development, from the somewhat crude conditions of early days to the more complex and scientifically adjusted circuits of to-day.

At the time of writing, Miss Fleming is in charge of the Western Exchange, which, from the number of lines connected, is the second in size in Glasgow, but as the subscribers are mostly residential, it does not take second place for traffic.

Miss Fleming takes a great interest in her work and while using every effort to give a good service has the interests of her staff at heart.

It cannot be said that the subject of this fragmentary sketch has any particular hobbies. She likes a good holiday, the companionship of her friends, and the actions of a kindly heart, which latter we most cordially endorse.

Glasgow Post Office War Hospitals Entertainments Committee.—The work of the above Committee goes on merrily. The recent entertainment at Erskine Hospital which the staff of Bell Exchange was responsible for was one of the outstanding successes of the season, but when we remember the name of the exchange responsible for the concert it was only to be expected. High tea was provided, beside which sweets, cigarettes and grapes were distributed and were greatly appreciated. At the musical part of the entertainment Mr. Lucas, Contract Manager, presided, and at the start created the right atmosphere for a successful concert. Miss Cissy Pollock (Bell) provided the party of artistes and one and all, including herself, excelled themselves in their own particular line. Mr. Law, Chief Clerk, Mrs. Law, Miss Cameron (Central) Miss Houston (Bell) supported Mr. Lucas in the conducting of the entertainment.

Telephone operators get some strange enquiries in the course of their duties, such as "Which pantomime will Tommy Lorne be playing at this year, and when does it start?" but the limit was reached the other morning at Bearsden Exchange (5 a.m.) when, on answering the door bell, the night operator was confronted by a regular "Knight of the Road," who enquired if he could have a bed.

The Bell Exchange staff held a very successful dance in the Prince of Wales Rooms on the evening of Tuesday, Mar. 11. The rooms were filled to capacity and the happy atmosphere surrounding the proceedings was excelled only by the splendid example of how these things can be done, this especially concerning the charming dresses of the ladies. Miss Houston, Miss Campbell and the committee responsible are to be sincerely congratulated on the results of their efforts. And so say all of us.

On Qualifications and Fine Distinctions.—"Estimate the qualifications of men by the utility of those employments on which they bestow their attention."—(Aurelius.)

"Plato divided the people of his ideal republic into three classes: the philosophers, who did the thinking and ruling; their lieutenants, who executed orders; and the great mass of the people, who were mostly slaves. Montesquieu put in the first class men who were able to think and give ideas; in the second those who cannot do original thinking but can understand the ideas of others; and, finally, those who can neither think nor understand the thinking done by others."—(M.)

"The requisites of a £2,000-a-year man:—

(*a*) Judgment, prudence, enterprise, and fortitude in undertaking and carrying risks;

(*b*) An alert acquaintance with appropriate technique and some power of initiating advance;

(*c*) A high power of organisation, in which system plays a part, but 'always as a servant but never as a master';

(*d*) A power of reading character in subordinates, together with resolution, tact, trust and sympathy in handling them;

(*e*) Prompt diligence in assigning to each the highest work of which he is capable, or can be made capable within a moderate time."—(Anon.)

"A sort of cold dismay—something akin to fear—filled me when I had estimated him. I found a man so perfectly poised, so charming, so deeply learned in the world's rituals, so full of tact, courtesy and hospitality, so endowed with grace and ease and a kind of careless, haughty power, that I almost overstepped the bounds in probing him, in turning him on the spit to find the weak point that I so craved for him to have."—(O. Henry.)

"He is a man of virtue, and comely, and good parts enough—one of the worthyest men and best officers; of the best temper, valour, abilities of mind, integrity, birth, fine person and diligence, and hath come into his place with a great grace, though with a great skip over the heads of a great many."—(Pepys.)

"He was a man so various that he seemed to be,
Not one, but all mankind's epitome;
Stiff in opinion, always in the wrong,
Was everything by starts but nothing long;
Who, in the course of one revolving moon,
Was Chymist, fiddler, statesman and buffoon;
Then all for . . . painting, fiddling, drinking;
Besides a thousand freaks that died in thinking."
(Dryden.)

"Comes Mr. Herbert, Mr. Honiwood's man, and dined with me, a very honest, plain, well-meaning man, I think him to be; and by his discourse and manner of life, the true emblem of an old serving-man."—(Pepys.)

THE LATE ADAM GORDON.

THERE are men who, no matter how humble their position in life, yet stand out by common consent among their fellows. Such an one was Adam Gordon as a member of the rank and file of Government telegraphists, such an one was he to the end of his official career as successively he passed, all too slowly be it said, from Overseer to Asst. Second, and then to Asst. First Class Superintendent of the C.T.O., retiring at the age limit in July 1919. It cannot always be assured of such that they reach the goal of their legitimate worldly aspirations, but it can be said of them that they are captains of their souls. Of this worthy clan was the beloved Adam Gordon, who opened his telegraph service in Dundee in 1875, transferring to Edinburgh in 1878 and to the C.T.O. London in 1882. Intellectually he was head and shoulders above most of his colleagues, but he never used his sharpest sword against the weak or revealed the extent of his knowledge ungraciously to the less well-informed. For years he wrote caustically over the pen-name of "Cynicus," but if he was mordant one cannot recall a case in which the mordancy did not fit the crime, and it was the crime always in preference to the criminal at which he aimed. When it came to a *viva voce* engagement his almost uncanny quickness in picking out the weak spot in his antagonist's defence rarely if ever failed. He parried well, but seldom to wound, and even then it was the rapier rather than the bludgeon, for he would have given his last shilling to friend or foe did the need arise. Injustice, hypocrisy, shams of any kind opened a flood of denunciation, in which the English language could hardly have been better handled by the best of barristers. In bantering mood he was the life and soul of any gathering, and now the place that knew him shall know him no more. It is no unreal phrase to use as between man and man that Adam Gordon will always remain as one of the most beloved men who ever passed out of the C.T.O. London.

He had been ailing for many months, but had apparently taken a real turn for the better when a relapse occurred from which he never recovered, and crossed the Bar on Saturday morning, the 15th ult.

The funeral took place at Streatham Cemetery on the 18th ult. There were many floral tributes from old friends and colleagues and also from the C.T.O. Among the large number present at the graveside were: Messrs. G. Adams, H. E. Adams, J. R. Allwright, C. Bent, E. Bird, C. J. Boulton, J. A. Buffin, W. J. Callow, W. S. Fisher, W. F. G. Hodes, R. E. Kemp, C. J. Minors, R. H. Mulock, F. J. Muller, G. Meyer, G. W. Murdoch, S. F. Pace, H. Pond, E. F. Poole, J. Rees, J. E. Sayers, H. W. Senhenn, S. J. Smith, G. E. Taylor, A. A. Watts, H. B. Winder, and Captain H. R. Young, M.B.E. Mr. C. S. Keen who was also present conveyed to the mourners the regrets of those who, due to indifferent health and other unavoidable circumstances, were unable to pay their tribute in person.

J. J. T.

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CORRESPONDENCE.

WIRELESS BROADCAST RECEPTION.

TO THE EDITOR OF "THE TELEGRAPH AND TELEPHONE JOURNAL."

SIR,—In reply to the letter in your March issue from Mr. J. W. Willshire asking various questions consequent on my article on "Distant Control of Broadcast Receivers." My distance from Brookmans Park is approximately 20 miles, and for quality reception a trigger circuit is used. This distance is the limit of its effective operation without H.F. amplification. It gives good detection providing the incoming signal is above a certain threshold value, and perfectly straight line L.F. amplification over the whole frequency range.

The details of its operation require considerable explanation, cannot be embodied in a brief letter, and are rather outside the scope of this journal.

Providing I am not charged with starting a fierce controversy I give my own candid opinion about moving coil speakers. For ordinary domestic use there are many speakers that not only hold their own against the moving coil but are in some respects very definitely superior to it.

One of my cabinets contains a reed movement made nearly 20 years ago for an early pattern of telephone relay and this cabinet is invariably accused of harbouring a moving coil, presumably because it reproduces so well the bass violin and pedal notes of the organ.

The exposure of the "works" of this speaker is always greeted with a hearty laugh, for the movement only leans against the diaphragm, which consists of a small paper cone stuck in the middle of a linen handkerchief stretched across the front of the cabinet. By a little sleight of hand when opening the cabinet, the movement is whisked away and there is practically nothing to be seen.

Generally speaking, the moving parts of a moving coil speaker are too large for satisfactory reproduction for domestic purposes. *They lack brilliance.*

A moving coil is only happy with a kilowatt or so behind it, rattling the windows of the Albert Hall.

I do not recommend a pentode. It is too tricky and apt to deliver a shrieking, strident tone. Use a sufficiently large power valve which, when a wide scale milliammeter is placed in its anode circuit, will allow the needle to remain dead steady on all signals. This, however, only ensures even amplification of what the detector passes on; and most detectors are a compromise between various conflicting factors.

The principal causes of distortion are: (1) overloading of output valve, (2) the use of reaction following a grid leak detector, (3) overloading a grid leak detector.—Yours faithfully,

B. S. T. WALLACE.

RETIREMENT OF MISS L. M. DURANDEAU.

(Supervisor, Central Exchange, Liverpool.)

IN April, 1886, Laura M. Durandeau entered the service of the National Telephone Company as an operator, and on Feb. 28, 1930, she retired under the age limit from the position of Supervisor of the Central Exchange, which was nominally the same Exchange she entered, and which she had been in charge of since 1904.

To say that she was popular does not nearly convey the whole truth. There are degrees of popularity. The girls who have worked under her loved her and the men who have from time to time been brought into contact with her had the greatest admiration and respect for her.

Her name will long be remembered in the annals of telephony in Liverpool, and but for her dislike of publicity she might have been better known in a wider field. She was certainly worthy of appearing in the series of "Telephone Women" published from time to time in the *Telegraph and Telephone Journal.*

She had few hobbies, while her main object in life was her business. Her service has been characterised by devotion and enthusiasm. Her personality has made her the friend of all she came in contact with. Though firm in her methods she ruled with justice, tact and kindness, and was able to obtain the maximum of support with the minimum of friction and get the best out of her staff. She is the type of woman wanted and who can ill be spared.

As evidence of her popularity with her staff, her parting testimonial from them was perhaps unique. When it was known that she was going to retire, the girls felt that they must give her something worthy of the occasion and of their feeling for her. They, therefore, it is rumoured, started a hidden fund and contributed their pence weekly for quite a long period and when the day had almost arrived held a Social function at the Central Exchange, confined entirely to operating staff—past and present—in order to mark the occasion, at which Miss Camidge, a contemporary Supervisor, on their behalf handed over to Miss Durandeau a Bank of England Note for £100. She also received many personal gifts.

On the day of her retirement a second function was held when all her Exchange Supervising Officers, the District Manager and the whole of the Traffic Officers were present, and Mr. Gauntlett, in appropriate terms and with expressions of best wishes, on their behalf presented Miss Durandeau with two easy chairs (her own choice). After tea was partaken of the party ended the evening by a visit to the Empire Theatre.

So passed out another pioneer.

LIVERPOOL TELEPHONE NOTES.

WE congratulate Miss A. M. Craig on her promotion to Supervisor, and Miss A. G. McDevitt to Asst. Supervisor, Class I.

We were pleased to see the article on Telegraphs and Telephones in Egypt in the March *Journal* by our old colleague, Mr. F. C. Burstall. He is maintaining the prestige of Liverpool, from whence he emanated, and we congratulate him.

We have just opened our first R.A.X. in the Liverpool District, viz., at Knowsley. The Liverpool district is so well covered by exchanges that a new additional exchange is somewhat exceptional, but we still hope to find a few clear spaces to fill in. Another R.A.X. at Hale is well on the way to completion.

WESTERN TELEPHONE DISTRICT NOTES.

ALTHOUGH geographically nearly off the face of the map, the district is, just now, very much in the centre of activities, both as regards telephone progress and social affairs. It has always occupied an enviable position in respect of percentage increase of new subscribers, and there is every prospect of this continuing for many years to come. Socially the district is not lacking in enthusiasm, although it cannot get together the big gatherings similar to those in the more concentrated districts, as the Western District is of a very scattered nature. On Feb. 26 a social was held at which there was a gathering of 130 members of the staff and their friends. During the evening opportunity was taken to present Captain R. S. Ward, Traffic Superintendent, Class II, who had just retired from the service, having attained the age limit, with two beautiful pictures of Dartmoor and Exmoor scenes, also a fountain pen, and to Mrs. Ward a silver mirror. Captain Ward left the London Telephone Service for the provinces in 1913 and was stationed in Exeter from that time right up to his retirement, the only break being during the war, when he was on active service. Captain Ward will be well remembered in London as Exchange Manager at Kensington Exchange for some years. Mr. T. A. Beck, the District Manager, made the presentation, to which Captain Ward suitably responded. The Surveyor, Mr. A. O. Spafford, O.B.E., was present, as were representatives of the Engineering Staff.

Prizes were given during the evening in connexion with the dance.

On Feb. 10 Mr. Beck inaugurated a series of meetings designed to afford members of the staff an opportunity of becoming acquainted with the whole range of activities of a district office. The meeting on that date was devoted to papers appertaining to the Contract Branch, read by Mr. Hornsby on Development Studies, Mr. Hamer on Canvassing and Mr. Baglow on Contract Office Clerical organisation. The Chair on this occasion was taken by Mr. C. W. Beauchamp, Contract Manager. An appreciative gathering of over 50 members of the staff was present. The second meeting was on Mar. 3, when papers were read dealing with the Accounting Section; by Messrs. Skinner and Green and Miss Paynter—the Chair was taken by Mr. W. S. Kay, Chief Clerk. Nearly 70% of the whole staff were present, which is evidence of the popularity of these meetings. The next meeting is to be devoted to the reading of papers by members of the Traffic Staff.

Having broken the ice in the matter of journalism the Western District hopes to record events regularly in future.

SOUTHAMPTON NOTES.

ON Dec. 14 a large number of her colleagues gathered to say good-bye to Miss A. Rolls, Clerical Officer, who was resigning on account of marriage. Mr. C. G. Weston, Staff Clerk, presided in the absence on business of the District Manager.

Mr. Weston, in a short speech, extended congratulations and best wishes to Miss Rolls, and asked her to accept a silver dressing-table set as a tangible expression of the regard with which she was held by her associates in the telephone service.

In reply, Miss Rolls thanked Mr. Weston and the staff for their gift and kind wishes and recalled the very happy times that she had spent with them.

Her friends throughout the country will hear with much pleasure that Miss C. S. Moore has been promoted to Higher Clerical Officer, and remains at Southampton. We know how she deserves promotion, and she carries with her the congratulations and best wishes of her colleagues.

Our annual Whist Drive and Dance arranged for Jan. 31 was a great success. The District Manager, Mr. O. G. Lee, was there as usual, and shared the pleasure of the evening with his staff.

When presenting the dance and whist drive prizes at the end of the evening our chief made it clear that he did not think much of modern dance tunes. Among the musical numbers of the evening was the old familiar "Daisy." True, it was given a great reception, but some of the dance enthusiasts could not agree when Mr. Lee suggested that "Daisy" would outlive such triumphs as "The Fairy on the Clock."

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We feel sure that those of our readers who, at a recent meeting of the London Telephonists' Society, had the pleasure of hearing Miss Ellt, of Selfridge's, deliver her paper on "My Service" from the viewpoint of a Saleswoman, will welcome the opportunity of reading it here; and those who were not present on this occasion will doubtless welcome it, too, although they will not be able to associate the reading of the paper with the recollection of the delightful personality of the author, which added so much to its rendering.

"My Service."

The word "Service" has acquired an inferiority complex because we—in our usual careless handling of our language—have misapplied it so often that we have given it a sort of class distinction.

This is all wrong. Service is one of the most generous words we possess—in its broadest sense it represents a quality which, in the rush of the present day, is as pleasing a contact as a friendly handshake. People are too apt to forget that Service is linked inseparably with all our finest traditions—with the Army and the Navy and the merchant ships which have upheld and maintained those traditions, and with the highest awards of merit with which we honour deeds of distinction.

There are degrees of Service but there is no question of one social class being left to demonstrate it more than another. The King of a country, for example, often devotes a greater proportion of his life to real Service than 90% of his subjects.

It is a grand quality, for if we can interpret it in its bigness it can attain more for us as a nation and as individuals than almost anything else.

Thinking of Service, I wonder how much British public service has done to win and build up the confidence which is afforded anything and anyone British in other countries.

I was talking the other day to an Englishman newly returned to London after a long absence abroad. I asked him what struck him most about London after being away so long. "The courtesy," he said, "and pleasant helpfulness of those engaged in public service—policemen, bus-conductors, people in shops, porters, newspaper-men—all these people you just ask something of—perhaps never to see again. It may only be "ships that pass in the night and signal each other in passing"—but there is a pleasant glow in their courtesy no matter how rough, which goes to make up a welcome. You Londoners are so used to it that you don't notice it, but you miss it when you are away and you see it when you come back. I think that is one of the first things which make foreigners' hearts melt towards London as a city."

The Chinese have a saying: "The good heart does a little extra," and it is just in carrying out that maxim that real Service is achieved. Putting into your job more than you are asked to put into it—thinking of the other fellow's point of view—giving him the sort of Service you would look for yourself.

As a Saleswoman, I should like to talk to you about Service as I see it, for I am in contact with it, all and every day, both in the way of receiving it from others, and in endeavouring to distribute it as a department and as an individual saleswoman. Salesmanship in all its branches is, of course, Service. The art of Salesmanship I would sum up briefly as "Believing something and convincing others." This can only be achieved through Service. In the first case by the service of studying your job all the time, and, secondly, by demonstrating that knowledge to the very best of your ability.

Both these require Intelligence, Sound Judgment, Reliability, Perseverance, as their four corner stones. Then you can begin to build. Next comes a knowledge of Human Nature, a liking for people, and an ability to work late and long—for if you are to make a mark in your job you must learn to love it as an engineer loves a bridge he is building. Men say women can't love their work—that they do it either because they have to, or, because they like making money. We know that is not true. A man once pronounced—after long and profitless study of the subject: "You never know what a woman is going to do until she does it—and then you're not quite certain!" They haven't really quite got used to 75% of the women doing jobs, and it will take half a century or more to convince them that we do it for the fun of the game.

But we were talking about salesmanship—and knowing your job. In my particular branch of salesmanship that means knowing your merchandise. The merchandise in this instance is perfumery, toilet preparations, and equipment, cosmetics, in all their thousand sub-divisions—things for which most women have a natural interest which makes study of the subject easy to begin with and all the more fascinating as the first difficult ground is broken. Inevitably, the sale of this type of merchandise draws innumerable questions and requests for advice. This makes a sure knowledge of the merchandise an imperative factor, a knowledge, too, of its properties and how it is made; a knowledge of which cream or lotion would be best for this or that customer and why; which type of perfume would appeal to the taste of this woman and which tint of powder best becomes that. One could talk on the subject for hours, for it is all a concentrated essence of consideration, natural and acquired knowledge, enthusiasm, perseverance and tact.

You learn all this as you learn your job—so don't look down on routine jobs. They're part of your equipment and ultimate ability and, after all, you're learning the way the wheels go round at your employer's expense. Learn as much as you can, as quickly as you can, suiting yourself to your employer all the time. Keep your mind tidy and your stock tidy—be a good housekeeper of both—for if you are not you will never be a good saleswoman. Cultivate judgment—real judgment which does not stop at the prices of things but gets down to fundamentals; *and* which understands values. It spells a trained mind, which applies what the eyes see and links it up with knowledge and demonstration of that knowledge. Remember, clear judgment with medium intelligence will go further than brilliant intelligence without judgment.

Remember, too, that tact and imagination are qualities to be fostered as invaluable assets. They help one to grasp the customer's point of view and to be able to see the buying and the selling side of the counter together in a mirror.

Never force a sale—a customer who buys something against her own judgment is a bad advertiser for your house. A woman who makes one bad purchaser will, subconsciously almost, condemn the whole of your organisation on that one count.

One of the most important things in salesmanship is manner and manners, and foremost in these—a smile. Centuries ago a wise old man from the East said, "A man who has not a smiling face should not open a shop." We know he was right. That smile isn't always easy but it is infectious. The grumpiest, most difficult customer cannot keep up that attitude easily if the person who is serving her is consistently pleasant.

It is imperative to study customers as individuals—if they are of the decisive type, never offer advice—they know what they want, and it is your job to see that they get it quickly and with good Service. If you have anything to say or anything special to offer as likely to be of interest, do so and comment on its advantages. With such customers, showing knowledge of your merchandise is your strong suit. On the other hand, there is the customer who seeks advice and then doesn't take it. She is a difficult proposition requiring very careful handling. It never does to show this type of customer too many kinds of merchandise. It is like a person with no bump of locality being set down at a cross-roads—the longer they look in each direction the more bewildered they become. I find that, perhaps, three items at once are enough and then, if these do not please, the first should be put away and replaced by one other. In such cases it never does to bestrew the counter with merchandise. The very fact that you are taking some away will lead towards a decision.

That brings me to another point: the counter should be cleared after each sale is completed. We all know how uninviting it is to come up to an untidy counter—it is as displeasing as going into a restaurant and finding your table has not been cleared of the glasses and ash-trays of your predecessors. So much depends on display and handling. I have seen a good saleswoman handle the cheapest merchandise in so delightful a manner that the little woman with not a large amount to spend has gone her ways hugging her purchase as if it were above price. Think of the pleasure that saleswoman has given—and of the advertisement for the house. We all love to sell beautiful merchandise but, equally, if we approach it in the right spirit, we can get as much fun out of selling a half-crown article as a £10 one. After all, a simple thing well sold is much more credit to the saleswoman—for beautiful things sell themselves. Salesmanship is fun—and the more aspects you learn of it the better you realise it. Salesmanship—beginning with exchange and barter—is as old as the world and just as fascinating. So many opportunities stretch before the good saleswoman—the usual steps are section head, then under-buyer, and from that, if she has vision and concentration, buyer, with all the responsibilities attached to that position. A position which lets her have her head, and which brings in its train probably foreign travel—an education in itself—giving a better understanding of people and a keener perception of points of view.

(To be concluded.)

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Our Portrait Gallery.

No. 7.—MISS B. REDMOND.

It is typical of Miss Redmond that, when interviewed for details of her career and any items of special interest, she requested that there should be no flattery. An assurance on this point was easily given as Miss Redmond's outstanding characteristics are naturalness and sincerity.

Miss Redmond was born in Ireland but came to England to complete her education. She joined the Telephone Service in 1902 at Central and was promoted to take charge of Richmond Exchange in 1905. Subsequent transfers to Kingston and Putney—a period spent in interviewing candidates for admission to the Service—further moves to Streatham, Gerrard, Western, and finally to her present position as Chief Supervisor of the Holborn Automatic Exchange, have given her a very varied and useful experience.

Miss Redmond's hobbies are the study of architecture and history, and she confesses to a weakness for Continental travel.

Angus Macdonald.

(New Version.)

Oh ! blank were our switchboards and desolate when
The new automatics marched off with our men !
Oh, sad were our hearts as we bade them good-bye,
And they started to dial (maybe to die !).

Oh, stern automatics ! your rule is severe—
And helpless your victims when trouble is near.
We dial with care, tho' we feel quite at sea,
And often get 4 when we "clock" 2 or 3 !

For manual mercies humbly we pray—
And grieve for the girls who have now passed away.
If only our anguish of mind they could see,
They'd gloat o'er the blighters who "groused" at C.B. !

But stay !—there's a ring, a ring on my line,
And a face in the ether quite clear
As I answer the call, television is here !
The face of my broker confronts me afar,
And I know by his phiz that my stock's below par !

C. A. S.

Contributions to this column should be addressed : The Editress, "Talk of Many Things," *Telegraph and Telephone Journal*, Secretary's Office, G.P.O. (North), London, E.C.1.

MANCHESTER NOTES.

IT was not surprising that the opening of "Telephone House" and the resulting transfer of the District Manager's Offices to a more central position in the City should give a considerable stimulus to the awakening interest in social events which was noticeable last year, but the results have exceeded all expectations. The approach of the automatic transfer has made the winter one of unparalleled activity during working hours and it is remarkable, and all the more creditable to the organisers of the various events that the social season should also have been the busiest and most successful on record.

The winter's programme reached an appropriate climax during February, when the Social Committee presented four performances of a complete evening's entertainment, the first which has ever been given by Manchester telephone staffs. The first show was timed to commence at 7 p.m., but interest, or maybe curiosity, had reached such a pitch that large numbers were arriving at 6 o'clock, and at 6.30 all seats were filled. By 7 o'clock the audience was in a state of eager anticipation, almost of tension.

A very fine overture by a trio of telephonists from the City Exchange —Miss A. Gillett (Piano), Miss M. Sheeran (Cello), Miss H. Martin (Violin)— opened the proceedings. The audience was soothed and sat back to enjoy itself. The curtain then rose (unlike most amateur curtains it made its first journey without a hitch) and the first item of the programme was presented. This was a one-act play, "A Mere Man" (by Herbert Swears), acted by eight City telephonists—Miss H. Brockbank, Miss M. Wilson, Miss M. Skermer, Miss I. McKean, Miss G. Totten, Miss N. James, Miss H. Fernhead and Miss V. Logue.

As an amateur and not impartial reporter I will not attempt to describe the play. Here are the views of two professional gentlemen upon whose potted criticisms I would not dare to improve.

Daily Mail.—"A Mere Man" ends quite definitely with a "Number engaged" for the characters, members of the Emancipated Ladies' Club, all accept proposals of marriage, and all from the same man.

The President of the Club then calls a meeting and says, in effect: "Sorry you have been troubled, I'll marry the man myself."

Daily Dispatch.—All the girls, fresh from the switchboard, acted admirably in making the farce highly amusing, but the gem of the piece was Miss H. Brockbank, who produced "A Mere Man" as well as acted the principal part.

A SCENE FROM "A MERE MAN." REPRODUCED BY KIND PERMISSION OF THE "DAILY NEWS."

Following the play Miss A. Talbot, of the District Manager's Office, gave a very charming rendering of two songs from her repertoire. The audience was by this time quite warmed up, and as a welcome and appropriate surprise ices were served, while further musical selections were played by the trio.

After the interval came the big surprise. The Central telephonists presented "Sinbad the Sailor," a most ambitious four-act Pantomime, which lasted for two hours and certainly held the audience spellbound. The principal parts were played by Miss C. Jenkins, Miss E. Lobley, Miss G. Eadsforth, Miss D. Ferguson, Miss E. Sweeney, Miss R. Mayers, Miss M. Crawford and Miss F. Braddock. They were supported by a hard-working chorus of Sailors, Hawaian Girls and Fairies.

Again I will make way for impartial and expert opinion.

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Daily Dispatch.—I saw them dance the tricky stuff as well as reels and hornpipes. I heard them sing like trained soubrettes. They acted and burlesqued in a manner worthy of the Hippodrome—"Sinbad" was a pantomime without a wrong number—Mrs. Sinbad (Miss C. Jenkins) was sparkling. The staging was a work of art.

SOME OF THE CHORUS OF "SINBAD." REPRODUCED BY KIND PERMISSION OF THE "DAILY EXPRESS."

The high standard of the whole production owed a great deal to the excellence of the scenery and stage lighting effects. A fortnight before the production it was discovered that a 16-year-old Boy Messenger, A. Oldham, had a remarkable talent as a scenic artist. He designed and painted a palatial marble stage front, and his "Desert Island" scene, which formed the background of the third and fourth acts of the pantomime, was a beautiful piece of work. Three enthusiastic Traffic Officers built the stage, made the footlights, spotlights and curtain, and manipulated them during the performances. They achieved some very ambitious lighting and sound effects and it was a great testimony to their work that all the numerous effects occurred at the appropriate and precise psychological moments.

The three subsequent productions were equally successful, each one being more enthusiastically received. Altogether 1,300 tickets were sold.

The whole production was a revelation of remarkable and unsuspected talent. It is difficult to imagine how the high standard which has been set at the first attempt can be surpassed, but we hope that future years will see a succession of equally brilliant shows.

C.T.O. NOTES.

Promotions.—Mr. W. R. G. James, Overseer to Asst. superintendent; Mr. G. S. Richards, Telegraphist to Overseer; Mr. G. R. Hoghan, Telegraphist to Overseer; Miss E. L. Wilson, Asst. Supervisor to Supervisor.

Retirements.—Messrs. H. M. Robinson, Asst. Superintendent, F. J. Miller, Overseer, W. F. Lait and W. D. B. Samuel, Telegraphists, Misses E. A. Bolton and M. F. Phillips, Supervisors, E. A. Hibberd, Asst. Supervisor, and M. M. Goldspink and A. E. Wingfield, Telegraphists.

Obituary.—The death of Mr. Joseph Downing, in the 80th year of age, is the breaking of another link with the far-off days of the old Electric and International Telegraph Co. To Mrs. Downing and family we tender our sincere condolence.

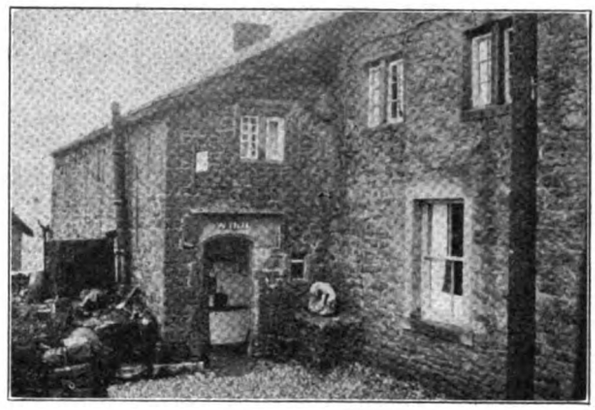
We regret to have to record the death of Mr. E. T. Chapman, a former Asst. Superintendent, and also the Rev. J. L. Howie, who, after being superannuated owing to ill-health, took office in the Catholic Apostolic Church, Dundee.

Special Section Dinner and Reunion.—A very happy gathering also well attended by retired officers assembled in the Queen's Room at the London Tavern and enjoyed a splendid dinner, followed by a musical programme.

"F" Division Reunion.—The Old Bell Restaurant was the happy rendezvous of the "F" Division dinner, which was well attended and thoroughly enjoyed.

LEEDS DISTRICT NOTES.

RAMBLERS among the beautiful Yorkshire Dales will find in the quaint old-world village of Airton a modern telephone exchange in a setting which is entirely in keeping with its surroundings.



As the photograph shows, the call office sign and the pole with its leading-in cable are in peculiar contrast to the date over the doorway, viz., 1666. To the right of the doorway is a strangely-shaped fossil found in the neighbourhood many years ago. The fossil stands on what was in olden days a mounting block, complete with step, for mounting and dismounting from horseback.

A pleasant function took place in Leeds on Feb. 22, when the local branch of the U.P.W. held their Annual Dinner. Invitations were extended to the Postmaster-Surveyor, the Asst. Postmaster, the District Manager and other departmental heads. Under the influence of a good dinner, eloquent oratory and the contribution of a first-class concert party, a most enjoyable evening was spent.

The establishment of rural automatic exchanges is so recent a feature of telephone activity that it was not surprising to find a large attendance, including many Traffic Officers, at the meeting of the local branch of the Institution of P.O. Electrical Engineers, to hear Mr. H. E. Francis, of the N.E. Engineering District, discourse on that subject. Mr. Francis dealt with rural automatic exchanges in the complete and lucid manner expected of one who has specialised in their installation throughout the district, and illustrated his points with several interesting lantern slides. The discussion which followed was indicative of the keen interest which both the subject and the speaker had aroused, and was specially noteworthy for contributions from Mr. T. B. Johnson (late Superintending Engineer) and Mr. G. S. Wallace (late Asst. S.E.).

We cull the following, with appreciation, from a recent issue of the *Yorkshire Evening Post*:—

"Long-distance telephony has been improved vastly in recent years, but so gradually that we are apt to lack appreciation. Nowadays one "gets through" to, say, London, Bristol or Manchester in quarter the time it used to take, and it is rare the line is not as good as on a local call.

"There are odd times, however, even now, when the telephone can be most exasperating, as an *Evening Post* reporter found to-day, and I just refer to the incident to pay tribute to the resource and initiative of an operator at the exchange.

"The call was to a well-known public man in the East Riding, who, by previous arrangement, had ready a rather important statement for publication in the *Evening Post*. Apparently he could hear all right, but his voice, as heard vaguely over the 'phone, was not of this world. 'Well, that's hopeless, isn't it?' said the operator, adding 'Wait on and I'll see what I can do.' Trying round about circuits was of no avail, and, finally, the operator went outside her official duties by offering to try and take down the statement herself, but unfortunately this proved impossible. It was the transmitter at the other end that was at fault.

"Anyhow, here's tribute to that 'Hello' girl for her efforts."

Our most interesting "Personal Call" to date was one completed from Ilkley to a passenger on board the S.S. *Viceroy of India*, which was berthed at Marseilles.

Sports Item.—Leeds Post Office Football Club.—In the second round of the Lancs and Yorks Football Cup, Leeds entertained Doncaster at Roundhay. After 29 minutes' play, when Leeds were two goals up and showing superiority in all departments, an unusual incident occurred. The ball burst on railings, and through an unfortunate oversight another ball was not available. The referee had no alternative to suspending play, and the match will be replayed on a date which has not yet been fixed.

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LONDON TELEPHONE SERVICE NOTES.

Contract Branch Notes.—The business done by the Contract Branch during the month of February resulted in a net gain of 4,378 stations, as compared with 5,013 stations in the corresponding month last year.

The decrease in net gain is largely due to an excess of ceasements this year, as the gross new business is practically the same this year as last year.

It is evident that conditions in the City have not yet recovered from the series of shocks recently experienced, and this is apparent from an examination of the results to hand.

The number of circuits provided this year in connexion with the British Industries Fair was 312. This figure is not so high as last year, but the number of Exhibitors was nearly 300 below the figure for 1929 owing to restricted accommodation during building alterations. The percentage of lines provided to Exhibitors was higher this year than last however.

Further progress is reported in the provision of kiosks. The number in use on Mar. 1, 1930, was 1,663, and there were Advice Notes outstanding for a further 140.

Obituary.—It is with regret that we record the death of Mr. G. C. Wood, Contract Officer, formerly attached to the City Contract Office, at the early age of 27. Mr. Wood had been in the Service only a short time. The funeral took place at Lewisham Cemetery on Mar. 3, and the office was represented by Mr. A. E. Culpin.

London Telephone Service Sports Association.—The Annual General Meeting will be held at Cornwall House at 5.30 p.m. on Monday, April 28. It is anticipated that a representative of the Civil Service Sports Council will attend the meeting.

Football Section.—Considerable progress has been made in the last few weeks concerning the destination of the League Championship. The match against the Ministry of Health "C" resulted in an overwhelming victory by 18 goals to 1, this materially improved our goal average, which was not so good as that of the team pressing us closely in the league.

The match with the Land Registry on Mar. 1 was, of course, the tit-bit of the season. Each club had forfeited only 3 points during the season, and a win for either team practically assured the destination of the championship.

The result, a 3-1 victory for L.T.S., was welcome, but the game was unfortunately marred by a sad accident to the Land Registry's goalkeeper, who was taken to hospital early in the game with a fractured leg. This handicap had no doubt much to do with the result of the game, and it was very distressing to both sets of players.

The game against Board of Education on Mar. 8 ended in a draw of 1 goal each.

The result was unexpected, and on the run of the play L.T.S. should have won comfortably.

Webdale and Casey, two of our players, played for the Civil Service League against the Postal League in a Charity match, and acquitted themselves creditably.

Bowls Section.—Members are reminded that the season opens at Chiswick on April 28, when a match between two teams selected by the Captain and Vice-Captain will be played. This opening game will be followed by an important league match against "Headquarters" on May 1. Headquarters are one of the promoted teams from Division "B," and they are able to turn out a very strong team. It is important, therefore, that we should get in as much practice as possible before May 1, as points won at the beginning of the season will be invaluable in our struggle to retain possession of the Bunbury Cup.

Ladies' Lawn Tennis Section.—*"Agnes Cox" Cup.*—Entries close on Saturday, April 5. The final will be played at Chiswick (C.S.S.C. Ground) on Saturday, Sept. 20.

"Pink" Cup Singles.—Open to all lady members of the L.T.S. Clubs. Entries close on Saturday, April 5. The dates of competitions will be announced as soon as the number of entries is known.

All entries and communications for both competitions should be forwarded to Miss Osler, Holborn Exchange.

London Telephonists' Society.—In the past the reading of the Prize Competition papers has always proved a popular item in the programme of the London Telephonists' Society, and the large and enthusiastic audience which assembled on Friday, Mar. 7, on the occasion of the Fifth Meeting of the 1929-30 session, showed that the item in question has lost none of its old attraction.

The proceedings opened with a novelty—an Elocution Competition—the test piece being Charles Kingsley's poem "The River," chosen on account of its known technical difficulties. By a series of eliminating trials the contestants had been reduced to six, Miss E. N. Braid (Richmond Exchange), Miss C. Francis (London Wall Exchange), Miss P. W. Gustine (Mill Hill Exchange), Miss M. C. Hawkridge (Gerrard Exchange), Miss G. S. Short (Flaxman Exchange) and Miss V. F.Wood (Buckhurst Exchange); these ladies competing in the presence of the judges and of the audience for the Society's Elocution Prize. The high standard maintained by all the competitors set the judges no light task. Mrs. Corner, in announcing Miss Francis as the winner, paid handsome tributes to the abilities of all the finalists—tributes which were heartily endorsed by the audience.

The subject of the Essay Competition, "A Day in My Official Life," provided excellent papers by Miss B. M. McDonald (Telephonists' Class), Miss D. Bott and Miss M. J. Clement (Supervisors' Class) and Mr. W. H. Pratt (other grades). A strong vein of humour ran through all the papers, to the manifest approval of the audience, which appreciated to the full the many sly "hits" at this or that mirth-provoking feature of our daily work.

The prizes were distributed by the Controller, who, in a happily -phrased and humorous speech, congratulated those present on their employment in a work which, on the testimony of the papers, seemed to provide not only interest but a never-ending source of joyous entertainment!

A hearty vote of thanks to the Controller and to Mrs. Corner—on the motion of Mr. Dive—brought to an end (except for the Telephone Play) Mr. Mantle's year of office, and a session which by common consent has been one of the most successful in the history of the Society.

As announced by Mr. Mantle, next year's President will be Mr. F. B. Nichols, of the Service Division.

Personalia.

Promotions to Assistant Supervisor, Class II.

Miss F. I Smith, of New Cross.	Miss W. G. Willis, of Hampstead.
„ A. Pattenden, of Hop.	„ E. Turnage, of Museum.
„ A. M. Jackson, of Langham.	„ D. S. Borrett, of Gerrard.
„ M. E. McCall, of Clerkenwell.	„ E. A. Hall, of Gerrard.
„ N. W. Crabb, of Chiswick.	„ A. V. Dyer, of London Wall.
„ V. B. Fensham, of Speedwell.	„ G. I Harber, of Victoria.

Resignations on Account of Marriage.

Assistant Supervisors, Class II.

Miss E. L. Fullelove, of Gerrard.

Telephonists.

Miss F. B. L. Cole, of Clerkenwell.	Miss A. M. Simpson, of Sidcup.
„ K. Cavender, of Erith.	„ Y. M. Brasier, of Toll "A."
„ J Matthews, of Greenwich.	„ D. M. Crick, of Victoria.
„ M. L. Kent, of Hop.	„ G. Cornford, of Trunks.
„ M. Perridge, of Kingston.	„ I. F. Day, of Temple Bar.
„ E. F. Mullinger, of Western.	„ M. C. Fisher, of Toll "B."
„ W. Walters, of New Cross.	„ E. H. Weller, of National.

NORTH-WESTERN DISTRICT.

RETIREMENT OF MISS E. SLATER.

A VERY enjoyable social evening was held at the Savoy Cafe, Burnley, on Jan. 31, to mark the retirement of Miss E. Slater, Supervisor, Burnley Exchange.

A company of 72 assembled, comprising telephonists who have served under Miss Slater, and representatives of the Postal, Engineering and Traffic Departments.

An hour's whist was followed by a conversazione and a presentation to Miss Slater. Mr. R. Morgan, Traffic Superintendent, was in the chair, supported by Mr. T. A. Cooley, the Head Postmaster, Burnley.

Mr. Morgan, in the course of an able performance of the duties of Chairman, voiced the feelings of the company in his expressions of appreciation of Miss Slater's personality and service.

When called upon to make the presentation of a portable gramophone, records, and record case, Mr. Cooley, in a humorous and appreciative speech, compared the gift with an automatic telephone, as the nearest approach thereto which could be obtained in Burnley. He also expressed a devout hope that the records presented to her would prove more enjoyable than the records with which she had dealt in the past.

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Despite his brief period of service in Burnley of six months, he had found Miss Slater an able and reliable supervisor, and endorsed the wishes already expressed for a long and comfortable retirement. Miss Slater responded in happy vein, and, expressing thanks for the gifts and kind wishes tendered to her, she spoke of the pleasure she had felt in the work and associations of the telephone service. Her dealings with the staffs whom she had had to control had been the source of much joy, and, carrying with her into retirement sentiments of affection from and towards the Burnley staff she hoped to have the pleasure of meeting them again.

Miss Slater entered the service of the National Telephone Company in 1896 at the old Accrington Exchange. She was then living on the exchange premises. Three operators were then employed there, two of whom were transferred elsewhere. On the day following their transfer relief failed to appear and the remaining one fell sick. Miss Slater, though not employed by the National Telephone Company, "took over," in consequence of which she was offered, and accepted, employment. Following severe illness she was obliged to use a bath chair continually for 12 years, and the company, retaining her services, allowed her to be carried into the switchroom and to be transferred from the bath chair to the switchboard. Fortunately, a remarkable operation resulted in almost complete restoration. During her service at Accrington she served in three exchanges there. On conversion to automatic working she was appointed Assistant Supervisor, Class II, and after the transfer of the manual work to Blackburn she was transferred to Burnley. Her period of 34 years' service has thus covered the changes from the "primitive" types of switchboard equipment to the most modern.

COMMUNICATION WITH OTHER PLANETS.

IT was either Sir W. H. Preece or Sir Oliver Lodge who, more than 30 years ago, envisaged communication between this earth and another planet.

Within the last few years attempts have been made to get into touch with Mars. In passing, it may be of interest to note that an old T.S.-ite was a most prominent figure on each occasion; although, of course, he might just as well have come from a class III office. A specially constructed set of 18 valves was used, which produced a repetition of the letter "M" in Morse.

The writer is intensely interested in scientific progress, and would therefore hesitate to criticise, especially if the Martians (assuming that they do exist) can render any assistance in solving the world's most urgent problems.

Although it is highly improbable that the millenium has arrived, we are given to understand that the civilisation of this hypothetical folk possibly dates back a million years or more. If it is actually so it is more than probable that telegraphy, telephony, telephotography and television, &c., as we know the systems, have been consigned to the Martian equivalent of Farringdon Road junk market many many decades ago and their functioning entirely forgotten—did they ever function at all!

On this earth variety is the spice of life, and no two things are exactly alike; so that to presume that the inhabitants of another planet use, or have used, identical instruments of communication—let alone a similar Morse alphabet—is surely stretching the imagination too far.

Again, why the Martians should transmit the letter "M" passes my comprehension. Their planet might, to them, be known as XYZ for all we are aware. Their intelligence is presumed to be of a very high order, and one does not suppose that they are prepared to name the sphere on which they live to suit the purpose of such inferior beings as ourselves. I do not mean nations or individuals. It must be remembered that we are referring to two planets, each as a whole.

It might be said that, by reason of their more advanced knowledge, the Martians are possibly aware of our efforts to "raise" them. In fact, the writer offers the supposition that they might even be watching our everyday movements, and discussing this world's latest news. Should that actually be a fact, then the people of the red planet know us better than we know ourselves.

Our most up-to-date apparatus, however, would probably be as "old as Adam" compared with that in use on Mars, or, what is more likely, never used at all. Our most modern ideas would be too crude for them to adopt. In any case, if they had a knowledge of the Morse code, surely a great opportunity of making our acquaintance, by limiting their signals to a single letter, was lost.

But perhaps the acquaintance is not desired. Who knows?

There is, however, an instrument which, even though not in use on Mars, may pave the way to opening up enormous possibilities.

It is a phantasy, but in conjunction with telescopes, and valves which project rays at the same speed as those of light (this latter is very near accomplishment), the noctovisor should provide a basis upon which confirmation or refutation of scientific conjecture can be decided.

W. T. L. (C.T.O.).

RETIREMENT OF MR. H. G. McFARLANE, DISTRICT MANAGER, MIDDLESBROUGH.

MEMBERS of all sections assembled at the Middlesbrough District Telephone Office on Feb. 28 to bid farewell to Mr. H. G. McFarlane, the District Manager, who, owing to his reaching the age limit, retired from the Service on Mar. 2, and to present to him a mahogany telescopic dining table with table runner.

The chair was taken by Mr. R. C. Rae, Contract Manager, who spoke in high esteem of Mr. McFarlane and described him as a chief who possessed a "happy knack" of obtaining the highest co-operation amongst all ranks under his control, and whose work reflected in the steady and satisfactory progress which had been made in the development of the Middlesbrough Telephone District.

The gift was presented, on behalf of all Mr. McFarlane's official associates in the Middlesbrough Telephone District, by Mr. A. Burdett, Chief Clerk.

Tributes to Mr. McFarlane's services were paid by Mr. W. J. Cabeldu, the Head Postmaster of Middlesbrough, and Mr. S. B. Townsend, who represented Mr. J. I. Smith, the Sectional Engineer, owing to the latter's unfortunate absence on sick leave. A letter, in high appreciation of Mr. McFarlane, from the Traffic Superintendent, Mr. Bateman (who at the time was absent on leave preparatory to returning to his former district—the Western) was read by Mr. Rae. Members of other sections also extended to Mr. McFarlane their good wishes for his continued enjoyment of good health and prosperity during his well-earned rest.

Mr. McFarlane, in responding, thanked the staff for their kind expressions of esteem, and after giving an interesting account of his experiences in telephone work, which began with the National Telephone Company some 46 years ago, paid tributes to the loyalty he had received from his own staff and to the hearty co-operation from all other sections of the service.

The District Managers of Great Britain and Northern Ireland have very kindly presented Mr. McFarlane with a cheque which has gone towards the purchase of a wireless set.

Mr. McFarlane will shortly leave Middlesbrough and take up residence in Aberdeen.

LONDON TELEPHONE SERVICE: POST OFFICE AMBULANCE CENTRE.

AN interesting event took place in the Refreshment Club at Cornwall House on Wednesday evening, Feb. 26. It was the occasion of the distribution of some of the awards gained by the London Telephone Service Branch of the Post Office Ambulance Centre, when some 50 certificates, vouchers, medallions and labels were presented to the various successful members, together with eight gold medals won by the London Telephone Service men's and women's teams which competed in the annual competitions.

The presentation was made by Mr. Viant, the Assistant Postmaster-General, and the Controller, Mr. Napier, was in the Chair, supported by the heads of the various departments. In his introductory remarks the Controller read a letter from the Postmaster-General, who, while congratulating the London Telephone Service on its successes, regretted his inability to be present owing to the pressure of Parliamentary duties. The Controller expressed his appreciation of the work done, and mentioned the value of quick and ready assistance in cases of need.

Mr. Viant, in replying to the vote of thanks given by Mr. Pink, Deputy Controller, and seconded by Mr. Dive, Assistant Controller, Traffic Branch, stated the pleasure he had in making the presentations, but warned the London Telephone Service that, having so distinguished itself, it will have to make greater efforts to retain its position, because sustained defence requires more effort than attack.

The meeting was very representative of the various branches and about 250 members of the staff and friends were present.

(Signed) S. J. SMITH,
Hon. Secretary, L.T.S. Branch, P.O. Ambulance Centre.

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A BRIEF CHRONOLOGY FOR STUDENTS OF TELEGRAPHS, TELEPHONES AND POSTS.

BY HARRY G. SELLARS.

(*Continued from page* 104.)

1892, Sept. 1... Coast Communication System and connexions with Lighthouses and Lightships (by telephone or telegraph) inaugurated.

Free delivery of telegrams for outlying parts of large provincial towns granted.

Various telephone companies in the United Kingdom amalgamated.

F. C. Allsop published an exhaustive treatise on telephonic matters.

1892, Nov. 3 ... Strowger's Automatic telephone system tried at Laporte, Indiana.

British Treasury agreed to free re-direction of *letters* only.

Stamped letter cards introduced.

1892, Dec. 1 ... Limits of compensation for registered letters and parcels raised to £50. Tariff ranged from 2*d*. for £5 to 11*d*. for £50.

Ernst Werner von Siemens died.

Free telegram facilities previously enjoyed by railway companies substituted by the right to send a fixed number of telegrams containing a fixed number of words.

1893, Jan. ... Hughes duplex telegraph installed between London and Paris and Rotterdam.

Syndicate formed by H. S. J. Booth to work patents for the telephonic transmission of theatrical and other performances.

Telephones in Austria taken over by the State.

L. B. Marks introduced enclosed electric arc lamps.

J. J. O'Connell suggested electric lamps for signalling purposes in connexion with telephone systems.

1893, April 5... Glasgow-Belfast telephone communication opened for public use. Submarine cable running from Port Patrick to Donaghadee.

1893, July 4 ... S. P. Thompson patented a method of sectional and continuous "loading" for telegraph and telephone cables.

1893, July 24... Special delivery of Inland packets arriving by a particular mail arranged.

McCaskey patented a means of adopting a starting impulse in telegraph multiplex distributors.

Henniker Heaton quoted the capital of Submarine Telegraph Companies as £40,000,000; miles of cable, 120,000; revenue, including subsidies, £3,204,060; reserves and sinking funds, £3,610,000; and dividends ranging from one to 14¾%.

Eastern and South African Company subsidised (£28,000 per annum for 20 years) by the British Government for a cable from Zanzibar to Mauritius via Seychelles.

1893, Dec. ... Annual limit of deposit in Post Office Savings Bank raised to £50. Deposits could be withdrawn by telegraph on payment of appropriate charges.

J. S. Stone invented a common-battery system for telephone working.

Nikola Tesla proposed to transmit electrical oscillations to any distance through space.

1894, Jan. 1 ... Heinrich Rudolf Hertz died at Bonn.

1894, Jan. 2 ... Romaine Callender, of Canada, patented an automatic telephone system.

1894, Feb. ... Insured parcels exchanged with certain European countries for the first time. Tariff ranging from 5*d*. for £12 up to 1*s*. 3*d*. for £50.

J. and C. J. Erikson developed an automatic telephone system which was installed at La Porte, Indiana. Three lines were necessary for each subscriber.

Sir Oliver Lodge demonstrated that the conductivity of iron filings in a glass tube increased when acted upon by electric radiation. He called the tube he devised a "coherer."

(Muirhead, Ducretet, Popoff, Castelli, Tommasina, Branly, Righi, Blake, and S. R. Bottone also designed wireless "coherers.")

Eric Rathenau, Rubens, and Strecker also made investigations in wireless phenomena.

Syndicate formed in 1893 for transmission of theatrical performances became the Electrophone Limited.

1894, July 12 Electric Units Bill, legalising electric standards, passed U.S.A. Congress.

Scale of insurance fixed for foreign parcels in February was extended to British Colonies.

1894, Aug. ... Postmaster-General (Arnold Morley) submitted to the House of Commons a draft agreement for the purchase of the telephone trunk lines.

"Morley" revision of pay, &c., in the Post Office took place.

1894, Sept. 8... Hermann von Helmholtz died.

Intercolonial Postal Conference met at Ottawa and Canadian Government invited tenders for construction of Canada-Australia cable.

Atlantic cable laid for Commercial Cable Company.

Terrin, of France, devised a telegraph keyboard perforator, with a differential feed, in which six white and five black keys were arranged in piano style. It worked well in connexion with the Marseilles-Algiers cables.

Abbé L. Michel found that he could transmit signals for short distances by using various strata of the earth as the outward and return paths of the current.

Number of Inland Telegraph Money Orders issued, 78,000, value £277,000.

1895, Jan. 1 ... Treasury sanctioned the free re-direction of all postal packets except parcels. Official re-direction undertaken for a period of twelve months.

Postal Union limit of compensation for foreign and colonial parcels adopted, viz., parcels up to 7 lbs., 12*s*.; over 7 and under 11 lbs., 20*s*.

Marconi passed wireless signals from one room to another at Pontecchio, near Bologna.

Murray automatic typeprinting telegraph invented.

Mercadier invented a Harmonic multiplex system of telegraphy.

1895, Mar. 1 ... Draft Telephone Agreement referred to a Select Committee to consider whether the provisions made for local services were adequate.

1895, Mar. 19 First meeting of Telephone Select Committee held, Arnold Morley as Chairman.

Mark A. Edison, of Chicago, invented the "knife-edge" relay for telephone signalling lamps.

Popoff, in St. Petersburg, experimented in wireless communication.

1895, May 8 ... Walking distance for messenger in Express Delivery Service extended from 2 to 3 miles.

1895, June 12 Trunk telephone lines erected by the Post Office opened by the Lord Mayor of London in the Cable Room, General Post Office, London. He spoke with municipal representatives in Glasgow, Edinburgh, Belfast, and Dublin.

1895, June 19 Apostoloff, of Russia, patented an automatic telephone system.

1895, June 25 Telephone Select Committee reported the evidence they had taken and recommended that a committee be appointed in the next session to continue the work.

1895, July 16 Post Office trunk telephone system opened to the public.

1895, Aug. 1 ... Compensation up to £2 payable on any article sent by express letter service. Number of registered letters about 12,000,000.

1895, Aug. 20 Express Delivery Service accepted living animals and liquids for "throughout" delivery.

Wireless communication established between Crookhaven Post Office and Fastnet Lighthouse by a system introduced by Willoughby Smith.

Wireless telegraphy used between island of Mull and the mainland.

Profits on Post Office Savings Bank since commencement totalled £1,598,767.

78,839,600 telegrams dealt with in the United Kingdom.

60,000,000 parcels passed through the Post Office.

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	Siemens and Halske introduced a governor for the Hughes with flat leaf spring suspensions on which are fixed two balls which can be raised or lowered as desired.
1896, Jan. 1 ...	Trunk telephone call tariff ranged from 3*d.* for 25 miles to 1*s.* for 100 miles.
	Fernand Ducretet demonstrated röntgen rays to French Academy of Sciences.
1896, Feb. ...	New Post Office life insurance tables came into operation with reduced annual rates.
1896, Mar. 25	Detailed agreement between Postmaster-General and National Telephone Company *ré* sale of trunk telephone lines signed. About 29,000 miles of wire taken over.
1896, April 4 ...	33 telephone trunk lines transferred from the National Telephone Company to the Post Office.
	Telephone cables containing over 150 pairs of wires produced.
1896, June ...	Common battery system brought into use at Worcester, Massachusetts, telephone exchange.
1896, June 2 ...	Guglielmo Marconi took out a patent for wireless telegraphy and transmitted signals for a distance of nearly two miles.
	Rutherford and Rev. F. Jervis-Smith constructed detectors for wireless communication.
	Joseph Chamberlain appointed Royal Commission (Chairman, Lord Selborne) to discuss Canada-Australia Cable. Reported in favour of All-British route to Australia via the Pacific. Admiralty reported against it.
1896, Aug. 14	Government authorised to raise further £300,000 for trunk telephone wire purposes.
	Post Office permitted Marconi to experiment on Salisbury Plain and in other places with wireless apparatus.
	F. G. Creed arrived in Scotland from South America with his newly invented typewriter keyboard perforator.
	Gibson invented a differential stop device in connexion with the paper feed of keyboard tape perforators.
	Lebedew devised a method of controlling the speed of a motor in which acceleration of the motor puts in resistance.
	Direct West India Cable Company obtained a subsidy (£9,000 per annum for 20 years) from the British Government for a cable between Bermuda and Jamaica.
	S. A. Pollock applied the duplex balance to the Delany multiplex using the reed driving arrangement suggested by Law in 1888.
	International Telegraph Conference in Budapest. Fifteen letters adopted as the limit for one word in plain language.
	Compagnie International des Wagons-lits proposed a mail service via Siberia to Vladivostock. Not supported by British Government.
	Number of letters passing through the Post Office, 1,796,000,000.
	Value of property found in letters opened in the Returned Letter Office amounted to £580,000.
	9,000,000 Money Orders issued.
1897, Jan. 5 ...	Report of the Imperial Pacific Cable Committee signed. State ownership was recommended and a route proposed.
1897, Feb. 1 ...	Money Order rates changed to 3*d.* for £3 and 4*d.* for £10. Rates for Colonial and Foreign Money Orders reduced to a scale ranging from 6*d.* for £2 to 1*s.* 6*d.* for £10.
	Poundage for telegraph Money Orders reduced to 4*d.* for £3 and 6*d.* for £10.
	Compulsory registration of letters found to contain coin, jewellery, or watches reduced to fourpence. Packets found open, or opened at the Returned Letter Office, containing articles of value, other than those quoted above, compulsorily registered at a fee of 2*d.*
1897, Feb. 6 ...	Transfer of telephone trunk lines from the National Telephone Company to the Post Office completed.
	Hughes duplex telegraph installed on London wires to Berlin and Hamburg.
	Walther Nernst studied the origin of electric currents, and invented an electric lamp.
	In response to public complaints Money Order rates reduced to a scale from 2*d.* for £1 to 4*d.* for £10.
1897, June 1 ...	Postage rates on parcels reduced. Tariff ranging from 3*d.* for 1 lb. to 1*s.* for 11 lb.

(To be continued.)

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THE

Telegraph and Telephone Journal.

VOL. XVI. MAY, 1930. No. 182.

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TELEGRAPH AND TELEPHONE MEN AND WOMEN.

LXXV.

MR. T. A. BATES.

MR. BATES was born in a Lancashire vicarage in Dec., 1869. An old Uppinghamian, he subsequently passed through the shops of S.Z. de Ferranti in Charterhouse Square, London, and thence to the staff of the London Electric Supply Corporation.

In November, 1891, he accepted an offer from the Northern District of the late N. T. Co. and after a few months became Assistant Local Manager at South Shields. A year or two later he was appointed Local Manager at Middlesbrough, and after a brief stay there was selected for pioneer work to build up a telephone service where hitherto none had existed, viz., the Channel Islands. The Isle of Wight, the development of which had more than once been attempted without success, was his next post.

In February, 1901, he was appointed District Manager at Luton, but was no sooner married and house set up than a further call came, and the next four years were spent fighting, at Portsmouth, the keenest Municipal competition in the country. Then followed periods of charge at Chester, Scotland S.W., and Bristol, prior to his present appointment to the Leeds District in November, 1921, where he has spent some of the happiest years of a telephone career.

Mr. Bates, whose tact and unfailing courtesy in all circumstances are proverbial with those who have any dealings with him, finds his recreations in wireless and music, and, when opportunity offers, in tasting the salt sea air while handling the tiller of a sailing boat.

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THE TELEPRINTER.

A. P. OGILVIE (*Headquarters Traffic Section*).

(*Continued from page* 128.)

(VI.)

THE rapid development of the tape Teleprinter has to some extent overshadowed the parallel development of Teleprinters arranged for column printing. Early trials with the latter type of machine on circuits carrying ordinary commercial and social traffic did not yield results sufficiently convincing to warrant the adoption of column printing in preference to tape printing, and so, within recent years, attention has been concentrated on Teleprinters No. 3A.

Column printers are essentially more complicated than tape printers. Instead of a simple revolving tape-printing platen it is necessary to provide somewhat more elaborate arrangements for controlling the movements of a paper carriage similar to that of a typewriter. Prime and maintenance costs are higher. Operating is not so simple and straightforward, the number of "column" and "carriage-return" signals required to set out a telegram in an attractive display at the receiving station being disproportionate as compared with the number of equivalent signals necessary in tape printing. Neither is the appearance of the completed message impressive in some cases, and as all telegrams are printed on the same continuous paper roll, the facility is lost of using distinctive forms for special services. Another weakness is the absence of an invisible correction of errors; operating mistakes and corrections are reproduced on the printed copy and entail the repetition of imperfectly printed telegrams. It is also necessary for traffic convenience at duplex to construct the transmitter and receiver in two separate units.

While these limitations prejudice the use of the column Teleprinter on commercial circuits, there is a definite field in which it possesses undoubted advantages. For press traffic and for certain forms of private wire work a copy delivered complete from the printer is much more convenient than a printed tape which has to be gummed to a form. The Central News Agency has, for example, successfully exploited column Teleprinters for the distribution of news over a wide area, and their experience is of considerable value. In dealing with press work, the British Post Office has hitherto remained faithful to the Wheatstone system, but the established claims of the Teleprinter are now being considered. Two YQ news circuits from the Central Telegraph Office to Birmingham, Manchester, and Liverpool, previously equipped with Wheatstone Creed apparatus, have been converted to Teleprinter working. On each circuit a transmitter unit (Teleprinter No. 5A) is installed at the Central Telegraph Office and a column printer unit (Teleprinter No. 4A) is fitted at each of the receiving offices. One or more of the receiving offices may be called into circuit at will, as in Wheatstone YQ working, and in the case of an item for several stations simultaneous reception is available. As the Central Telegraph Office copy is transmitted direct to line from the keyboard, no perforated slip is employed. In the reverse direction acknowledgments are transmitted by Morse key. The system has yielded excellent results. Hourly totals of from 20 to 30 pages of press of a varied description are being dealt with regularly, and the stability of the circuit and apparatus is satisfactory. It will be recognised that many of the drawbacks of column printing experienced in dealing with commercial telegrams do not apply, or have little weight, on press traffic circuits. Fortunately, the amount of multiple address work received at any one station is small, and the single copy printed is ready for delivery after scrutiny. The question of a ready means for manifolding copies is, however, being considered in case of future need.

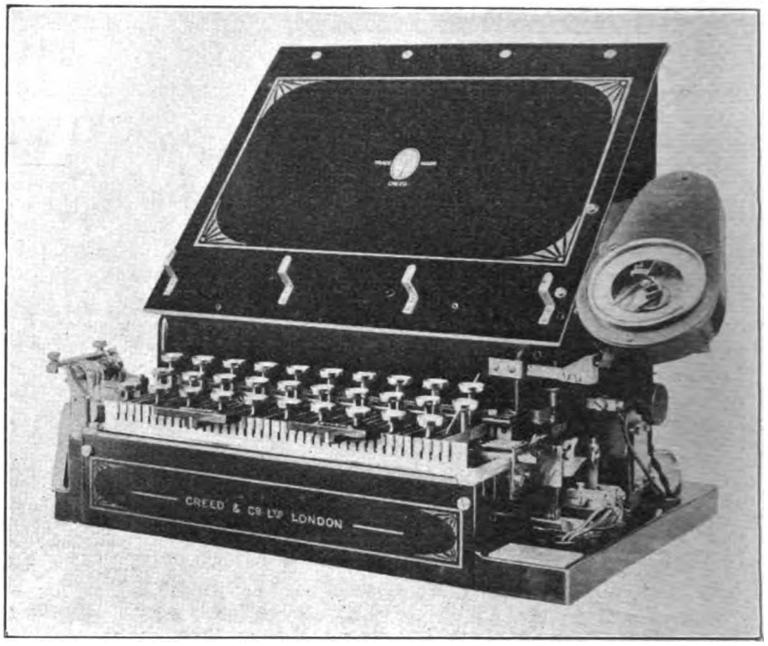

FIG. 19.

Fig. 19 is an illustration of the transmitter unit. The selecting and transmitting mechanism is similar in principle to that of the Teleprinter No. 3A although it is arranged differently. A separate motor is employed. The distinctive features of the keyboard are, of course, those necessary for the operation of the distant column printer. Prominent is the letter counter on the right of the unit. The depression of a key drives a pointer one unit round the letter counter dial until a sufficient number of characters has been transmitted to almost fill a line of print on the distant copy. A warning lamp behind the keyboard is then lighted and the pointer indicates the number of letters it is still possible to transmit without overprinting. The depression of the line-page key (see Fig. 20) restores the pointer to zero, extinguishes the lamp, and at the same time signals a combination to line which moves the receiver copy up one line and returns the carriage to the beginning of a fresh line. The "column" key is used when it is desired to move the paper upwards without returning the carriage to the left margin. A perforating unit is embodied in the machine shown in Fig. 19 which permits of the keyboard being employed as a five-unit perforator. This part has been detached from Post Office apparatus and is, it is understood, being redesigned.

FIVE – UNIT KEYBOARD.

(BRITISH POST OFFICE STANDARD)

FOR USE WITH PAGE PRINTERS.

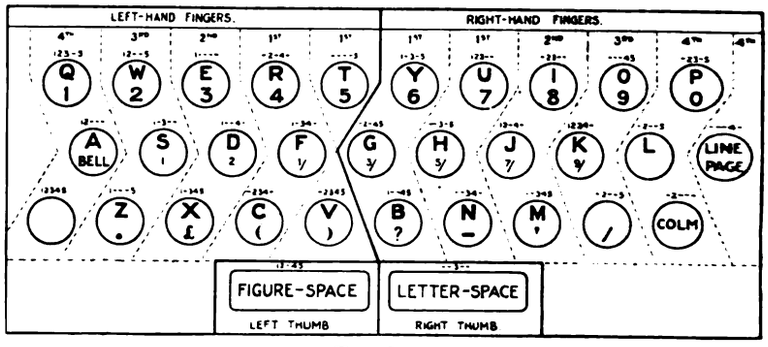

FIG. 20.

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The column printer unit, Teleprinter No. 4A, is shown at Fig. 21. As in the case of the transmitter unit the printer action is similar to that of the Teleprinter No. 3A, the different lay-out of the parts being determined by the positioning of the more elaborate paper carriage mechanism and the altered printing position. The motor is accommodated underneath the unit.

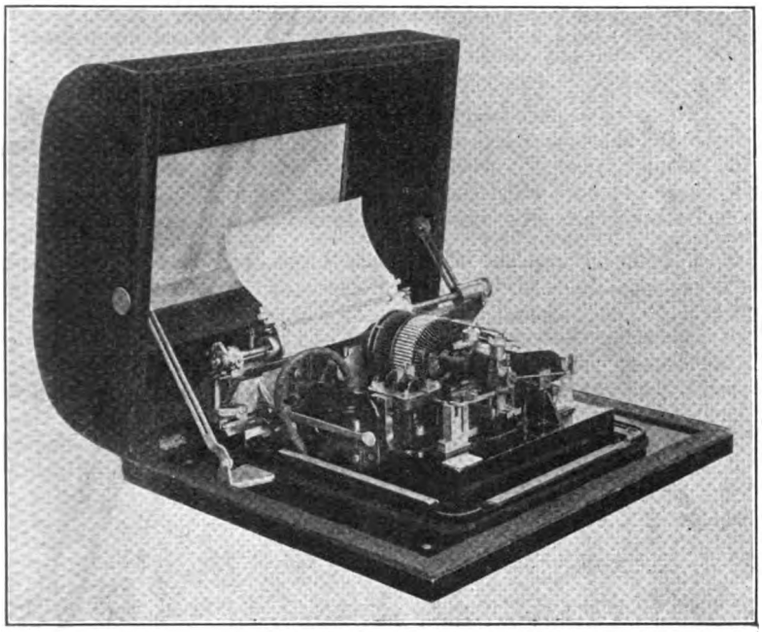

FIG. 21.

While direct keyboard transmission at a maximum speed of 60 words a minute appears to meet satisfactorily the present traffic conditions, it may be desirable ultimately to exploit a system of automatic transmission and reperforation at a higher speed. Appropriate units are available for the purpose should the need arise to use them.

In concluding these notes I may, perhaps, be allowed a personal reference. It has been difficult to avoid being prolix in attempting to describe, in popular terms, mechanism and methods of a technical nature, but the evidence I have received of widespread interest and enthusiasm has encouraged me to continue. It is not too much to claim that the advent of the Teleprinter has brought new life into the senior service and may in time revolutionise our conception of Telegraphy.

[THE END.]

MR. PEARSON KNOWLES, YORK DISTRICT.

MR. PEARSON KNOWLES who has been promoted to Contract Officer, Class I, Birmingham, was the recipient of a handsome present—case of Sheffield stainless cutlery and fountain pen—on Mar. 29, when members of the District Manager's Staff assembled to bid him farewell. Mr. F. E. Adams, in making the presentation, assured Mr. Knowles that he left York with the good wishes and congratulations of all the staff on his well-deserved promotion. Representatives of the various sections also paid tribute to Mr. Knowles.

In thanking the staff for their tangible expression of goodwill, Mr. Knowles said that the few years during which he had been in the York District had been very happy ones, and in many ways he regretted his departure.

DEVELOPMENTS IN MACHINE TELEGRAPH SYSTEMS AND METHODS OF OPERATION.

THE above was the title of a paper by H. H. Harrison, M.I.E.E., which this well-known telegraph and telephone engineer read before the Institution of Electrical Engineers in London on Mar. 27 last, at which gathering the writer of these few lines was an interested and privileged listener. The paper itself is the result of two years intensive collation and segregation and printed, contains no less than one hundred and thirty-nine illustrations. As one of the commentators subsequently stated, this last effort of Mr. Harrison's will no doubt be considered as a classic in the field of machine telegraphy. Divided into eight sections the headings of each one of these in themselves suggest sufficient material for as many separate evenings for useful discussion. Thus, for example, (1) *Speed and phase control*, with local and main-line synchronism, phase swing. Motor speed control; classification of motors. Governors, Baudot, D.M.O., electro-mechanical, tuning-fork, phonic wheel, clock control of fork or reed vibration, gang-control and inter-office speed control.

Phase control.—Baudot's method, Picard's Baudot epi-cyclic correction gear, Rothermel's corrector, Creed's mechanism, Wood's corrector, Toll and Muirhead's corrector. Omitting much from the contents of Section number one let us pass to No. 2, which deals with *Transmitters or composing machines*, and deals with Siemens transmitters and alternatives, all-electric keyboard transmitter, tape-controlled transmitter, Wheatstone and 5-unit code transmitters, Baudot's, Morkrum's, Cardwell's and Potts' transmitters, single-revolution clutches, start-stop transmitters, sending distributors, over-lap on keyboards, &c., &c.

Section 5, on *Regenerative Repeaters*, together with the very specially informed comments by Mr. Wood, of the Eastern Telegraph Company, was particularly instructive as to the labour-saving effects of the most modern developments of the telegraph industry, and the gradual reduction of telegraph operators, at times to their almost complete supersession by one or two young engineers.

It was interesting to learn that Mr. Harrison agrees that regenerative repeaters are, after all, "due to modern adaptations of the regenerative repeater invented by Baudot."

Mr. Harrison laid down the following dicta, which should prove more than ordinarily significant at the present moment, when the staff of our Inland Telegraphs is quite naturally passing through an anxious cross-examination of events and policies as to the effect of this, apparently, sudden rush of machine telegraphy developments. The lecturer, speaking of the proposed supersession of multiplex by single channel working, said that in the first case this was simply an account of "the perfection of the single-channel start-stop telegraph machine, and (2) the co-ordination of the line plant," but maintained, nevertheless, that if all the inland multiplex apparatus were scrapped to-morrow and equivalent channels obtained by single-channel start-stop apparatus, the problem of making telegraphy pay would still be there.

In view of the present effort on the part of the Post Office administration to investigate the potentialities of a telegraph exchange, the undeniable assertion that the principal factor in operating costs is that of re-transmission, this latter opinion is especially engaging.

Mr. T. E. Herbert opened the discussion with the apposite remark that "it was worthy of note that the period of adversity through which telegraphy had been passing had coincided with *an amount of progress unparalleled* during any corresponding period of the history of the art." Mr. F. G. Creed aptly pointed out that the British Post Office had to contend with conditions that did not exist in the U.S.A. He referred to the work of Donald Murray in the development of machine telegraphy and added that as regards international communication the absence of an international

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language was a handicap. The written message was frequently to be preferred to the spoken word. Lieut.-Col. A. G. Lee remarked that *valve*-maintained tuning fork methods were used in controlling the frequency of the Government radio-telegraph station at Rugby, and hinted at other experiments which were being carried out in order to assure exactitude and to increase the working value of existing lines for telegraphy with teleprinters. Mr. K. L. Wood asserted that by means of the gang control of motors, synchronisation in the Eastern Company had been brought to so fine a point that changing speed and restarting traffic in 0.5 minute was a *routine* operation.

One was pleased to hear that the "Cook" Baudot governor, submitted as far back as 1926 to the British Post Office, was again being tried on certain international circuits.

Mr. Harrison promised studied replies to a couple of queries raised, but truth to tell, so fruitful was the discussion there was little enough time in which to do more than acknowledge the comments and criticisms of an interested and sympathetic audience. Few of the lecturer's listeners knew that he had returned from Düsseldorf that very morning on purpose to keep his engagement, and was due in Germany again during the next twenty-four hours!

J. J. T.

LIGHT FROM MANILA.

IN places far removed from the common round and the beaten path we may at times chance upon profitable and refreshing reading which, like the stories in the "Arabian Nights," "serves for instruction and warning to whoso shall read them." I may instance the *Post and Telegraph Review* of Manila, a "scientific and literary magazine published every month for the furtherance of the interests of the Bureau of Posts, and devoted to the moral and intellectual advancement of employees." This is a journal which must be seen to be believed and read from cover to cover to be adequately savoured. To the postal neophyte of the Philippines it furnishes instruction in official matters, in history, and in science; it regales him with news, with poetry, and with humour, and affords him also social and moral guidance. To the citizen of the world as also to the insular Briton it is not without its message. At this distance away in London I am able to learn from it what I did not know before, to wit: the Nine Wonders of the British Business World. They are (1) the Midland Bank; (2) the Stock Exchange; (3) Lloyd's; (4) the *Daily Mail*; (5) Despatching Room of the Midland Railroad at Derby; (6) Shipyards at Glasgow, Newcastle, and Belfast; (7) Carrera's Factory; (8) Cadbury Factory; (9) Underground Station at Piccadilly. I feel that they might have found room in the sacred nine for the London Trunk Exchange, or (since the recreation and hygiene of staff are a feature of modern business efficiency) that celebrated open-air bath where a green costume is held to be immodest and a black, though scantier one, decorous. But rejection is the mother of selection, as the proverb ought to say, and all works of inclusion and exclusion are extremely thorny and delicate.

News is gathered from all sources. It is interesting to learn *via* a Burmese paper that a postman at Barnet got £50 damages for a dog-bite. Medical articles inculcate a proper care of health. Dr. Morgan tells us that "hands cause infection," Dr. Lulu Peters recommends plenty of milk, while from Prof. Uginelli we learn that women are one-tenth less susceptible to pain than men, "that in the skin territories of the body the outer arm is far the toughtest. This thoughness can be explained by centuries of wear and tear to which the arms have been subjected in maintaining defences." Moral reserves are strengthened by twelve hints to postmen, warning them not to be "clock-watchers" and to avoid the spirit of "I don't give a damn," and by an exordium on loyalty. Frivolous clippings from American journals are more than counterbalanced by pithy apophthegms by Plato, Bernard Shaw, Descartes, Beaumont and Fletcher, Disraeli, and Turganiev. You can turn from a report of the Postal Congress in London or from the Five Fundamental Bases of American Prosperity to a succinct article on Science through the Ages, or better still to the poetry of "Young Fat" Regoberto A. Aguirre (for so he is affectionately described). This is his "Vesper Song":—

> Mellow and sweet are the prevailing rays in floral way,
> Where found the blooming flowers with grand fantastic array.
> In rapture they open their petals in frolic dance,
> And suffused with perfume the ambient air around my manse;
> The advent of the dew do thrill the young buds in delight,
> And joyfully my lonely soul has drunk the beautiful sight.

There is no space to quote the "chorous." Suffice it to say that it exhibits the same freedom of metre as the foregoing, and contrives to rhyme "flower" with "forever." But to achieve English rhyme of any sort when English is not one's mother-tongue is a feat which commands my unfeigned admiration and amazement.

Passing by reports of new Air Lines, new picture telegraph services, and lives of Edison, I linger with unbounded delight on Miss Holt on "Social Etiquette." The elaborate provision she prescribes for the care and comfort of the chaperone to the lady who honours us with her company at a dance, and the rites connected with introductions and programmes, carry the mind back to days when, if life was not ampler, one's partners were—or at least they did not seek to suppress those distinctive and disturbing curves which the present rage for slimness proscribes. I offer the following hints, culled from this article, to the numerous organisers of staff dances in the service:—

> "The members of committees are obligated, furthermore, to escort the patronesses to the supper room, to introduce guests of importance to them and to accompany each lady who serves in this capacity to her carriage door when she rises to depart. If the balls opens with a grand march, the matrons who assist in receiving are led out on the floor and through the mazes of the promenade, each leaning upon the right arm of some prominent member of one or another of the different committees in charge."

In this year of grace, I feel sure that I have not reproduced these directions to no purpose.

W. H. G.

OBITUARY.

IT is with profound regret that we announce the death of Mr. A. L. May, Traffic Superintendent, Class I, Southampton, on the night of Mar. 19.

His passing was indeed tragic, for he succumbed to a heart attack in the street while walking home alone after a visit to the doctor. There was a severe snowstorm at the time.

Mr. May would have been 51 years of age in May next. He was very widely known and had experience in many parts of the country. He joined the National Telephone Company in 1899 and when that organisation was taken over by the Post Office in January, 1912, he held the position of Traffic Superintendent at Bradford. He was later transferred to Nottingham, and in 1922 he was promoted to Blackburn. After a short period at Gloucester, he was transferred to Southampton in April, 1926.

His stay in Southampton was a very happy one and his removal to the south seemed to result in much improved health. His cordial, genial disposition endeared him to all with whom he came into contact, not only those in his own branch but also the head postmasters and engineering officers. He was an enthusiastic worker and was particularly happy in imparting his knowledge and experience to the junior members of the staff.

The interment took place in Birmingham on Mar. 24, and was attended by Mr. O. G. Lee, District Manager, and Mr. H. R. C. Hickish, Asst. Traffic Supt. representing the Southampton district, and Mr. H. Bristow, Head Postmaster, Winchester, representing the head postmasters, and many of his friends and colleagues in Birmingham.

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TRANSATLANTIC TELEPHONY.

(Abstract of an Address by Lt.-Col. A. G. LEE, O.B.E., M.C., M.I.E.E. (Asst. Engineer-in-Chief, G.P.O.) at a Meeting of the Post Office Telephone & Telegraph Society).

THE first transatlantic circuit was opened in January, 1927, on what is known as the long-wave 5,000 metres. Since that date we have opened three short-wave circuits with three waves each, one in June, 1928, another in June, 1929, and a third in December, 1929. The short-wave lengths used are of the order of 32 metres, 24 metres, and 16 metres. They are used at different times of the day in order to overcome the difficulty of fading.

We find that the long wavelength gives the most solid and reliable communication, except during or about the sunset period each day. The short waves can be made effective over the greater portion of the day by changing from one wavelength to another, but they are liable to disturbances from magnetic storms. The long wave, therefore, while being far more expensive than the short wave, is a much more reliable circuit, and we could not give a completely satisfactory service unless we had it. The long-wave and short-wave circuits are dealt with separately, as the principles are different.

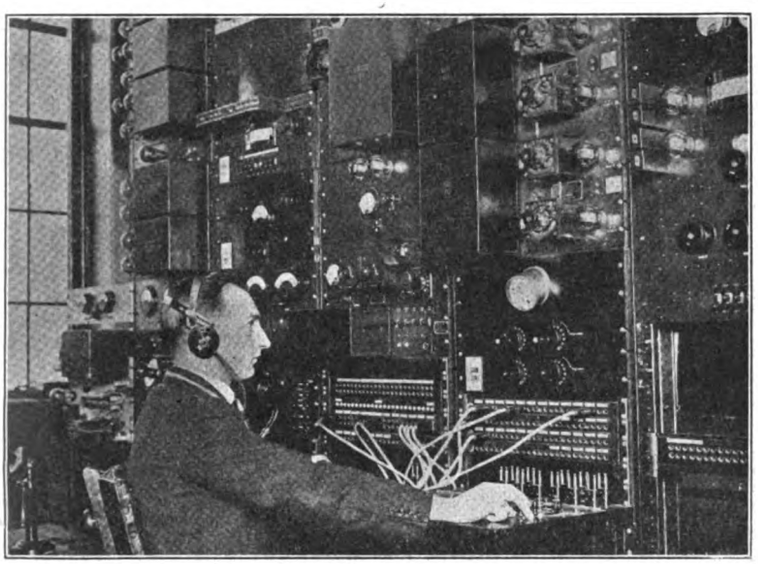

FIG. 1.—TECHNICAL OPERATOR'S POSITION, TRUNK EXCHANGE, LONDON.

Fig. 1 is the technical operator's position, which is situated in the Trunk Exchange, London. The necessity for this position arises from several causes, the principal of which is that the output of a transmitter at Rugby is a certain limited quantity, and in order to load it up to its full output on each wave, it is necessary that the technical operator shall adjust the amount of amplification on each subscriber's talk, so that the talk going out to Rugby can fully load the transmitter. He also controls the amplification at different points of the circuit, which requires adjustment from time to time to allow for changing radio conditions. One of the pieces of apparatus on the technical operator's position is known as the Voice-switching Equipment. Its function is as follows :—On the long-wave circuit both countries, England and America, have to work on the same wavelength, so that it becomes necessary to switch from transmission to reception. When the subscriber at this end is talking he must have access to the transmitter, and while the New York man is talking he must be switched on to the receiver. This switching is done automatically by the speech currents from the subscriber. There are two types of voice-switching equipment, one developed by the Post Office, and the other by the Americans. The voice-switching equipment is also used on the short-wave services, because it enables a higher degree of amplification to be employed.

Fig. 2 is a photograph of the Rugby long-wave transmitter. The speech comes in from the land line, goes through a filter, and then into a modulator where it is converted first into a frequency of about 30,000 cycles, then to a final frequency of 60,000 cycles. The object of this scheme is the use of only one side-band. Perhaps I ought to say what a side-band is. When you modulate a high frequency, like a wireless frequency, with speech, it produces a sort of fringe around the main frequency. The energy is no longer confined on one frequency but fills a band on each side of that frequency. These bands are known as side-bands. The two bands both contain the same information as in the original speech, and it is only necessary to transmit one of them. Also it has been found that the carrier is unnecessary in the actual transmitting process, i.e. it may be cut out at the transmitter, thus saving a very considerable amount of power, and can be restored at the receiving station. It has to be restored to within 10 to 50 cycles frequency of the original frequency, otherwise distortion is produced. After the speech

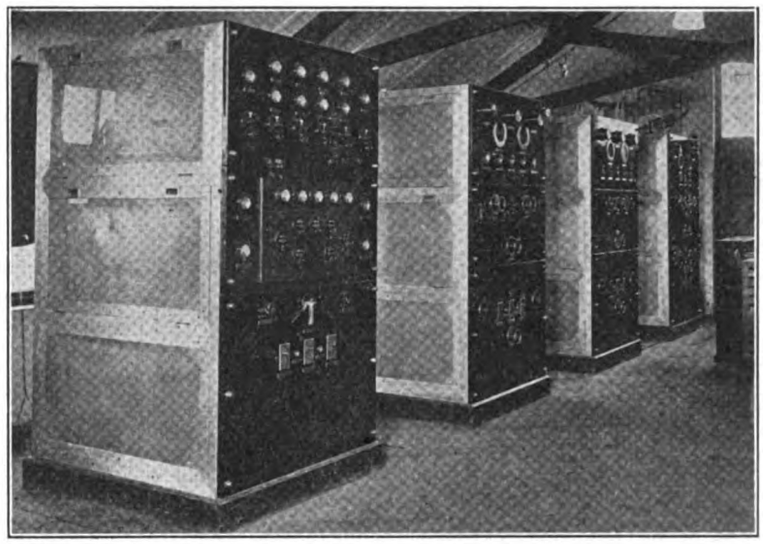

FIG. 2.—LONG-WAVE TELEPHONE TRANSMITTER, RUGBY.

has been converted into a band of wireless frequencies around 60,000 cycles per second, it has to be amplified to a high power for transmission from the aerial. The photograph shows the main power amplifiers, which consist of thirty 10-kilowatt valves in parallel. The control table from which the operator controls and adjusts the amplifier can be seen at the left-hand side of the picture. The valves used are metal glass water-cooled valves, the metal forming the anode of the valve is also the outside surface, so that it may be readily cooled by enclosing it in a water jacket.

Now with regard to short-wave telephony ; we have three short-wave services, but before starting the transmitting portion of the short waves, I want to tell you something about our means of generating oscillations.

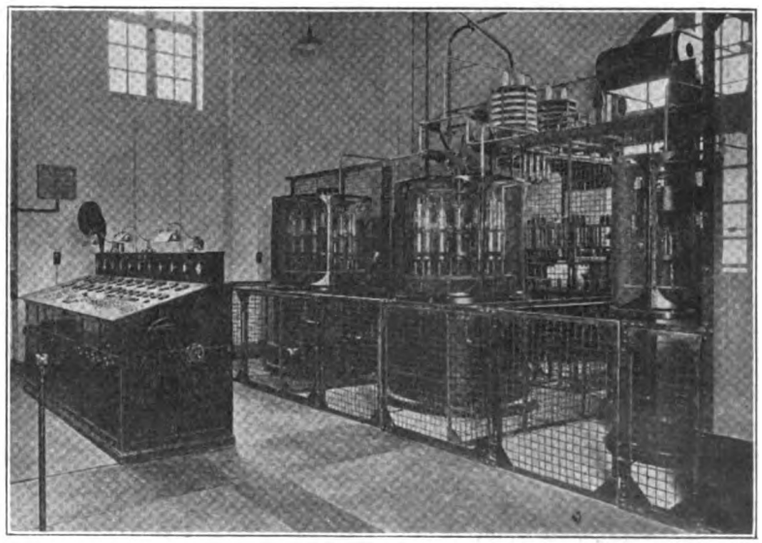

FIG. 3.—SHORT-WAVE TRANSMITTER AT RUGBY.

It was very soon found that it was necessary to obtain as near as possible constant frequency for these short waves. As it happened, means were at hand for generating these constant frequencies in a substance known as piezo electric quartz. It is a particular variety of quartz crystal which is sliced in a particular way to obtain one which will oscillate. (The speaker produced a sample and held it up.) This looks like an ordinary eyeglass, rather a large one ; the one we usually employ is small, half this size, which is a 500-metre crystal. If you apply an alternating electric force to two

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places the crystal will expand and contract. Conversely, if you press the crystal it will generate an electrical potential. If you connect the crystal to a valve in a certain way it will develop continuous oscillations, and as they are controlled by the quartz they are as constant in frequency as quartz is in its properties. The chief inconstancy is owing to temperature changes, so that it is necessary to have an arrangement whereby the temperature is kept constant. With the thermostatic controls we have at Rugby the temperature can be kept to 1/10th degree Centigrade.

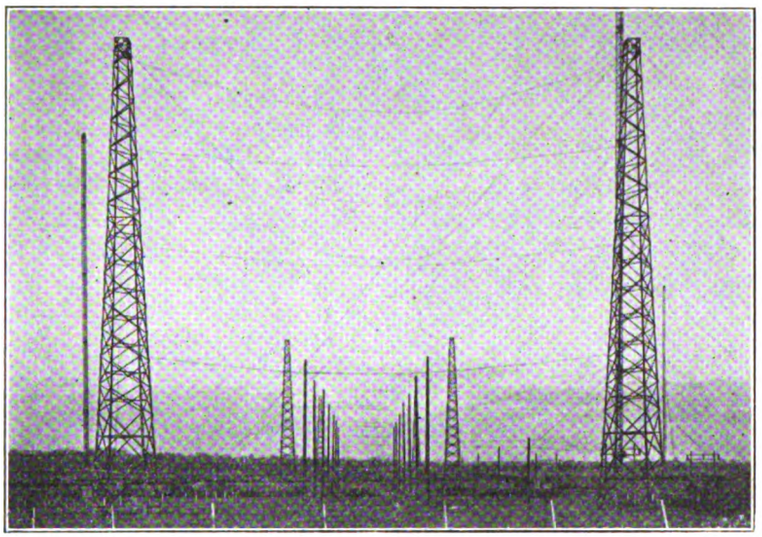

FIG. 4.—"T.W." SHORT-WAVE ANTENNA ARRAY, RUGBY.

We have one of these quartz oscillators for each frequency we generate. They are ground for oscillation on different frequencies, and I will merely give you one sample case for illustration.

We start off, say, with a crystal ground to oscillate at 128 metres. This is applied to a valve which is so regulated as to distort the frequency, thus producing harmonics. From the 128 metres we get in the output circuit of the valve an oscillation of 64 metres; that again is applied to a valve frequency distorting device, and the second harmonic of that frequency is

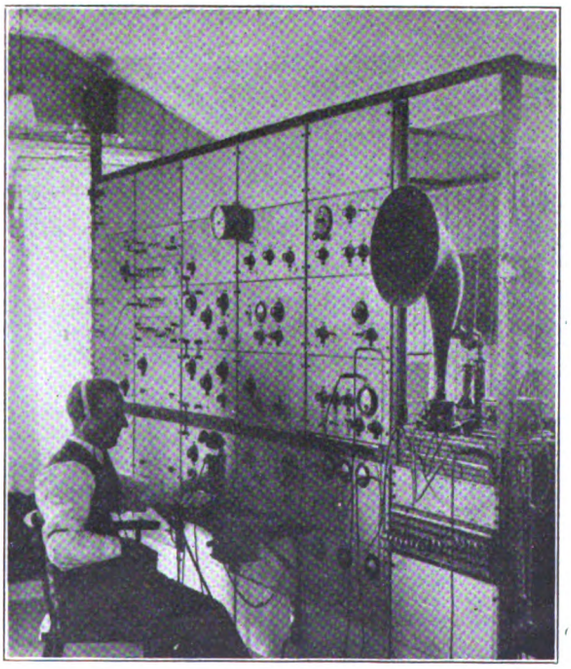

FIG. 5.—LONG-WAVE RECEIVER, CUPAR.

again selected, producing 32 metres. Again going on we get the second harmonic from 32 metres, which gives 16 metres. At this stage the harmonic is filtered and amplified to produce high power on 16 metres, which is transmitted from the aerial.

Fig. 3 is a picture of one of the short-wave transmitters at Rugby which amplifies the relatively small harmonics received from the distorting valves up to a point where four 15 kw. valves are employed for amplification. The stages of amplification are all carefully screened from each other to avoid reaction. From this point the power goes out on to transmission lines, which lead to the aerial. The aerial is situated anything up to half-a-mile away from the transmitter. The aerials demand a large amount of space, and therefore have to be arranged some distance apart.

Fig. 4 is a photograph showing one of the "arrays" as they are called.

The purpose of these antenna arrays, or beams, is to radiate energy in the forward direction towards the station that has to receive it, instead of having the radiation directed to all points of the compass.

The advantage of concentrating the energy in this way is principally in saving of power. We find by experiment that our best type of aerial at Rugby gives us a gain of about 300 times over what we should have to supply if we had a single aerial radiating in all directions.

The masts supporting the antenna array are 120 feet in height. The mast in the background is 820 feet high and is one of the masts on which the long-wave telephony antenna is supported. We have tried out a number of types of aerial. This is the latest, known as the "T.W." (from the initials of Mr. Walmsley, the Engineer who invented it). It concentrates the radiation in both the horizontal and vertical planes. Normally, an aerial will emit radiation in all directions, vertical as well as horizontal, but with this particular type of construction the object is to reduce the amount of both vertical and horizontal radiation.

I have shown you the transmitters. We now make a jump to the Receiving Station. The long-wave Receiving Station is at Cupar, in Scotland.

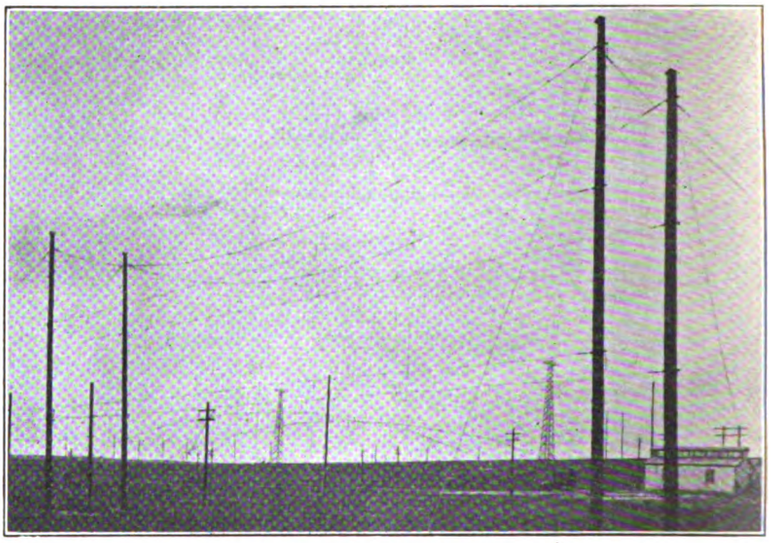

FIG. 6.—RECEIVING ANTENNA ARRAYS, BALDOCK.

The reason we went so far North was that we found atmospherics were so much weaker in Scotland than in the South; also Scotland is slightly nearer America! The improvement by going to Scotland for reception is of the order of between three and four times better than reception in the South.

We started the work in Scotland on what is known as the Beverage Antenna system. Its properties depend to a large extent upon having a dry soil. In this country the soil is never dry, and for that reason it is not so good from a wireless point of view. We were fairly successful with it, but decided to go in for something else, and we developed a combination of frame aerial and vertical aerial which we found distinctly better.

The object of any receiving antenna system is to get a system which will receive only from a forward direction and reject any signals or atmospherics which come from behind or from any other direction.

The radiation received by our frame and vertical aerial combination is largely confined to the forward direction within an angle of 40 degrees. There is very little coming in at the sides. We find that atmospherics trouble us principally in summer time and come from North Germany and Siberia practically at the back of our aerial, so that with this aerial system these particular atmospherics are cut out to a large extent.

Fig. 5 is a photograph of the long-wave receiver at Cupar.

Cupar is the long-wave receiving station. We have, however, a small short-wave receiving arrangement there, but it is only used as a standby and our main short-wave receiving plant is at Baldock. Fig. 6 is a photograph of the Baldock site. It is not very clear but will give you some idea of what Baldock looks like—a site of 900 acres—which we wanted in order to lay out these antenna schemes. Normally, they are mounted on telegraph poles

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and suspended on wires. We have three or four types of antenna array here and are still engaged in investigating the properties of these arrays—it will probably be some time before we reach a final conclusion.

One of the difficulties about reception of short-waves is "fading." Short-waves are propaged in the air at a height of over 60 miles above the earth in what is known as the Heaviside Layer, which is a conducting layer named after the famous mathematician. This layer refracts or bends the waves down again towards the earth, and in this way they can make a zigzag path between the transmitting station or the receiving station, or some of the waves may be bent just sufficiently in a trajectory to come down at the receiving station. We are not certain about the exact process of transmission in the Heaviside Layer, but there are irregularities which cause fading of the waves.

Fig. 7 is one of the receivers at Baldock. Transmission lines come in from the antenna array, pass through two high-frequency stages where there is an oscillator to beat the frequency down to an intermediate frequency at about 1,000 metres. At this point there are three amplifying stages, a rectifier, and there are two more low frequency stages.

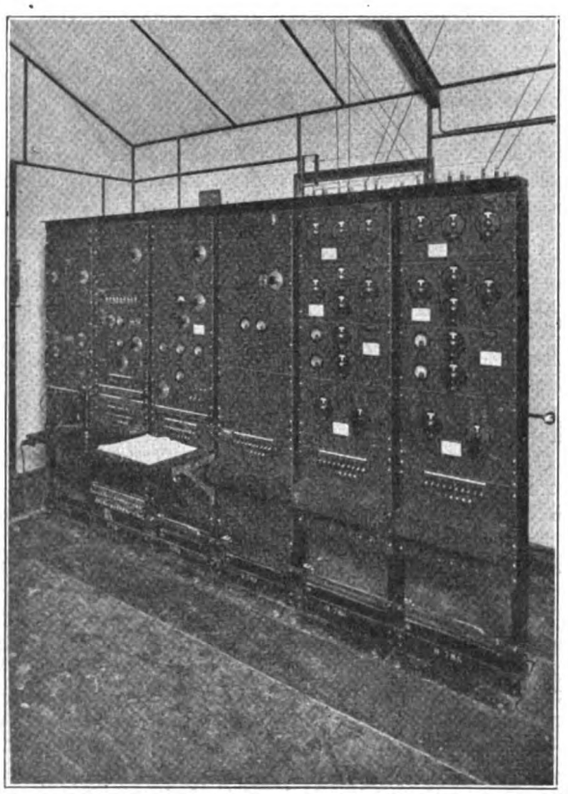

FIG. 7.—SHORT-WAVE RECEIVER, BALDOCK.

The receiver has an amplification of 120 decibels, which is one billion times; we can send out to the Trunk Exchange one billion times the energy we receive from the antenna.

On one of the panels there is an automatic gain control. Owing to the fact that signals fluctuate up and down, due to fading, we have to control the amplification. This can be done automatically. The automatic gain control will produce a practically constant output even when the input signal varies in power 100,000 times.

The prospects for transatlantic telephony at the present time look fairly bright. The technical possibilities as to communication with New York are very good. Also there are possibilities of opening up similar communication with the Colonies and distant parts of the earth. One of the difficulties we shall have in the near future is the fact that the total number of wavelengths is now fairly limited and will apparently soon be exhausted. So far we do not know any other means of transmission, so that we can see within sight a complete blockage when we shall have no more wavelengths available. One must not, however, give up hope—other wavelengths may be found. In view of this difficulty the A. T. & T. Co. have projected a Telephone Submarine Cable which will probably be ready in two years and which will form a very solid and reliable means of communication between here and New York. It will also open the way to means of communication to distant parts of the earth, in case we are blocked in the wavelength situation. Naturally, as a radio man, I do not give up hope on the radio side, but it is pleasant to think that in 20 or 50 years' time communications can still be increased if desired by the telephone submarine cable.

PROGRESS OF THE TELEPHONE SYSTEM.

THE total number of telephone stations in the Post Office system at Feb. 28, 1930, was 1,867,500, representing an increase of 11,864 on the total at the end of the previous month.

The growth for the month of February is summarised below :—

	London.	*Provinces.*
Telephone Stations—		
Total at Feb. 28	669,455	1,198,045
Net increase for month	4,111	7,753
Residence Rate Subscribers—		
Total	165,226	258,181
Net increase	1,690	2,460
Call Office Stations (including Kiosks)—		
Total	5,960	24,688
Net increase	38	292
Kiosks—		
Total	1,662	6,175
Net increase	38	115
Rural Party Line Stations—		
Total	—	10,155
Net increase	—	—
Rural Railway Stations connected with Exchange System—		
Total	17	1,557
Net increase	—	53

The number of inland trunk calls dealt with in December, 1929 (the latest statistics available) was 9,454,861, bringing the total number for the year up to 116,488,568; this figure represents an increase of 8,896,199, or 8.3%, on the total for the year ended December, 1929. Outgoing international calls in December numbered 39,980, and incoming international calls 44,353, making the totals for the year 527,896 and 570,085 respectively. The increase over the total for the twelve months ended December, 1928 was 105,982 (25.1%) in respect of outgoing calls, and 114,709 (25.2%) in respect of incoming calls..

Further progress was made during the month of March with the development of the local exchange system. New exchanges opened included the following :—

LONDON—Ingrebourne.

PROVINCES—Aldeby, Ash (Whitchurch), Bawdeswell, Boarhills, Dunlop, Hartington, Homersfield, Knowsley, Luss, Luthrie, Manston, Marshbrook, Maze, Morham, Rillington, Rockbourne, Strachur, Twinstead, Upton Grey, Whiterashes, Yardley Gobion (all rural automatic);

and among the more important exchanges extended were :—

LONDON—Chingford.

PROVINCES—Arbroath, Banbury, Bell (Glasgow), Clitheroe, Dorchester, Falkirk, Gt. Yarmouth, Ibrox, Minehead, Rutherglen, Victoria (Birmingham), Welwyn Garden.

During the month the following additions to the main underground system were completed and brought into use :—

Bristol—Chipping Sodbury,
Leicester—Hinckley,
Portsmouth—Chichester,
Basingstoke—Reading (section of Guildford—Basingstoke—Reading cable),
Manchester—Liverpool (additional cable),
London—Maidenhead,
Sunderland—Sheraton,

while 75 new overhead trunk circuits were completed, and 88 additional circuits were provided by means of spare wires in underground cables.

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TELEGRAPHIC MEMORABILIA.

SINCE scribbling last month's Memorabilia the writer has had no less than three interesting experiences. One of these was listening to Mr. H. H. Harrison, M.I.E.E. on "The Developments of Machine Telegraphy," to which more complete reference will be found in another part of the present issue of the *Journal*.

The second was a visit to the Trunk Exchange, Carter Lane, thanks to the kind courtesy of the Controller of the Telephones. It is many years since my daily duties were very extensively connected with the testing and fault-locating of telephone circuits, long and short. By the very fact of this time-gap one could, however, the better obtain a first class conception of the progress made in telephone technique and the advance in standards of speech. Gone was the Selective Night Ringing with Chelmsford, Colchester, &c.! Gone, too, were the heavy gauge lines which, like copper rods, extended overhead from London to Glasgow! Valves had appeared on the scene and melted those rods into mere threads which could be packed away into lead sheathing by the score! Could I speak to Glasgow? "Certainly," and once again with excellent clarity came the Scottish accent. "Would I care to speak to New York?" Through to the American capital in 20 seconds—all but bewildered by the miracle of it, yet recover quickly enough to get good speech, and am heard equally well. Asked to compare between the speech values of the Glasgow trunk and the American circuit one was bound to say that, "making allowances for the Scotch accent on the first circuit and the Yankee drawl on the latter, there does not appear much to choose between them."

The third thrill was the paper by Mr. E. S. Ritter, D.F.H., M.I.E.E. on "Picture Transmission," the last of a very successful session of the Post Office Telephone and Telegraph Society. The lecturer was clear and concise in his explanations and painstaking to a fault. Mr. Ritter is not one to over-rate the value present or prospective of this new phase of telegraphy. One very special feature and a none too common one was his open-mindedness upon the subject with which he is so well acquainted. It was a gracious, though admittedly a useful courtesy to invite an officer of a private company to the meeting, who, by the latter's exhibition of his own slides, was able to show some of the difficulties under which the Marconi Company are labouring in their experiments with the ether as a medium for the transmission of still-life pictures, documents, &c. Examples of the work of the different systems were displayed round the hall—American, French, and German—the latter being that at present in use by the British Post Office.

On the way home there came yet another gentle shock, for the newspapers announced that a television set of apparatus had been installed at No. 10, Downing Street! Truly we are progressing, but whether the installation comprises both receiver and transmitter there is no evidence to say, and there is therefore no clue to the use to which the apparatus is to be put. Is it for the head of the Government to watch what is going on in the House of Commons, and/or for the members of the House of Commons to keep an eye on the Premier of the moment? Anyway, it is worthy of note that the B.B.C.'s dual-wave transmitters at Brookman's Park were utilised on Mar. 31 to broadcast simultaneously vision, speech, and song. The sound broadcast was on 356 metres and the visual on 261 metres. The dual broadcasts are at present conducted from the Baird Television Company's studios through the agency of the B.B.C., as above, from 11 a.m. to 11.30 a.m. except Saturdays and Sundays, and also from midnight to 12.30 a.m. on Tuesdays and Fridays. British Summer times in all cases.

Round the World!—ALGERIA.—It is reported, says *The Electrical Review*, that the French P.T.T. station at Algiers is to be provided with a relaying installation this summer. The new plant will be situated at Oran and will be of 6-k.w. power. AUSTRALIA.—A sum of £750,000 is to be spent on the broadcasting service and its reorganisation. The scheme includes the erection of at least a dozen subsidiary stations in different parts of the Commonwealth, and, when completed in about three years, says my informant, is expected to provide a good service for about 95% of the population. AUSTRIA.—There has been some considerable dissatisfaction in Austria regarding alleged interference with broadcasting due to H.F. apparatus used by the medical and other professions. It is understood that matters went so far as to prohibit the use of H.F. apparatus after 10 p.m. without special permission from the authorities. The medical fraternity have not, however, permitted the grass to grow under their feet, for at a recent meeting held in Vienna, one of the chief surgeons of that city, Dr. Kowatschik by name, has himself exhibited a special wave-filter invented by two Viennese physicists—the Drs. Kobler and Razdowitz, which, when tested in conjunction with diathermic apparatus and a loud-speaker, had the effect of destroying all radio reception. Immediately upon introducing the filter, hey presto! The intruder was absolutely inaudible! ARGENTINA.—No less than 22 stations within the city limits of Buenos Aires have, says *World Radio*, been deviating from their assigned wavelengths. The Government, since taking control, has taken the drastic step of ordering *all* broadcasting stations to move their transmitters out of the city limits during the next nine months. BELGIUM.—An association called the Institut International de Télévision has lately been formed in Belgium with its headquarters at 87, Chaussée de Tervueren, Brussels. The first issue of the society's journal, *Bulletin de l'Institut International de Télévision*, appeared in January. The *Bulletin* is devoted to the scientific study of the new science. CHINA.—The situation as regards communication in China does not clarify itself very quickly, and to add to the apparent confusion mentioned in the March number of these notes there comes the information from Reuter's Agency in Nankin that a contract has now actually been signed between the Central Government and the Telefunken Company, Berlin, for the erection of a powerful station there. FRANCE.—A new radio transmitter is to be erected in a suburb of Nice, where the studio will be located. It is said that the power will be at least 25 k.w., and is expected to be working before the end of the summer, and will replace the Juan-les-Pins station. GERMANY.—The German P.O. is installing public telephone kiosks from which not only can trunk calls be made, but telegrams may also be dictated for transmission forward. The apparatus, which has proved popular in towns the size of Cologne, can be operated by coins of the value of 1 mark and 5, 10, and 50 pfennig in any combination. GREECE.—The Grecian islands are to be linked with Athens and the mainland by wireless-telephone and telegraph services, for which the equipment has been ordered from Marconi's Wireless Telegraph Co. Three duplex telephony and high-speed telegraphy stations are to be erected, one near Athens, one on Crete, and the third on Chios. A radio telegraph ship-to-shore installation is also in course of construction. HOLLAND.—Telephone "subs." at the Hague can now listen to broadcasting stations by attaching a loudspeaker or head-phone to their telephone instruments and pressing a button. Already over 400 telephones have been fitted with the necessary attachments for listening in. HUNGARY.—The power of the Budapest (Lakihegy) station is shortly to be raised from 12 to 120 k.w., while Roumanian news reports that Bucharest is so completely outclassed in power by the Moscow station, which has for some time been using 100 k.w. energy, says *World Radio*, and is still being further increased, that it is intended to raise the power of the former at whatever cost. INDIA.—The following additional particulars to those which appeared last month, regarding the transfer of the Indian Broadcasting Co. by the Government of India, and supplied by Reuter's Bombay agency, may prove interesting. Broadcasting is now added as a function of the Posts and Telegraphs Department with Mr. P. J. Edmunds, Director of Wireless, at the head of the Broadcasting Branch. [*Memo.*—The statement regarding an alleged telephone conversation between Karachi and London which appeared in some of the daily press, &c. in London in January, has now been definitely contradicted by the Deputy D.-G. of the Indian Posts and Telegraphs. As we could find no trace of the "event" at this end, nor obtain any particulars which would confirm this feat, the information was treated as unconfirmed and was not published.—ED., *T. & T. J.*] NEW ZEALAND.—Wireless stations in the Pacific under the control of the New Zealand Government are being modernised. Raratonga is the next station for which a new transmitter has been ordered

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to replace one of older type. This station will then link up Wellington (N.Z.) and Apia, thus forming an important link in the wireless network of the Pacific. PANAMA.—A curious situation has arisen in this area, according to the following paragraph published by *The Electrical Review*:—"The American State Department and the Panama Government have exchanged official communications in connexion with the latest concessions that Panama has granted to the British Alves Company in the vicinity of the canal, giving the company the right to erect and use wireless stations. The *Financial Times* states that Panama has assured the U.S.A. that Panama does not intend to violate the decree of Aug. 29, 1914, granting the United States control of wireless within the Republic, and that the British concessionaires cannot use wireless without the consent of the United States. It is understood that Panama has explained that the wireless rights clause was overlooked when the concession was granted. ROUMANIA.—*See above* Bucharest, &c., under HUNGARY. U.S.A.—It is claimed by the *Daily Express* that the new broadcasting station in Mohawk Valley which now transmits with a power of 200 k.w., with its call sign of W2KAG is more powerful than the most powerful European station which that authority places as low as 60 k.w. The general statement is likely to be correct, but it is known that Moscow's power runs into three figures.

Companies.—The dividend of the Direct Spanish Telegraph Co., Ltd., for 1929 on the ordinary shares is 8%, free of tax, as against 10% in 1928. A dividend of the Indian Radio Telegraph Co. is recommended of 12½% on the ordinary shares for the past year.

Personal.—If somewhat belated, none the less sincere are congratulations extended to Mr. A. H. Read upon his promotion to the post of Deputy-Inspector, Wireless Telegraph Establishment, Secretary's Office. Personal contact on official matters with Mr. Read have always proved a most pleasant experience to those in the C.T.O. Foreign, who until the changes of last year, were in very frequent touch on questions relating to radio matters.

The *Daily Telegraph* announces that the late Mr. Henry W. Brookman, a former Superintendent of the C.T.O., London, left estate valued at £1,215 (£1,182 net personalty).

Mr. J. B. Ryall, sectional engineer, Gloucester, has recently retired from the Government Service. He joined the United Telephone Co. in 1883, and has therefore about 47 years' active service to his credit.

It is understood that the retirement of Mr. W. J. Medlyn from the post of Superintending Engineer, South Lancs, is likely to take place early next month. Mr. Medlyn has occupied that position since 1913 and commenced service with the Post Office as a Cardiff telegraphist in 1888, transferring to the Engineering Department as Junior Clerk in 1891.

News of Retired Officers.—A copy of a Torquay newspaper shows Mr. Honeysett well to the fore at the new club-house of the Dundee-Hooper Rover Scouts and looking young as ever. Mr. Bradley, formerly of the Cable Room, appears to be travelling on the North African Coast, judging by the Arabesque postcards which have reached our prosaic city! A photograph of Mr. Alec MacEwan bathing in the Thames shows that his seventy-four years (on the 12th ult.) sit lightly upon him, for he still maintains that the morning plunge in April at 6.30, "is like tumbling into a feather bed."

The C.O.D.O.C.—The criticisms of the *C.T.O. Chronicle* on the performance of "The Last of Mrs. Cheyney" were, as should be the case, more inclined to severity than those of the Daily Press critics. H.M.W., in the *Daily Telegraph*, was good enough to assure us that "The club seems firmly established," and terminated with "the cast were appreciatively handled and altogether the applause after each act was faithfully earned." Thus it is really good at times to, "see ourselves as others see us"!

Economy.—"Economy does not consist in the reckless reduction of estimates. On the contrary there can be no economy where there is no efficiency."—Lord Beaconsfield, 1868.

J. J. T.

CORRESPONDENCE.

HOW TO IMPROVE THE TELEGRAPH SERVICE.

TO THE EDITOR OF "THE TELEGRAPH AND TELEPHONE JOURNAL."

SIR,—The experimental open discussion which took place at the March meeting of the Post Office Telephone and Telegraph Society of London was a great success, and there is no doubt that the majority of the audience regretted that time would not allow a larger number of speakers to voice their views on such an interesting topic as the Inland Telegraph service. After the exhaustive opening speech of Mr. L. Simon, however, it seemed difficult to suggest a remedial avenue which might be explored, or an aspect which had not been considered. The Secretariat, ever thorough, thinks of everything. It is alleged that there is plenty of scope for improvement in the Telegraph Service, and yet, on examination, one finds that in no direction is it possible to make revolutionary changes which will have the desired effect. One can only look round for opportunities of making small alterations which, taken in the aggregate, might result in a substantial saving, or a marked increase in efficiency.

The telephone service, in my opinion, has two advantageous phases which its sister organisation does not possess, viz., the zone system of charges and the rent charged for the facility of being able to utilise certain services from one's own premises.

It is unfortunate, at this late date, it does not seem practicable to introduce a zone system of charges for telegrams, although such an arrangement would very probably mean the financial salvation of the Telegraph Service. If it is possible at any time to persuade the British public to submit to zone telegraphic rates, the method of charging suggested by Mr. F. J. Binder in the March issue of the *Telegraph and Telephone Journal*, appears to furnish an excellent basis, avoiding intricate calculation of mileage.

As regards the second advantage to which I have referred, it may be said *en passant* that a reduction in the rental charges for telephones might land the Telephone Service in a financial position no more satisfactory than that of the Telegraphs. I want to point out, however, that this rent is charged for the advantage of being able to speak to a friend, send an express letter, or send a telegram, without walking to the Post Office. The charges for these items are additional to the rental, and each renter is a potential user of any of these methods of communication. Why then should not the Telegraph Service be credited with a proportion of the rental, or at least with a certain proportion on each occasion of using the installation to send a telegram?

Among the disadvantageous features of the Telegraph Service are non-manipulative duties and clerical work. There are circulation "finished" and book duties, and the passing backwards and forwards of official papers fixing responsibility for errors, &c. An appreciable aggregate economy might be effected by examining local circumstances carefully to see what operations could be eliminated.

The Post Office is at present educating certain elements of its junior staff. This expenditure seems unnecessary when so many boys and girls of sound elementary or secondary education are available for the public service. Incidentally, if the Post Office tried to obtain, at the outset, the best human material for its outlay, the general efficiency of the Telegraph Service might be enhanced.

The "walk" system of delivery has received a considerable measure of criticism and, when the large number of cases of delay after reaching the office of destination are considered, it would appear that fresh methods must be tried, even if more expense is involved. The complaints of the telegraphing public concerning delay in delivery bring more discredit on the Service, and have a greater effect on the volume of traffic, than those formulated by parliamentary critics. In cases of delay "*qui s'excuse s'accuse.*" The "walk" plan has its advantages, but for practical purposes the American hotel "bellhop" system would be hard to beat, particularly if a commission for the delivery of each telegram in excess of a certain number were credited to the delivery messengers. In many occupations the "salary and commission" idea has a distinct bearing on output, and there is no reason to suppose that delivery rooms and instrument galleries would prove exceptions to the theory. The difficulties of formulating a suitable scheme cannot be insuperable and the consequent reduction in transit time between originating and delivery offices would have beneficial results in every direction.

It is gratifying to know that the policy of outside representation is to be pursued. The canvassing staff is a useful medium between the Post Office and the public for dealing with complaints, but officers with a commercial instinct must be selected, who will not forget that every person encountered is a potential customer. Savings Certificates and the Savings Bank are being "boosted" and similar methods should be employed in connexion with telegrams. Canvassers should never forget the American verse:—

"He who whispers down a well
About the goods he has to sell,
Will never make so many dollars
As he who climbs a tree and hollers."

The Inland Telegraph Service occupied the attention of the meeting of the Telephone and Telegraph Society, but perhaps a few remarks from one employed in the Foreign Telegraph Service, which is also involved in some respects, will not be declined.—Yours faithfully,

Cable Room, G.P.O. (W), Mar. 28, 1930.

H. G. SELLARS.

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LONDON TELEPHONISTS' SOCIETY MUSICAL PLAY, "THE MIXTURE AS BEFORE."

To those who had seen or heard the annual Telephone Musical Play of the London Telephonists' Society the title of this year's play promised all that could be desired; and the record audiences which assembled at King George's Hall on April 9 and 10 to see and hear the latest item of the ever-popular series by Miss McMillan, showed by their manifest delight that the promise had been abundantly fulfilled. "The Mixture as Before"—whimsically humorous lines, settings, and topical allusions; pretty music, pretty girls, and admirable singing by both principals and chorus. What better prescription could be desired?

The story is this. A Superintendent of Traffic, on a recruiting mission bent, appears before a school class and paints for the assembled scholars a glowing picture of the London Telephone Service. The missionary's rose-coloured statements are at first received with more or less polite incredulity, until the arrival of the Mistress of the Operating School, with whom the Headmaster instantly falls in love. Then the tide turns in favour of the L.T.S.; and despite the somewhat disconcerting reappearance of an "old boy" of the School who has waited in the L.T.S. for promotion for some 79 years, the whole Class—including the Headmaster—fall victims to the blandishments of the Superintendent of Traffic and announce their intention of joining the L.T.S. In the words of one of their number:—

"I've always had a fancy to join the L.T.S.,
And answer Lords and Dukes and p'raps a Sheik.
The work, I hear, is easy,
And one's colleagues bright and breezy,
And the salary is fifteen pounds a week!"

In due course all the recruits meet again in the Operating School. The Headmaster, by his proficiency in the abstruse sciences, has succeeded in qualifying as an Assistant Superintendent of Traffic, Class II! while the erstwhile Superintendent of Traffic has forsaken telephones for Scotland Yard and has become a Detective. He again interrupts School procedure by an unexpected visit, this time to investigate the mysterious disappearance of a valuable jewelled dialling top belonging to the President of the Telephone Company. After patient investigation and much tribulation for the five pairs of lovers whose fortunes are involved in this story, it is found that the missing dialling top has been returned to Store by a too-punctilious Supervisor! All ends happily as a Musical Play should; and the Superintendent-Detective returns to the "glorious uncertainty" of the L.T.S.!

The cast was substantially that of last year and all gave of their best. Miss Blair-Street, whose services the Society was again so fortunate as to secure, sang brilliantly in the principal soprano part. Miss Peggy Murray, whose work in a small part of last year's play revealed marked artistic gifts, more than fulfilled the promise of her earlier appearance, while Miss Tilling, another of the schoolgirls, took her part with her usual charm. Miss Lattimer made a fascinating School Mistress; while the familiar rôle of Supervisor again gave Miss Price an opportunity to express in her inimitable way the humour of dignity. As always, Capt. Hemsley delighted the audience alike with his masterly singing and excellent fooling. His singing of the dialling song will long be the subject of merriment in the London Telephone Service. Mr. Whiffen and Mr. Williams also sang brilliantly, while Mr. Neal was an excellent Schoolmaster. Miss Lilian Jones and her dancers again ably provided an indispensable feature of a Musical Play, while Miss Garvey accompanied with her usual skill. As on previous occasions, a capable band of stewards under the direction of Mr. E. S. Abbott, ably superintended the seating arrangements.

On both evenings the close of the play was marked by enthusiastic tributes of appreciation of the work of the author, cast, and producer (Mr. Pounds), and at the last performance the Society expressed by a special gift to Miss McMillan its appreciation of the splendid work she has done for the Society in providing a Telephone Play for the past six years.

It was a happy thought of the London Telephonists' Society to choose for its Musical Plays the end of the Session, when the breath of Spring is in the air and at its world-old summons Youth calls to Youth for music, laughter and love:—

"For what is so sweet as a golden song,
That rings in your heart for a whole life long,
A music of laughter, a sigh of love,
That makes us like angels in Heaven above,
A kiss in the rhyme of it,
Joy in the chime of it,
Hearts to the time of it, beating strong."

And this, in essence, is "The Mixture as Before."

THE MAINTENANCE OF TELEPHONE PLANT.

H. G. S. PECK, B.Sc. (HONS.), M.I.E.E.

THE maintenance of telephone plant implies the keeping of the plant in such a condition that it will give a satisfactory service. Renewals of obsolescent or of decayed plant may properly be regarded as part of maintenance but this article will be restricted to the means adopted for the prevention or anticipation of faults, to the methods of handling faults and to the general conditions that affect the carrying out of maintenance. Maintenance has in the past been regarded often as synonymous with fault clearing, but nowadays it aims at preventing an increase in the occurrence of faults with increasing age of plant, or it may even go further and reduce the number of faults by removing their causes.

Faults in the abstract, however, are unavoidable, and a brief discussion of the method of handling fault complaints may be of interest. At the outset a "docket" for the complaint is entered up by the Supervisor of the Exchange concerned and this docket is the basis of the fault recording system. If the fault is obviously in the exchange, the docket is passed directly to the exchange maintenance staff for attention; for a junction fault the docket is passed direct to the Test Room and if a subscriber's circuit is concerned the docket is passed to the "testing operator." This operator is provided with a simple test set for making preliminary tests on subscribers' lines, with circuits for plugging up lines that are unuseable, and with a howler for producing a sufficiently loud noise in the receiver to attract the attention of a subscriber who has left his telephone off the hook. Should the testing operator be satisfied that the subscriber's circuit is faulty the docket is passed to the test room. (In automatic and other exchanges where there is no testing operator, subscribers' dockets, like junction dockets, are passed direct to the test room.)

Cards, known as "fault cards," are kept for every circuit and on receipt of a docket in the test room the appropriate card is extracted from the file and the report entered thereon. The card is then kept in front of the test clerk until the fault has been cleared and is not returned to the file until all records have been completed.

Each fault card contains a complete fault history of the circuit to which it refers and this history is of the very greatest assistance to the test clerk in the making of his tests and in the subsequent handling of the fault. Attention is thereby drawn to intermittent faults which have been reported on previous occasions and tested O.K., also to cases of excessive trouble on a circuit or to repeated faults of a similar nature or on the same piece of apparatus. The

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attention of a Supervising Officer is drawn by the test clerk when any circuit has been reported faulty more than once in a week or more than twice in four weeks or when a fault is not cleared within 48 hours, and in any other cases where it appears that an indifferent service is being given. Investigations are made when necessary.

The test clerk makes all necessary tests in connexion with a fault. He passes on the fault to the line fault-finder or the apparatus maintenance man or to the distant exchange as the case may be, and is responsible for seeing that the fault is cleared. Careful and accurate work by the test clerk leads to rapid clearance of faults, and by intelligent interpretation of the results of his tests he can avoid much waste of labour by faultsmen.

A battery having a PD of from 20 to 30 volts greater than that of the exchange battery and a galvanometer in the shape of a moving coil voltmeter having a resistance of 2,500 ohms per volt are fitted on the test desk. On the voltmeter is a second scale one-tenth of the first and a second battery of this voltage is also provided. Resistances are measured by using the meter as a milliammeter and a one-tenth shunt can be connected across the low-scale winding. Tables are provided showing the resistances corresponding to the various deflections on the high and low and shunted scales. With 8- and 80-volt batteries the range of measurements thus covered is from 25 ohms to 15½ megohms. The voltmeter is also used for making ballistic tests to verify the condition of condensers. Artificial cables having the transmission equivalents of 34 miles and 45 miles of standard cable can be introduced into the circuit for making checks of the transmission conditions. A dial speed tester and impulse counter are added in automatic areas.

Exchange Equipment (Manual).

Exchange equipment is assembled in large quantities in special buildings under the continuous supervision of the telephone staff and is therefore particularly adapted to the application of anticipative or preventive maintenance.

Routine tests of all circuits on manual switchboards, and inspections of such items as plugs, cords, key handles, &c., are carried out at regular intervals by the operating staff outside the busy period of the day, whilst more detailed and rigorous tests and inspections are made by the engineering staff. Where apparatus is called upon to operate under varying conditions, tests are made through resistances in excess of the maximum that will be encountered in practice. The resistances, relays, lamps and meters necessary for the making of functional tests on the various circuits are made up in the form of portable testers, each class of circuit having its appropriate tester. The general principle underlying the frequency of the routine tests in manual exchanges is that all common equipment such as cord circuits, junctions and operators' telephones is tested daily, whilst equipment peculiar to individual circuits is tested at less frequent intervals.

It is essential to the proper maintenance of switching equipment that extreme cleanliness shall be observed. It is not only necessary that the switching equipment shall be kept free from dust, but the floors, walls, cable runs, cables and wiring must also receive attention. Such cleanliness has not only a direct effect on the operation of the plant, but its psychological effect on the staff is also helpful.

The most frequent faults in manual exchanges occur on cords, keys, plugs and jacks. These are the parts of the equipment subject to the greatest movement and to direct handling by the operators.

Exchange Equipment (Automatic).

The method of maintaining equipment in automatic exchanges is essentially similar to that in manual exchanges, but owing to the greater complexity of the automatic switching equipment and its segregation into groups of common apparatus, it is necessary to devote a greater amount of attention to the prevention and anticipation of faults.

The detachment of the greater part of the automatic equipment from direct association with any circuit connected to the manual switchboard renders it impossible to make use of the spare time of the operators for routine testing. This work on such equipment is, therefore, done by engineering staff.

The adjustment of the automatic switches and relays is based on a system of gauging of clearances and on the measuring of spring tensions. Every maintenance man is provided with feeler gauges ranging from 2 mils to 16 mils and with tension meters for measuring tensions between 2 and 200 grammes.

The one new and outstanding feature in the maintenance of the automatic equipment is the importance of the operating and release lags of relays and even of the transit times of relay contacts. So far, the accuracy of these times (which are measured in milliseconds) has been sufficiently ensured by the gauging methods, but the growth of the automatic system, the consequent increase in the complexity of the circuits and the need for interconnexion between the automatic equipments in many different exchanges have all magnified the ill effects of inaccurate timing, and it seems inevitable that means for measuring times must be added to the list of "tools."

Proper lubrication of automatic switches is essential. The frequency of this lubrication depends upon the type of switch and the load which it carries. The most frequent lubrications are carried out monthly and the least frequent six-monthly.

The various inspections, overhauls, checks and tests to be carried out at regular intervals are known as "routines," and as many as 60 different routines are scheduled for application to the equipment in director exchanges. Manual testing of the most complicated circuits would be extremely costly, even if humanly possible. Automatic testers have most fortunately been designed, and these are undoubtedly the nearest approach to robots so far introduced into the telephone system.

It is even more important with automatic equipment than with manual equipment that the highest possible standard of cleanliness shall be observed in the switchrooms. The greatest enemy of the automatic maintenance engineers is dust. Elaborate precautions are taken for its exclusion from exchanges by means of the ventilating system, and all relays are fitted under covers, but, in spite of these steps, the occurrence of dirty contact troubles is one of the most frequent causes of failure and misoperation. Other outstanding troubles are sticking or slow releasing of relays, intermittent or disconnected wiper cords on selectors and wipers out of adjustment.

Subscribers' Apparatus.

For several reasons subscribers' apparatus is perhaps the most difficult part of the system to maintain efficiently. The apparatus to be dealt with by one workman may be of so many different types and may include circuits as complicated as those met with in public exchanges. Primary batteries of the wet type are used, and these are a bugbear; secondary cells are installed at private branch exchanges, and the charging of these must be controlled. The workman has available only such tools, stores and testing equipment as he can carry day by day; generally he works alone, and cannot readily obtain the assistance of another. It is the subscribers' apparatus maintenance man who encounters personally the irate subscriber, or, perhaps even worse, who must try to satisfy the inveterate complainant. Repeat visits become frequent if the work is not efficiently carried out, and immediate supervision is difficult, although very considerable assistance in this can be obtained from the fault recording system.

(To be continued.)

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A typical street scene in Manila, Philippine Islands. The modernness of Manila's telephone system is indicated by the fact that of its 12,700 telephones now in operation, approximately 70% are being served by Strowger Automatic telephone equipment.

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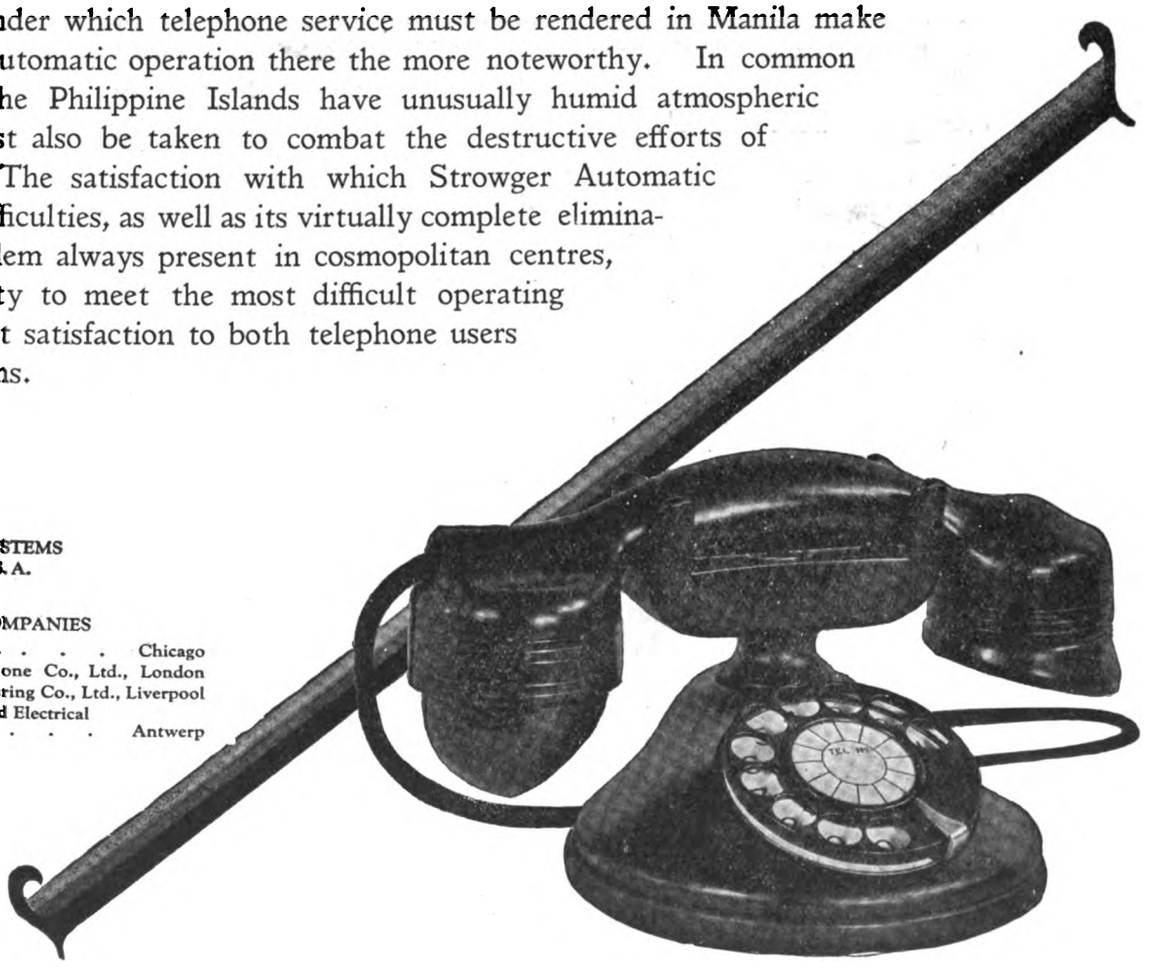
rowger Automatic Brings Unexcelled rvice to Philippine Islands

E Philippine Islands Telephone and Telegraph Company first began the use of Strowger Automatic equipment in 1919, when the Binondo office in Manila was rted to this mode of operation. Since that time this equipment has also been installed in, South and Santa Mesa offices, until to-day Manila has 8,700 lines of Strowger matic apparatus in operation.

difficult conditions under which telephone service must be rendered in Manila make uccess of Strowger Automatic operation there the more noteworthy. In common Hawaii and Cuba, the Philippine Islands have unusually humid atmospheric tions. Measures must also be taken to combat the destructive efforts of al boring insects. The satisfaction with which Strowger Automatic tion has met these difficulties, as well as its virtually complete elimina- of the language problem always present in cosmopolitan centres, s decisively its ability to meet the most difficult operating tions with the highest satisfaction to both telephone users operating organisations.



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The
Telegraph and Telephone Journal.

PUBLISHED MONTHLY IN THE INTERESTS OF THE TELEGRAPH AND TELEPHONE SERVICE, UNDER THE PATRONAGE OF THE POSTMASTER-GENERAL.

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NOTICES.

As the object of the JOURNAL is the interchange of information on all subjects affecting the Telegraph and Telephone Service, the Managing Editor will be glad to consider contributions, and all communications together with photographs, diagrams, or other illustrations, should be addressed to him at the G.P.O. North, London, E.C.1. The Managing Editor will not be responsible for any manuscripts which he finds himself unable to use, but he will take the utmost care to return such manuscripts as promptly as possible. Photographs illustrating accepted articles will be returned if desired.

VOL. XVI. MAY, 1930. No. 182.

LIFE-SAVING AND HOAXING.

THE telephone, as seen from two widely different angles, was much in evidence in the Press on two successive days at the beginning of last month. In the first instance it appeared as a "life-saver," in consequence of a statement of the chairman of the Montgomeryshire National Health Insurance Committee, that in the rural district of that county, where the telephone facilities were scantiest, the death rate for the last nine years was 16.1 compared with 13.7 in the rest of the county. The *Manchester Guardian*, whilst remarking that it would be a bold proposition to argue that the lower death rate of our own era is due to better communications rather than to greater knowledge and healthier conditions of life, adds "it is tempting to speculate on how many lives are saved in the course of a modern year by the ease with which a telephone call can be made." No one will venture to gainsay, and we ourselves least of anyone, the value of the telephone's assistance in all cases of emergency, but a doctor cannot adequately diagnose by telephone; he needs to reach his patient, and when the latter is fifteen miles from the nearest doctor, and dies from lack of proper medical attention, it might seem equally proper to describe him as "killed by lack of train service," or "killed by lack of motors," as "killed by lack of telephones." There will always, we conjecture, be degrees of remoteness from urban amenities at which the resources of science necessarily become less and less available, and at which the combined lack of them must be a serious drawback in cases of gravity.

The other aspect of the telephone was its employment in hoaxing—*apropos* of the first of April. We read accounts of messages left in the desks of unsuspecting people in London, asking them to ring up a number (which turns out to be the "Zoo") and ask for Mr. Wolf, Mr. C. Lyon, Mr. Fox, or Mr. L. E. Fant. Special steps to intercept these calls were taken at Primrose Exchange on April 1, and we imagine the joke was shorn of some of its beauty from the joker's point of view by this means. Probably this feat which, like most puerilities, is by no means original, had its genesis in a joke which raged like an epidemic in New York in the 'nineties. Messages would be left for a man who was absent at lunch, bidding him ring up such and such a number on his return and ask for Mr. Fish. On his doing so, he would get the reply: "Which Fish do you want?—This is the Aquarium." The joke attained to such proportions that there also a special operator had to be detailed to inform enquirers what the telephone number in question represented and to ask whether the caller really wanted the Aquarium. Hoaxes of this order are, of course, not peculiar to or dependent on the telephone; long before it was invented the practical joker employed the post or other means of communication for the annoyance of his victim. It is probable that the first jokes of primitive man, before the dawn of true wit and humour, found expression in a practical form. At a much later stage of his development he still found especial pleasure in stories of personal discomfiture and of assault and battery, the magnitude of the joke being in direct proportion to the number of ribs broken in a beating, and even now the stout gentleman performing on a banana-skin is not without his admirers. Annoyance inflicted by anonymous channels, whilst it marks an advance on the breaking of ribs, is essentially mean, and we are glad to find does not always escape detection. Calling a maid away from a house with a story that her mistress is lying somewhere injured and requires her aid, and then taking advantage of the girl's absence to rob the house, is possibly something more than a practical joke, though in the same line of descent. But the reiterated employment of this device places people on their guard, and on a recent occasion a thief was smartly captured whilst employing this ruse. As the advertisement of abuses of the telephone encourages their continuance, so we may hope by proclaiming their failure to discourage them; for the telephone is too good a friend to be invested undeservedly with the false appearance of an enemy.

HIC ET UBIQUE.

WE commend to all telegraph men and women the report of the Telegraph Conference of the Union of Post Office Workers which has appeared in the last few numbers of *The Post*. No satisfactory solution can be found for the problems that confront official and staff sides alike unless each side appreciates the other's point of view. The report helps all who read it to realise the difficulties of the staff, and shows that the staff themselves are very far from blind to the difficulties of the Administration. We wish all success to the policy of co-operation that has now been inaugurated.

We learn as we go to press that it is expected to open a radio-telephone service between this country and Australia, available between all subscribers in Great Britain and subscribers in Sydney and Melbourne on April 30. The charge for a 3-minutes' call will be £6.

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Telephonic communication between Moscow and Berlin was opened last month. It is not available for the purposes of the Press, says the *Morning Post*, since the Kremlin fears that it would be impossible to impose a sufficiently rigorous censorship.

According to the *Exchange Telegraph* Bucharest papers report that the Roumania telephone monopoly is to be leased to the Swedish Ericcson Co.

An American magazine devoted to "efficiency" publishes a short anecdote, containing the following sentence :—

A hotel chambermaid was tipped half-a-crown not to give away the fact that a couple just arrived were newly married, following upon her having looked in their room and found them disposing of the confetti.

They might with advantage extend their efficiency to the writing of English. Or were the couple not married until after the maid looked into their room ?

The *Daily Mail* has discovered a new game in America. It says :—

Now that the dial system of telephoning has been pretty generally established in London, perhaps the latest New York drawing-room game of composing your own or your neighbour's telephone code number will be taken up here.

The game consists in making up the most striking or applicable or easily remembered "word" from the letters which correspond on the dial to the name of the exchange and the telephone numbers. If a good code word is composed it is far easier to memorise than the actual number. For instance, the telephone number Sloane 7549 can make the code name SLOPJIX.

Of course, there are about six alternative code words from which the final choice can be made, since any one of three letters can be chosen to represent each single letter or number. For A or 2, for instance, one can take one's choice between A, B, and C, all of which occupy the same dial hole. This makes the game protracted and amusing.

From the Western Union Telegraph Company's annual report for 1929 we note that gross operating revenues for 1929 exceeded those of the previous record year, 1928, by $9,217,682, or 6.8%. Cable revenues increased 9.6% ; the volume of traffic transmitted over the Company's ocean cables in 1929 exceeded that of any other year.

Operating expenses for 1929 were greater by $9,054,640. As a result of the reductions in overnight and week-end cable letter rates, there has been a substantial increase in the volume of deferred service over the North Atlantic system, and all classes of deferred services to and from U.S.A. have now been extended to Germany and Belgium.

In November a series of earthquakes in the ocean bed south-east of Nova Scotia caused unprecedented damage to ocean cables. By the use of other routes, the Company was soon able to restore satisfactory service pending the repair of the damaged cables.

Duplexing experiments were successfully carried out in connexion with the Company's high-speed cable laid in 1928 between Newfoundland and Horta, Azores Islands.

Direct cable operation was established in January, 1929, between New York and Berlin via London, effectively supporting the permalloy cable from New York to Emden, Germany. In September, a direct circuit from Broad Street, New York, to Shorters Court, London, was established, thus bringing the New York and London stock exchanges into almost instantaneous connexion.

PRIZE FOR DESIGN FOR THE COVER.

THE Editing Committee offer a prize of Three Guineas for a new design for the cover of the *Journal*. It should be of comparatively simple character and contain the words "The Telegraph and Telephone Journal." It should be reducible to the size of about 8 inches by 4.

Designs are invited from all members of the Post Office staff and should be submitted by July 25.

HOW TO IMPROVE THE TELEGRAPH SERVICE.

(Discussion held at Meeting of the Telephone and Telegraph Society of London.)

Mr. L. SIMON, Assistant Secretary (Inland Telegraphs), in opening the discussion, said :—

The subject of this discussion, as we have heard, is "How to Improve the Telegraph Service." I take it that what is meant is the Inland Telegraph Service. I am going to assume that I may ignore the sister service altogether, in spite of the fact that Mr. Phillips is in the chair. We had a discussion on this very subject—a printed discussion in the *Telegraph and Telephone Journal* last year, and I wrote what I called an epilogue to that discussion. A member of the service writing a criticism in another journal headed it "Epilogue or Epitaph ?" Well the only comment is—Epigram !

There is no call for pessimism in relation to the Inland Telegraph Service. It is true that the traffic is declining and may go on declining for some time, but in spite of that the Inland Telegraph Service obviously performs an indispensable function in the national economy and from the point of view of its usefulness there is no need to think of its epitaph.

Nor from its internal condition does there arise any need for an epitaph, because even at this advanced stage of the life of the telegraph service, after 60 years of its control by the State, we are in the middle of changes in apparatus and methods which are certainly far-reaching and which the historian of the future, looking back upon them, may describe as revolutionary. So I don't think the Telegraph Service is anywhere near its death.

Having written an epilogue last year, this time I am called upon to pronounce a prologue. I call my contribution a prologue designedly, because I don't want it to form any integral part of the discussion, i.e., I am not here to disclose to you my views, if any, on how to improve the Telegraph Service. I have been associated with the formulation of proposals which are designed to improve the Telegraph Service in certain aspects. These are embodied in the recommendations of the Commission which I had the honour to take out to America 18 months ago. They are at present under discussion, in process of being modified and re-moulded, so that they may turn out something appreciably different from the form in which the American Commission put them forward. For that reason alone I should not dream of repeating them here this afternoon. Also, apart from that, those recommendations touch only the internal organisation and methods of the service—they don't deal with important aspects such as public facilities and rates, and so forth.

Then I think I should incur another danger if I put forward definite proposals myself on this occasion. You remember Mr. Squeers of Dotheboys Hall telling the boy to spell "window." He spelt it "w-i-n-d-e-r." "Now," said Mr. Squeers, "go and clean it" ! If I put forward any suggestions, you might be disposed to say "Carry them out." Not that I could do so, but I might be regarded as committing the administrative heads of the Telegraph Service to some extent to the views I put forward. I shall therefore confine myself to an attempt to analyse what is meant by improving the Telegraph Service, pointing out some of the difficulties that must arise in any attempt to do it along a particular line.

If you want to know what is meant by improving the Telegraph Service you obviously have to consider first of all what we might call the constituent elements of the service from the point of view of the public who use it. What is it the public expects and has a right to expect from the Telegraph Service ? I think we may lay down these as the requirements :—

(1) Speed,
(2) Accuracy,
(3) Accessibility, and
(4) Cheapness.

I should like to say a few words about each, and to point out how they are all connected ultimately by considerations of expense.

As regards speed and accuracy, there may to some extent be a conflict even between those two apparently complementary requirements, that is to say, you might attain speed at the sacrifice of accuracy and on the other hand attain a high degree of accuracy at the sacrifice of speed. This is not an important point, because the speed of the Telegraph Service depends only to a minor extent on the speed of the actual signalling ; the reason for preferring speedier to slower methods of signalling is not really a desire for a greater speed of service from the point of view of the public ; the reason lies in other directions. The speed of the Telegraph Service depends on the arrangements for circulation and the provision of circuits and staff more than on the actual speed of signalling, so that there is no need in order to obtain the maximum possible speed of service to run the speed of signalling up to a point at which it tends to interfere with accuracy.

There is obviously an absolute standard of accuracy—that is 100%, whereas in settling a speed of service you are bound to lay down some more or less arbitrary standard as to what is a reasonable speed to aim at. We

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have our more or less definite standard of speed—namely, that no telegram should remain in one office in the course of transit for more than 15 minutes, with a concession of 5 minutes' grace in the case of the C.T.O. Is that a reasonable standard of speed or not? Ought the Telegraph Service to aim at being rather quicker than is implied in that standard? That is the serious question to decide before you make up your mind whether the service needs improving in respect of speed. In deciding that question, of course, you must take other considerations into account, e.g., whether you have or have not an "Urgent" service. You have also to consider whether we can afford what it would cost to give a more speedy service.

As to accuracy, I think there is nothing much to be said. As mentioned before, there is a 100% standard of accuracy and that is the least we can be content to aim at.

By accessibility I mean that the Telegraph Service should be available to all as regards sending and delivery. The ideal would be that everybody should have a telegraph service within half a mile or so; an office from which to send telegrams and from which telegrams could be delivered. No doubt this is Utopian, but once you realise you cannot give everybody a telegraph office at his door, it becomes a question how far you can get towards that ideal. If you are thinking of improving the service you must have some general idea of the standard to be aimed at in relation to the availability or accessibility of the service. If you set anything like a high standard you conflict with the other ideal of speed of service, because the more telegraph offices you have the wider your network is spread and the more difficult it must be to maintain any good standard of service without largely increasing the expense. I can illustrate that by a reference to what is often thrown in our teeth. People imagine it is a very effective criticism. You can send a telegram from Liverpool to London more quickly via New York than by direct route. The reason is perfectly obvious. The telegraph service from Liverpool to New York is a single point-to-point service. Perhaps I am exaggerating a little in saying that; but, at any rate, practically all that has to be done with a telegram handed in at Liverpool to one of the cable companies is to bring it to a circuit or a group of circuits and hand it to an operator to transmit it to New York. That is an entirely different affair from having hundreds and thousands of telegrams pouring into some office where they have to be sorted out and circulated to circuits serving all sorts of different towns and distant offices. The more you multiply the number of points in the system the more elaborate and time-wasting the process of sorting and circulation must become. From that point of view there is a conflict between the ideals of speed and accessibility, and as always it is the cash nexus which binds them together. The more money you spend on making the service more widely accessible, the less money you have to spend on staff and circuits and messengers which are necessary to maintain your ideal speed.

Then as to the point of cheapness, that is even more obviously connected with finance than the others. A cheap service is obviously a requirement of the user, who always wants everything as cheap as he can get it or more so. What is a cheap service? I suppose we should all say that the service of the sixpenny telegram days was a cheap service. Perhaps we should not agree that the 1*s.* telegram of to-day is a cheap service. Yet I think it is arguable that the 1*s.* of to-day is probably less than the 6*d.* of 1885 and not much more than the 6*d.* of 1910. I think you can fairly maintain that the 1*s.* telegram of to-day is a cheap service. Of course, the user would like it to be cheaper, and it is very difficult to find a means of judging how far you can go in making it cheaper. Why not make it 6*d.* or 3*d*? Why not go further and throw the whole cost of the telegraph service on to the taxpayer? It is difficult to find an absolute basis of decision as to what is the maximum of loss on the Telegraph Service which the taxpayer can reasonably be asked to bear. How far ought you to go in making the service cheaper to the user and more expensive to the Exchequer? I don't think there is any logical answer to that question. The practical answer can only be found by taking the point at which you happen to stand and saying—"At any rate we must try not to increase largely that deficit. If we do Parliament and the public won't stand it." Though we know the public would appreciate the cheapening of the telegram we have no reason to believe there is any very violent or urgent demand for it.

You will observe that I am implicitly accepting a deficit as something more or less inevitable. I do want to say a word about a cheaper telegram in connexion with the suggestion that is sometimes made that you can at one and the same time make telegrams cheaper to the public and reduce the burden on the Exchequer. We are told that if only you reduce the charge to 6*d.* you will get such an increase of traffic as will turn your deficit into a profit. Well, I quite understand outsiders making that suggestion, but I have been much pained to find it made inside the service, because it seems to me that it will not stand a moment's consideration of actual facts. The ordinary inland telegraph service now handles 41 or 42 million telegrams a year. The highest figure we ever had was about 90 millions. If you halve the charge for the telegram, you have got to double the number of telegrams before you get the same revenue, so that you would need 84 millions. To work at a profit you must make something more. So that in order to be in as good a financial position as we are now, if we had a sixpenny telegram we should need to exceed the highest traffic of the days before telephone competition was so severe. But then a much larger staff would be required, and that would put up the cost. The two ends could never meet. Public policy might perhaps justify a reduction of the present charge, but at least let us not be told that by reducing the charge to 6*d.* we may wipe out the deficit or reduce it. It is quite clear that if the deficit is to be reduced at all by the manipulation of rates, it is in the upward direction we should have to move and not the downward. Whether the public or Parliament would stand an increase in the tariff it is difficult to say; some day we may be in a position to try this course, but I cannot say it is in sight at present.

I am afraid my remarks have been somewhat discursive, but the point I have been trying to make is that in putting forward suggestions for the improvement of the Telegraph Service in relation to speed, accuracy and accessibility, you have to consider whether an improvement on one side can be carried out without involving a corresponding degradation of the service on another side, because money spent (e.g.) in increasing the speed of service will increase the deficit unless we can save a corresponding amount by closing unremunerative telegraph offices, &c. You must look at the question as a whole, and it is impossible to deal with any single suggestion in isolation because of the financial element which is always in the background. The deficit has shown a gratifying fall in the last financial year; it is substantially lower than it was. We are still, however, far from being in the happy position of having money to spend. Anybody can say: You ought to have a 10-minute standard instead of a 15-minute standard, and a telegraph office at every half-mile; but that does not carry you very far unless it can be shown that these things can be done without any substantial increase of cost.

I may, indeed, be told: If you improve the service you will get more revenue and that will take the place of the savings. As to that I confess myself sceptical. All the evidence I have does not bear out the view that if you improve the service you will get increased traffic. The service has been definitely improved in several directions during the past year. Last July the hours of telegraph business were extended, so that in any town area you can now hand in a telegram till 9 p.m., and if you are in a town area and a telegram addressed to you comes after the hour of closing of the public office and before 9 p.m., that telegram will be sent out to you by a postman. Then a telephone subscriber or caller sending a telegram does not now have to pay a trunk fee in certain circumstances, as used to be the case. I need not dilate on the abandonment of the requirement that the sender of a telegram should lick the stamps—that is the removal of a minor irritation which has been carried out within the last year or two. Further, we have been keeping offices open longer on Bank Holidays during last year, and so public facilities have been improved. At the same time, the speed of the service has very definitely improved. Comparing the position to-day with that of a year ago, the improvement is quite marked. I have one or two figures. Some 18 months ago we set up a system of hourly reports from zone centres on the traffic position on the main routes. If the delay has reached as much as 15 minutes—that is, the first telegram waiting to be sent has been as long as 15 minutes in the office—it is reported. The number of these reports in 4 weeks of February, 1929, ranged from 855 to 949 a week; in February last they ranged from 142 to 172—a very evident decrease in delays in all those offices, through which 80% of the traffic passes. In January, 1929, 30% of the traffic of the Central Telegraph Office was dealt with in less than 15 minutes, in 1930, 55%. The corresponding figures for other large offices were 77% in 1929 and 87% in 1930. This indicates a definite improvement in the speed of the service during the last month or two as compared with the corresponding period a year ago. Yet in spite of these improvements in facilities and in speed of service, the fall of traffic was at least as marked in January and February this year compared with the previous year as in 1929 compared with 1928. There is no indication that these improvements have had any effect whatever in retarding the fall of traffic.

Of course, it may be said that trade conditions are bad, and that if not for these improvements the fall would have been greater. But the facts as I see them give no ground for the contention that if only you improve the service you will get increased traffic and thereby increase the revenue. I am convinced that if we are to spend money on improvements—in speed, or accessibility or in any other way—without increasing the deficit, we shall have to show that we can save money somewhere else.

There is another consideration that has to be taken into account in connexion with suggested improvements—I mean the interests of the staff—the actual telegraph staff—the manipulative staff and their immediate supervisors who run the Telegraph Service and are at it day and night. It is possible, from the point of view of the public, to make demands on the staff which may be excessive from the point of view of those who have to do the work, and I think that has to be borne in mind. There again the financial aspect comes in obviously, for if you thought that in the public interest every telegraph office ought to be open from 6 a.m. till midnight, you could not secure that without working the existing staff overtime or spending sufficient money to double the staff. Minor improvements all mean increasing work. The question whether the advantage to the public really justifies adding to the burdens of the staff cannot be disregarded.

That leads me to one other thing I want to say in conclusion. I am convinced we have in the Telegraph Service a staff capable of meeting all demands made on it. If our service is less than perfect in some respects, as no doubt it is, it is not because we have not got the material to give a good service. One of our problems is to stimulate and keep alive in the rank and file of the telegraph service that keenness and interest in their work which is necessary if they are to do their best. In a declining service that is a difficult problem. If we can solve that we have a body of men and women who are capable of giving a Telegraph Service as good as any country in the world could desire.

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Mr. F. W. PHILLIPS, Assistant Secretary, Overseas Telegraphs (The Chairman), said :—

I should like to refer to Mr. Simon's reference to the scope of the debate. I think the Committee had in mind particularly the Inland Service—but that is not to say that the Overseas Service is not open to improvement ! We are free to debate both.

I have sometimes been struck by the tremendous amount of criticism the Post Office gets in relation to all its services, perhaps more in relation to the Telegraph Service than any other. The Telephone Service runs it very close. It is comforting to me when I am reading criticisms of the Post Office to reflect that at any rate the Post Office were the first to introduce a really successful wireless service. What was the secret of the success of the Empiradio service which the Post Office developed ? I think in one word it was—Enthusiasm. There is not the slightest doubt that in this service as in the Imperial Cable Service a great deal of enthusiasm was shown on the part of all members of the staff from the highest to the lowest.

The position of the Imperial Wireless Services was different from that of our other services I know, but I have always considered whether it would not be possible to throw a little of the same enthusiasm into other branches of the Telegraph Service. It is difficult where you have an old and declining service to be as enthusiastic as in the case of a new and growing service. I was glad when the Empiradio Services were transferred to the Communications Company that the Department decided to continue the canvassing system both on the Overseas and Inland Telegraph Services ; I am sure it will do a great deal of good. I am an absolute believer in canvassing and I think by its means a good deal can be done to stimulate traffic.

One thing we have done as the result of our experience on the Empiradio services, we have now persuaded the Treasury to let us give free credit accounts both for overseas traffic and inland. That will be announced shortly and will place our canvassers in a position to go to firms and press them to open accounts with Post Offices where they can send telegrams to any address in the world without prepayment. I am sure the opening of accounts of that kind will be very useful—it enables a canvasser to " nurse " firms and in the long run it will I think do good to both the Inland and Overseas Services.

Mr. J. STUART JONES (Controller, C.T.O.) said :—

The urge to improve the Telegraph Service, as indicated in the discussions of this Society and in the articles in the *Telegraph and Telephone Journal*, is, I think, a phenomenon of recent years. I suppose that this urge has proceeded from the fact that the decline of inland traffic during the past ten years has got rather on our nerves and there is a feeling at the back of our minds that possibly we have omitted to take measures which might have averted the decline. I doubt whether the decline could have been arrested. Of course, it can be argued that a telegraph service of poor quality drives the public into other channels of communication, but I don't think there is any evidence whatever that the Telegraph Service is or has been of such poor quality as to contribute in that way to its own decline. And I am inclined to disagree with the Chairman in thinking that there is a public outcry against the Telegraph Service. There are, of course, complaints, but they are not numerous in relation to the amount of traffic and one does not often see denouncements of the Telegraph Service in the Press.

I take it that our job in the Telegraph Service is to provide the public with the service it wants and that it is our duty to interpret what the public wants and try and satisfy those wants. Our duty seems to be three-fold :—

(1) To find out what are the defects of the service and to remedy them ;

(2) To attract more traffic ;

(3) To improve the financial position of the service.

The last point, that of finance, seems to me to be the most important at the present time. An undertaking such as ours which shows a large annual deficit must cause uneasiness in the minds of those responsible for the administration of the service, just as any honest person must be uneasy if he cannot meet his liabilities. The Telegraph Service, however, has really two functions :—

(1) To provide the service required for business interests ;

(2) To perform certain national services which are outside the range of purely business requirements.

The first part ought to be run as a business undertaking and should be made to pay its way. The second part of the service is bound to be unremunerative. The State, as a matter of policy, provides telegraph service at a very large number of small towns and villages where the traffic is so small that the service is bound to be carried on at a loss. I suggest that the loss incurred in performing this national service, which would never be undertaken by a private company, should be assessed and that the Telegraph Service should be subsidised to the extent of that loss. The business side of the Telegraph Service, however, ought not to be subsidised. As a taxpayer I have a strong objection to such a subsidy. If, as a taxpayer, I have to help to subsidise any public utility, I would rather do so for coal or wheat or something more valuable to the community as a whole than a telegraph service which is used by a comparatively small number of people.

As regards putting the service on a better financial basis, the last 12 months have shown a great improvement in this respect, and I think the salvation of the Telegraph Service will lie in the introduction of high-speed machines and in the training of the staff to greater skill. There is little waste in the Telegraph Service, and if we do all we can to improve the machines and the skill of the operators it will do much towards placing the service on a better footing in every way.

As regards defects of service, there is really very little to find fault with in the present service. The time taken in delivering telegrams after transmission is the weakest point, and I think that money spent on a more expeditious delivery would be well worth while. Public complaints are directed more against the time taken to deliver telegrams than anything else.

As regards attracting more traffic, it is possible that expedients such as advertising might do some good, but the present slump in traffic is due to bad trade conditions and increased traffic can only come when the trade of the country is in a better state.

(An interesting discussion ensued in which Messrs. Sharp, Young, Davis, Ritter, Colliver, Highet, and Gibbon took part.)

LEEDS DISTRICT NOTES.

By the time these notes appear we shall have bid our official farewell to Mr. J. H. Goodwin, Assistant Traffic Superintendent, on the District Manager's staff.

Mr. Goodwin commenced his official career at Derby in January, 1882, was appointed Telegraphist in 1885, and dates his association with telephone work from 1892, when he was employed in the Derby Exchange. He was appointed to the Leeds staff in October, 1914, and was closely associated with all the traffic aspects of the transfer of Leeds to automatic working

MR. J. H. GOODWIN.

in 1918. Of a kindly disposition, he was ever ready to place the vast store-house of his knowledge, particularly of Departmental rules and regulations, at the service of his colleagues. While we intend to express our regard for Mr. Goodwin in a tangible form in the near future, we feel that tribute must be paid in these notes to the Darby and Joan affection which in recent years influenced Mr. Goodwin to decline promotion on two occasions for domestic reasons. The many friends of Mr. Goodwin will agree that no picture of him could be complete without his white neck-tie threaded through a gold ring, and we are glad this characteristic is so clearly reproduced in our photograph.

On April 4 last, in the presence of a large number of the staff, Mr. A. Ryder, Higher Clerical Officer in the Superintending Engineer's Office, was presented with a pewter tea service on the occasion of his retirement under the age

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limit. The Chair was taken by Mr. S. A. Pickering (Staff Officer), who was supported by Mr. J. W. Atkinson (Superintending Engineer) and Mr. T. B. Johnson (late Superintending Engineer). The Chairman and a number of those present spoke of the esteem and goodwill in which Mr. Ryder was held, one and all wishing him, and also Mrs. Ryder, the best of health and good luck during his period of retirement. Mr. Atkinson formally made the presentation, after which Mr. Ryder suitably replied, thanking all for their good wishes.

Mr. Ryder's service has been somewhat unique for the Engineering Department, he having spent the whole of his official career at Leeds. He entered the service at the Head Post Office in 1885 and was appointed S.C. & T. on Jan. 1, 1886. On Mar. 1, 1898, he was, however, transferred to the Engineering Department at Leeds as a clerk, ultimately becoming Higher Clerical Officer, which position he held up to his retirement.

Mr. H. H. Padgett, Clerical Officer in the Superintending Engineer's Office, retired under the age limit on Mar. 31 last. Mr. Padgett entered the service of the late N.T. Co. at Leeds, in July, 1901, and was transferred to the Superintending Engineer's Office in January, 1912, when the Telephone Service was taken over by the State. As a token of the esteem in which he was held Mr. Padgett was presented with a clock, and also with a ladies hand-bag for Mrs. Padgett. Unfortunately, Mr. Padgett's health has not been of the best for the past few years, and on this account the presentation was made privately by Mr. Atkinson (Superintending Engineer). The best wishes of his colleagues are extended to him, coupled with the hope that with rest his health will be restored and that he and Mrs. Padgett will be spared many years to enjoy his retirement.

We regret to announce the death of Mr. E. A. Dobson (Sectional Engineer's Office, Leeds) on Mar. 28, after a short illness. Entering the Post Office as a Learner at Leeds in 1903, he gave good and faithful service in the Telegraph Branch until 1924, when he was appointed Clerical Officer in the Engineering Department, a post he held at the time of his death. During the war he was for four years in the R.E. Signals and saw active service in East Africa. He was of a quiet, unassuming disposition, and the esteem in which he was held was shown by the floral tributes and the presence of many representatives of the Sectional Engineer's and Post Office staffs who assembled to pay their last respects at the church and the grave-side.

Leeds Telegraph Messengers' Concert and Prize Distribution.—The Albion Hall, Leeds, was crowded on Wednesday evening, Mar. 26, when the Annual Concert and Prize Distribution in connexion with the Boy Messengers' Institute took place.

Lt.-Col. Jayne, D.S.O., O.B.E., M.C. (Postmaster-Surveyor), presided, and was supported by Messrs. J. W. Atkinson (Superintending Engineer, North-Eastern District), J. Bownass (Assistant Postmaster), T. A. Bates (District Manager), C. H. Mansell (Chief Superintendent, Telegraphs), several of the Head Postmasters in the West Yorkshire District and Supervising Officers from other Departments.

An unusually attractive and varied programme was highly appreciated by the company—the items evoking most applause being mouth organ duets of classical airs rendered by two of the messengers.

Prizes, which had been provided by Lt. Col. Jayne, Messrs. J. Bownass, C. H. Mansell, F. Senior, and the Telephone and Instrument Room Staffs, were presented by Mrs. Jayne to boys who had attained educational successes and excelled during the past year in personal qualities, general efficiency, cleanliness and smartness.

During the evening Lt.-Col. Jayne enlarged upon the avenues of promotion in the Post Office open to Boy Messengers and urged the necessity for parental co-operation, particularly in respect of the educational aspect, in assisting the Department to fit the boys for the higher posts awaiting them.

The general smartness in appearance of the messengers present at the concert was the subject of many favourable comments by members of the public who were in the audience.

TRAFFIC SECTION DINNER.

APRIL 1 is notoriously a day when even the most dignified may unbend without loss of status, and the members of the Headquarters Telegraph and Telephone Traffic Section, who selected this date for their Annual Dinner, made full use of the liberties and privileges of the day. The dinner took place at the Loudoun Hotel, and was unlike any other official function in the history of the section. Rank and precedence were set aside and members of all grades mixed on the most democratic terms round the table. The popularity of the innovation was evidenced by an almost hundred per cent. attendance of members of the section.

The motto of the promoters appears to have been "Liberty, Equality, Fraternity," and such was their fervour for this noble principle that the selection of Chairman and speakers to the many and unusual toasts, was determined by drawing the names from a hat. The speakers were caught unawares, in a moment of natural expansion, and expressed themselves in their native and woodland notes.

The choice of Chairman fell on Mr. Gillett, who fully justified the remark of a colleague that in certain circumstances he would be the life and soul of the evening. He was; he caught and personified the mood of the assembly, which constitutes ideal chairmanship. No occasion found him without an appropriate quip, and his duel with one of the speakers, who at length enquired whether it was a speech or a dialogue, was one of the brightest moments of the evening.

Before sitting down to dinner the members divested themselves of all official decorum by solemnly donning paper hats: It was a symbolic act. The menu was continually interrupted by the reading of telegrams, which arrived from all quarters, and did not appear to be conceived in the most serious vein, particularly the one advising an Aberdonian who was present that his golf ball had been found, and asking if the instructions to sell his club should be cancelled.

The programme following the dinner was of a very varied and interesting description, and was as notable for the items announced from the chair which did not materialise as for those that did. The toasts fell into very good hands. Mr. Stuart Jones moved that of "Ourselves" and Mr. Stewart responded, the whole company heartily endorsing by singing—"For we are jolly good fellows, which none of us can deny." "The Scots who left home" was moved by Mr. Fright, and Mr. Anderson who responded entered into the history and philisophy of the great trek in an inimitable way.

The singing of Mr. A. Hemsley and Mr. J. Whiffen was of a quality that called forth hearty appreciation, and Mr. F. Riley proved to be an accomplished entertainer at the piano. Mr. W. H. Oxlee exploited a rich vein of humour in his comic songs, and Mr. J. C. Craven told some tall stories with refreshing candour. The occasion was marked by the first appearance in England of Li Chang Lung—a Chinaman of placid exterior with a Scottish accent, who in association with Mr. Hemsley gave a remarkable exhibition of thought reading, which it is thought the Telegraph Section intend to develop as a means of communication.

Perhaps the most popular feature of the programme was the community singing of original verses dealing with Traffic Section personalities. The soloists were chosen haphazard regardless of their vocal abilities, and their embarassment was only equalled by the amusement of their colleagues. A song to the tune of "Clementine" dealing with the official struggles of various members of the section was greatly enjoyed, the company entering with extreme unction into the singing of a chorus at the end of each verse which ran:—

"Aint it shameful? Aint it awful?
Aint it all a blinkin' crime?
How they worked, and all for nuffink!
All for nuffink, every time!"

The Telegraph Section, a small but resolute band, sang a little oratorio in praise of the Telegraph Service, which betrayed a note of optimism in the final verse:—

(*To the tune of* "*My Bonny.*")

No. 1.

"The telephone crosses the ocean,
By wireless it crosses the sea,
Its doing its best to keep up with
The old art of Telegraphy."

No. 2.

"We still are a happy division,
With chances and prospects galore,
Tho' Graham Bell and now television
Are knocking like wolves at the door."

No. 3.

"We found that the Baudot did help us,
And Murray again gave the lead,
From victory to victory we triumphed
And found our salvation in Creed."

No. 4.

"So now we can carry on smiling,
And keep the old country intact,
When dials and selectors go wonky,
We've got the old telephone whacked."

Chorus.—"Give back, Give back,
Give back my traffic to me, to me,
&c., &c."

During the evening the prizes for the Section Billiards Championship were distributed, the recipients being:—

Mr. R. M. Musche—1st Prize.
„ A. W. White, 2nd „
„ C. S. Earle, Highest break.

The evening was indisputable evidence that traffic problems do not sour a man's nature, and that the Traffic Section do not take their pleasure sadly.

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A BRIEF CHRONOLOGY FOR STUDENTS OF TELEGRAPHS, TELEPHONES AND POSTS.

By HARRY G. SELLARS.

(*Continued from page* 146.)

1897, June 22 ... Postage of letters reduced to 1*d.* for the first 4 oz. and ½*d.* for each additional 2 oz.

1897, June 30 ... Telephone cable designed by Willoughby S. Smith and W. P. Granville laid between the Isle of Wight and Hampshire.

1897, July ... Marconi Wireless Telegraph Company formed.

Marconi introduced an arrangement by which decoherence of the filings in a wireless coherer was effected by a small hammer tapping the tube. This hammer was actuated by an electro-magnet brought into circuit with a small battery each time the current from the main battery passed through the coils of a morse receiver.

Marconi carried out wireless trials across the Bristol Channel.

Sir Oliver Lodge took out a patent for Syntonic Wireless Telegraphy in which he obtained more prolonged oscillation and better selectivity.

(Ducretet established wireless communication between Rue Claude Bernard and Boulevard Port Royal, Paris—about 500 metres distant.)

1899 ... ... Number of telegrams dealt with during the year, 90,000,000.

Net Postal Revenue, £3,710,336.

Loss on Telegraphs, £587,452.

Deficit on Post Office Savings Bank during last three years, £34,123.

1900, Jan. 1 ... Eastern and South African Telegraph Company granted subsidy for 20 years for laying three South African cables.

Atlantic cable laid for Commercial Cable Company.

Committee appointed to consider question of cable communication with the Empire. Members: Lord Balfour of Burleigh (Chairman), Marquess of Londonderry (Postmaster-General), Lord Hardwicke (India Office), Lord Onslow (Colonial Office), R. W. Hanbury, M.P., Gen. Sir John Ardagh (War Office), and Admiral Custance (Admiralty).

National Physical Laboratory founded at Teddington.

Telegraph companies suggested to the Cable Communications Committee that treble rates should be charged for "urgent" messages, which would be given priority.

Emilio Guarini, of Trani, introduced a relay, or repeater, which, used in conjunction with a coherer, retransmitted received wireless signals.

Marconi patented coupled wireless circuits which enabled more energy to be transmitted and greater selectivity to be obtained.

Wireless communication established between Rathlin Island and the mainland and between Anglesey and the Skerries.

Sir Oliver Lodge published his work "signalling across space without wires."

1900, Feb. ... Rowland page printing multiplex telegraph system exhibited at the Paris Exhibition.

Post Office Wheatstone A.B.C. apparatus replaced by telephones where practicable.

First exchange providing full automatic trunking facilities installed at Bedford, Massachusetts. Ten thousand subscribers could be accommodated.

Electro-magnetic relay adopted for telephone switching.

Reginald Fessenden succeeded in transmitting speech without wires over a distance of one mile.

W. Duddell devised a method of producing continuous oscillations by an electric arc.

1900, May ... Subscription for connexion with telephone exchanges fixed at £7 10*s.* for first half-mile and £1 5*s.* for each additional quarter-mile, with unlimited calls on subscribers in the same area. A message-rate system was also established under which a subscriber paid a fixed annual sum for his installation and, in addition, a fee for each local call originated.

Evershed introduced an Ohmmeter from which the "Megger," for measuring insulation and conductivity, was evolved.

John Gell constructed a typewriter keyboard tape perforator.

Prof. David E. Hughes died.

G. F. Mansbridge patented a condenser in which tinfoil paper took the place of metallic foil and paper.

Creed introduced a telegraph receiver which produced perforated tape identical with that used at the transmitting end. He also produced a pneumatic telegraph printer, with slide valves controlling pistons actuating typewriter mechanism and printing on paper tape.

(Harold Bille designed a morse telegraph transmitter modifying that of Wheatstone and an electric receiving morse perforator.

Willson introduced a telegraph receiving perforator combining the devices of Creed and Bille.

J. W. Willmott devised an automatic Wheatstone transmitter with a magnetic bias, and designed a new form of punch for Wheatstone perforators.

P. Mulligan, E. V. Smart and C. C. Vyle fitted electric motors to automatic Wheatstone transmitters.

Vyle devised a differentially wound polarised telegraph sounder, and, with Smart, worked out a system of duplex.

C. E. Hay also devised a system of duplex for short circuits.

A. W. Martin suggested improvements in quadruplex arrangements.

A. Eden invented a "Sounder Silencer," for use at relay stations, which was developed by H. R. Kempe and A. J. Stubbs.)

1900, July ... Fee for official redirection reduced to 1*s.* per annum and the period limited to three years.

£120 limit for letter insurance extended to British possessions and India.

Murray introduced a speed correction for phonic wheel motors of multiplex telegraph distributors.

(*To be continued.*)

INTER-DEPARTMENTAL GOLF COMPETITION.—P.O. (LONDON) GOLFING SOCIETY.

SECRETARY'S OFFICE *v.* ACCOUNTANT-GENERAL'S DEPT. AT BANSTEAD DOWNS GOLF COURSE—MAR. 24, 1930.

Singles.

S.O.		A.G.D.	
R. J. P. Harvey	1	C. Cross	0
W. E. Weston	1	A. J. Ratcliffe	0
W. R. Birchall	1	H. Buckland	0
P. W. McIntyre	0	S. W. Briggs	1
H. H. Kilby	1	P. S. Pert	0
D. Macgregor	½	G. Baker	½
J. Scholes	1	W. L. Gartland	0
W. H. Smith	1	W. H. T. Porter	0
H. E. Gallaher	0	A. Smith	1
R. P. Crum	1	H. E. Eckford	0
R. H. King	1	C. H. Sainsbury	0
H. L. Pearce	1	Sir H. Bunbury	0
	9½		2½

Foursomes.

Harvey and Weston	1	Cross and Pert	0
Birchall and Crum	1	Buckland and Eckford	0
McIntyre and Scholes	0	Gartland and Briggs	1
Kilby and King	1	Ratcliffe and Sainsbury	0
Macgregor and Smith	1	Baker and Porter	0
Gallaher and Pearce	0	Smith and Young (Banstead)	1
Total	13½	Total	4½

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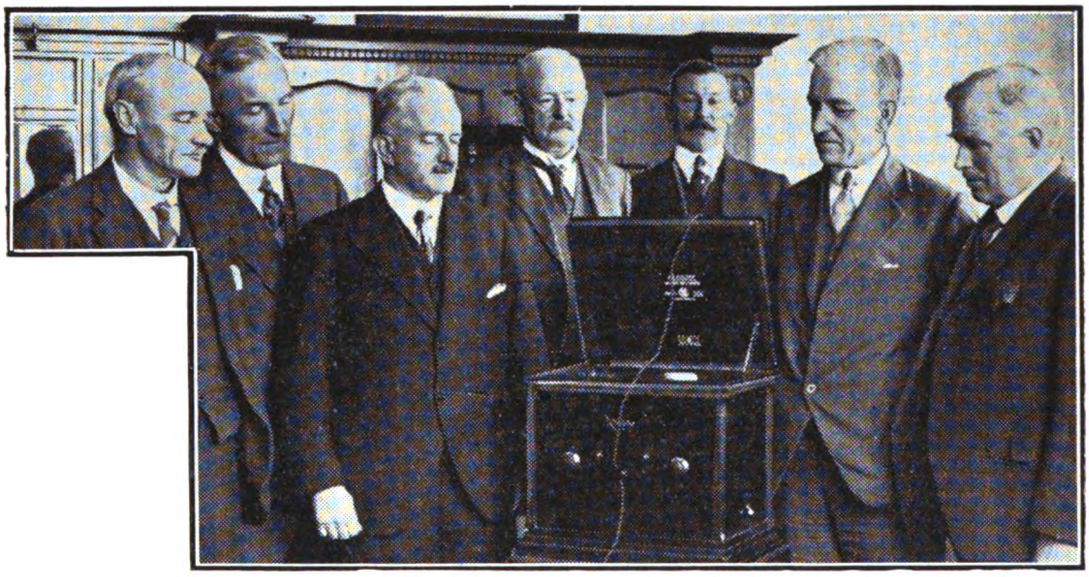
RETIREMENT OF MR. ROBERT AITKEN.

A LINK WITH OLD NATIONAL COMPANY.

A DISTINGUISHED statesman, referring the other day to the Government Telephone Service, said they had men on their staff who might be said to have followed the telephone from its cradle, and were still ahead with all the latest marvels of wireless telephony. He might well have been describing the life of Mr. Robert Aitken, M.I.E.E., Superintending Engineer for the West of Scotland District—a district which extends from Carlisle to the Outer Hebrides, and eastwards from Glasgow to Linlithgow—who has just retired from the Service after a distinguished career. In connexion with his severance of office, Mr. Aitken, at a large and representative gathering of the staff, presided over by Mr. R. Cunningham, was presented with a handsome 3-valve Madrigal wireless set and loudspeaker in recognition of his long service and also as an appreciation of the staff's esteem and affection. The presentation was made by Major John Cameron, O.B.E., M.I.E.E., Assistant Superintending Engineer.



[*By kind permission of the "Bulletin," Glasgow.*

MAJOR CAMERON. MR. R. AITKEN.

A native of St. Andrews, Mr. Aitken is laying down the reins of office owing to the operation of the age limit. Looking back at the milestones of life he has passed—and it may be recalled that he has given many young men heartening to make some of their milestones in time of stress—it can be said that this gentleman from the "Capital of Golfland" has helped to build up and extend the British telephone system. He has links with the old service, and many interesting recollections of these far-off days when a telephone in some country villages was looked upon as something just a little uncanny.

Mr. Aitken has knowledge of the earliest forms of telephone instruments as well as of the very latest. He joined in 1891 the National Telephone Company, and two years later he was transferred to its engineering department. He was what is known as "a young man o' pairts," and by 1896 he was chosen to go on a tour of the country with Mr. Dane Sinclair, the Manager of the National Telephone Company, and Sir John Gavey, in connexion with the valuation of the trunk telephone circuits prior to their transference to the Government.

Mr. Aitken was also responsible for the preparation of all the early traffic and underground schemes carried out by the National Telephone Company. When the Post Office entered into an agreement to rent the underground plant to the company in London, all the arrangements on the Company's side were made by him. Prior to the transfer of the National Telephone Company's local lines to the Post Office in 1912, he was in charge of the Company's headquarters staff in London engaged in the inventory and valuation of the plant. When the transference to the Government took place, Mr. Aitken joined the staff of the Post Office Engineer-in-Chief in London as Assistant Superintending Engineer and was promoted in 1926 Superintending Engineer to the West District of Scotland.

In Mr. Aitken's early days in London he was an enthusiastic Rugby football player and also a great pedestrian. His hobbies at the present time are wireless and walking—the two "W's." While a non-smoker, he has been known, as a cautious Fifer, to take a little whisky with his haggis, but never known to drown it. In Caledonian circles in London and at Clan gatherings and concerts Mr. Aitken was well known, but unless to his intimates, he was regarded as a typical Scot who heard everything but said very little. Mr. Aitken will be missed in Glasgow, but he has the best wishes of many in his retirement. It is not known if he intends to go back to St. Andrews in order to qualify for some of the big prizes in golf.

C.T.O. NOTES.

Promotions.—Miss E. Bailey, Telephonist to Assistant Supervisor; Messrs. E. B. Matthews and W. G. Howson, Telegraphists to Overseers.

Retirements.—Messrs. W. Wood, Overseers, T. J. Lunn and H. E. Patten, and Miss C. Willmott, Telegraphists.

C.T.O. Veterans.—The Ninth Annual Dinner of the Veterans' Association was attended by about 80 gentlemen drawn from the active and retired sections of the office. Both the Controller and Deputy-Controller were present. A very happy evening was spent by all.

The City of London Male Voice Choir.—This choir assisted in the aid of that most deserving charity—especially as regards TS—the Alexandra Orphanage, and all who attended experienced a musical treat. Besides the choir, Miss M. Busby, the well-known soprano, Miss Marie Wilson, violinist,

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and Parr and Jennings, of "Ours," gave of their best. The Orphanage funds will materially benefit by the result of the concert.

C.T.O. Library.—The Annual Report and Balance Sheet for 1929, whilst not able to show record figures, still indicates that the library is one of the most popular institutes of the office. Over 1,200 books were purchased, besides rebindings, and members are happy to known that for every 1*s.* received in subscription 10½*d.* is spent in new books and rebindings.

Dramatic.—"*The Last of Mrs. Cheyney.*"—The C.O.D.O.C. production of Frederick Lonsdale's play was highly successful. When an amateur club undertakes a West End production one is keenly interested, not in the comparative sense, but rather in the method of handling the play. The part of Mrs. Cheyney is an extremely difficult one, but in the capable hands of Miss Blodwyn Pugh, the portrayal left nothing to be desired. Miss Pugh throughout the play sustained the character in a polished manner. Mr. Percy Loeber, as Lord Dilling, gave his usual efficient performance of a part that was not too easy, but at times one was apt to gain the impression that he was a little too sharp in his replies. Mr. Charles Phillips depicted the character of Lord Elton extremely cleverly, and as Charles, Mr. Percy Richards obtained the nicety of balance that was required. As Lady Frinton, Miss Gertrude Mathieson gave a splendid performance, she was a typical society "lady." Miss Hood's portrayal of Mrs. Ebley was rather lacking in distinction. The remainder of the cast were excellent, and it is only space that does not allow one to criticise each player individually.

C.O.D.O.C.—The total active and honorary membership of the club now totals 350, an increase of 30 since the commencement of the season.

During the five years the club has been in existence 34 performances have been given, and 16,900 tickets sold.

The Committee takes this opportunity of thanking all patrons and members for their support and co-operation during the past season.

The Civil Service Arts Magazine is now available. This issue contains full reports of C.O.D.O.C. productions during the present season. Copies may be obtained from Mr. A. W. Eagland, C.T.O.

Programme for Season 1930/31.—The Operatic Section will produce "A Country Girl" at the Guildhall School of Music, Oct. 14, 15 and 16. Second production—Feb. 3, 4 and 5.

Dramatic Section.—Next production, Dec. 3 and 4. Second production, Mar. 18 and 19. At the Cripplegate Institute.

MANCHESTER NOTES.

Telephone House.—The occupancy of Telephone House is now assuming large proportions. During the week ended Mar. 29 to April 1 the East and West Sections of the Engineering Department moved in together with the concomitant Stores Section. The advance guard (numbering 50) of Supervisors and Telephonists for training in the method of operating in the new Toll Exchange have also taken up their quarters here. It is also expected that in a few months' time the Divisional Offices of the Ministry of Labour will be established in the building.

Resignations.—Miss A. Atherton, Writing Assistant, Accounts Section, resigned on the occasion of her marriage and was presented with many useful personal presents, together with a canteen of cutlery from the D.M.O. Staff.

Miss B. Hobson, Writing Assistant, Traffic Section, was also the recipient of numerous presents from her friends in the office, together with a case of fish eaters and a case of cutlery from the D.M.O. Staff on her resignation from the service on the occasion of her marriage.

Another link with the late National Telephone Co. was severed on April 2, when Mr. A. Harris, Contract Officer, Class I, retired under the age limit. He entered the service of the late National Telephone Co. in February, 1906, soon after the establishment of the Contract Sections, and was promoted Contract Officer, Class I, in April, 1920.

Mr. Harris was an enthusiastic member of the Volunteer force for a number of years, retiring on the formation of the Territorial Force with the rank of colour sergeant; he was an excellent shot, competing at the N.R.A. Meeting at Bisley on many occasions, winning the Bronze Medal in 1892, when he was a private in the 2nd Volunteer Battalion, Manchesters. In 1916 Mr. Harris joined the forces as Instructor of Musketry and served in various parts of England and Ireland. He was promoted Staff Sergeant Instructor very soon after he joined up and was demobilised in 1919. At a gathering of the D.M.O. Staff he was presented with a gold watch and a canteen of cutlery as a mark of the affection and esteem in which he was held.

All our good wishes go with him on his retirement.

Promotion.—Congratulations to Mr. T. E. Herbert, Assistant Superintending Engineer, who, on the retirement of Mr. W. J. Medlyn, Superintending Engineer for the South Lancs. Engineering District, on June 1 next, has been promoted Superintending Engineer, also to Mr. J. F. Fletcher, Sectional Engineer (Manchester West) on his promotion to Assistant Superintending Engineer, vice Mr. Herbert, and to Mr. T. T. Partridge, appointed Assistant Superintending Engineer vice Mr. A. J. Eames, retired under age limit as from 10th inst.

Social.—We also tender our congratulations to Mr. R. J. Broadbent, Assistant Traffic Superintendent, Manchester, on his winning the Chess Championship of Lancashire.

A very successful wind up social evening organised by the Social Committee of the District Manager's Office was held on the 10th instant, at which about 200 members of the Staff were present. A first-class programme of dance music was furnished by the "Quixotics," and an exhibition of eccentric dancing was given by Mr. Whitehead, all present were enthusiastic at the excellent fare provided; with many expressions of regret that the season of social functions had come to an end.

It should be stated that the series of gatherings of this nature which have been organised during the winter have been most successful and it is hoped the Social Committee will continue the good work next season.

NOTTINGHAM LADIES' HOCKEY TEAM.

THE Nottingham Civil Service Ladies' Hockey Team accomplished a very good performance in the Civil Service Ladies' Hockey Tournament promoted by the Civil Service Women's Hockey Association at Chiswick on Saturday, April 5. After a series of keenly contested matches they reached the final by a win over the Ministry of Labour side in the Semi-Final. They were defeated in the Final by the Ministry of Health.

Top Row:—G. Spriggs (D.M.) (Organiser); N. Searcy (Inl. Revenue); D. Vine (P.O.); M. Waite (D.M.); J. I'Anson (D.M.); P. Hawley (D.M.); E. M. Reddish (D.M.); W. Duke (Engrs.); Stephen McFadden (Referee and Coach).

Bottom Row:—K. Barton (D.M.); K. Keatley (D.M.); M. Collins (D.M.); D. Lowater (Engrs.); M. Jones (Min. of Lab.).

(*D.M.—District Manager's Office*).

The achievement of the Provincial side is all the more praiseworthy as the team has only played together for a few weeks. It is felt that they have made a very creditable show at the first attempt. On the next occasion when visiting Chiswick, they hope to do better. They were the only provincial side competing.

Civil Service Sports has already established a strong hold at Nottingham and under its encouraging auspices, Tennis and Swimming will be popular features this summer.

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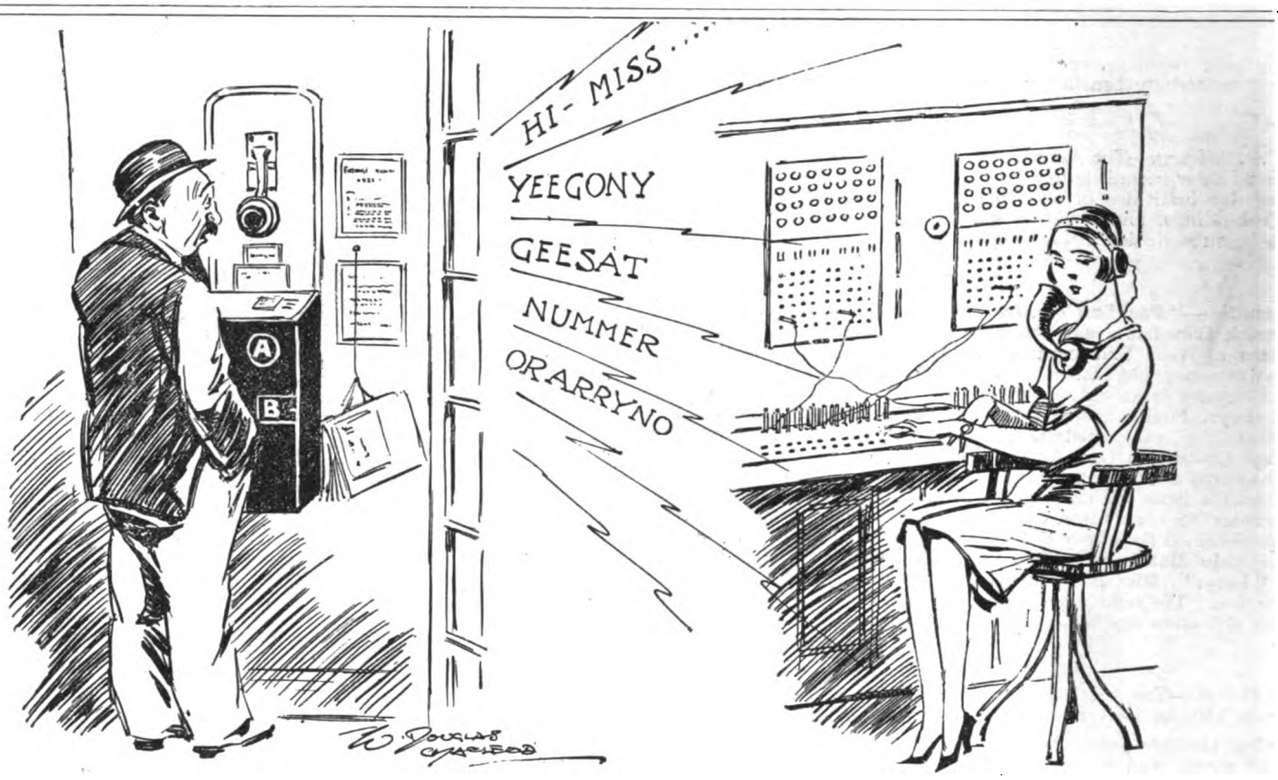

(A Glasgow contemporary's idea of the problems of the Anglo-Continental Telephone services.)

EXCHANGE GIRL—"Sorry; the lady who knows Norwegian is out for her lunch."

[Reproduced by courtesy of the "Glasgow Evening News."

GLASGOW TELEPHONE NOTES.

ON the evening of Mar. 27, 1930, members of the Traffic Branch and of the Exchange Supervising staff met in Reid's Café, Gordon Street, to bid goodbye to the subject of our portrait, Mr. J. A. Matheson, Traffic Supt., Class II, in consequence of his transfer to the Edinburgh Traffic Office. Representatives from the other sections of the District Manager's Office and from Scotland West Traffic Branch were also present.

MR. J. A. MATHESON.

The gathering was arranged to provide an opportunity of making tangible recognition to Mr. Matheson of the high regard in which he was held by the various members of the staff with whom he came in contact, and half-way through a programme of songs and readings Mr. Johnson, Traffic Supt., conveyed to Mr. Matheson, on behalf of the staff, a portable H.M.V. gramophone. In making the presentation Mr. Johnson referred in happy phrase to the success with which Mr. Matheson had maintained the high traditions of the Glasgow Traffic Branch and to his deservedly earned popularity with all those whom he met in the course of his official duties. He extended to him the best wishes of all his friends for his future success in the service.

Mr. Johnson was followed by Mr. Coombs, District Manager, who occupied the chair. In a racy speech Mr. Coombs referred at length to the highly successful manner in which Mr. Matheson had discharged the duties of Traffic Supt. in charge of the "Service" Section of the Traffic Branch and wished him Godspeed in his further progress in the Department. Miss Wood and Mr. Harvey on behalf of the Exchange Supervisors and Clerical Staff, respectively endorsed with a few remarks the appreciative references to Mr. Matheson of the previous speakers. Mr. Matheson at the finish of a well-delivered reply was accorded enthusiastic musical honours.

After an interval for tea and conversation the second half of the musical programme was carried to a conclusion. A very enjoyable evening terminated with the singing of Auld Lang Syne.

The promotion prospects of the Glasgow Clerical Staff, which were stagnant for many years, have been given a fillip. After Mr. Dewar comes Mr. Gibson, who was the central figure in an interesting ceremony on Friday, Mar. 28, on the occasion of his leaving the Glasgow Office to take up an appointment as "Clerical Officer with Allowance" in the Scotland West District.

Mr. Gibson joined the service of the late National Telephone Company in 1902 as a Junior Clerk. He was promoted Clerk (Overseer scale) (later Third-Class Clerk) in the Post Office in 1914, and until the changes necessitated by the Reorganisation Report was in charge of the Advice Note Section.

Mr. Wright, Chairman of the Civil Service Clerical Association (Glasgow Branch), congratulated Mr. Gibson on his appointment, commented on his popularity and assured him of a warm welcome at any of the social functions which might be held under the auspices of his office. Mr. Law, Chief Clerk, Mr. Johnson, Traffic Supt., and Mr. Lucas, Contract Manager, also voiced congratulations and good wishes. Mr. Coombs, District Manager, on behalf of the staff, presented Mr. Gibson with a suit case, golf bag and clubs. He spoke highly of Mr. Gibson's abilities as an officer of the Department and of his sterling worth as a man and wished him every success in his new surroundings.

Mr. Gibson thanked Mr. Coombs and the staff for the many kind things which had been said and for the appropriate and useful gifts.

The Bell Golf Club carried out the first meeting of the season over the Deaconsbank Course on Wednesday, Mar. 26, when the afternoon's sport was thoroughly enjoyed under ideal weather conditions. The winners were, first, J. Cameron (80 net), followed by a tie for second place between J. A. Matheson & G. Hunter, with a net score of 82 each. Although all of the above are members of the Traffic Branch, it is not suggested that there is any connexion between the reckoning of "special records" and golf scores.

Voice over Central Enquiry Line: "Could you tell me, Miss, where in Glasgow I could buy a monkey"?

Central Enquiry Telephonist (with local knowledge): "Yes; at ——'s."

Voice: "Thanks very much, Miss. I have won my bet. I told a friend here that the Glasgow Enquiry could tell me anything I wished to know and he bet me that you couldn't tell me where I could buy a monkey. Thank you."

It has been officially denied that the owner of the voice went 50-50 with his winnings with the Central Telephonist.

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"My Service."

(*Concluded.*)

I NOW come to the most important part of my talk. I should like to tell you how big a part telephone service plays in my work. It links me with my stockrooms, with my supplies and with my special customers. Often enough it means just the difference between getting something through successfully and failure. To a very busy person good telephone service is of high importance, but to me it means even more than that. Naturally, it is imperative to keep one's hands on a thousand things and keep them woven together harmoniously. It is impossible to be in these thousand places at once, and for this reason the telephone is worth its weight in gold to my business and therefore to me, if it gives me that efficient service I have learnt to look for in it.

I wonder if telephone operators know how close they are to the heart of things—how much difference it makes if they put themselves wholly into their job. How many of the fine points of life—business and personal—are settled across a telephone. I think telephonists must feel rather like the Fates—who, unseen, sit weaving the threads of people's destinies.

You have more scope for making people feel the true value of real courtesy and service than almost any other people I can think of. Because you, too, come across grouchy people, just as we do, you may think your interest and efficiency not appreciated, but this is not so—there are always the other 80% who will recognise and be grateful, and, even with the grumpy ones you never know what help you are giving to the other people they are in contact with by the swift execution of their requests.

Speaking of appreciation: I will tell you of a recent incident which will serve as an example, since the people concerned are known to me personally.

A business man, whose headquarters are in Paris, but who has important interests in this country, comes over to London frequently and stays at one of our big hotels. A few weeks ago, arriving by the Golden Arrow, he found when he reached his room, that he had to telephone someone named Gray living in one of the streets of Knightsbridge. Turning to the telephone book, very tired, and in a hurry to change for a dinner engagement, his horrified eyes saw page after page of Grays—and he didn't even know the initial of the particular Gray he wanted. He called up the hotel operator and said: "If you haven't done your good deed to-day, here's your opportunity. I want someone named Gray, living in X Street, off Knightsbridge. Please get him for me." In three minutes his telephone bell tinkled: "Mr. Gray is out. He is expected in within ten minutes. I'll try again then, and let you know." Within a quarter of an hour his telephone rang again. "Mr. Gray is on the line waiting to speak to you."

The next morning our business man was rung up at the hotel. The same operator took the call. "I'm sorry, there is no reply," she answered, "but I remember he told me yesterday he didn't always hear the bell, so I have sent a page up to his suite to see if he is in. Will you hold on?" Two or three minutes later, she reported that he was in and coming to the telephone.

Later he was discussing this with his secretary, who said: "What a pity we haven't someone as courteous and thorough at our telephone at the office, especially since our business calls so much for very careful telephone service." He smiled and said nothing. A week later that operator was installed in a job in his London office at a greatly enhanced salary, and, since it is a young progressive business, she has a wide scope for advancement.

That is just an incident, but it serves to prove that thinking round your job instead of just carrying out its essential duties is not only worth while, but, almost invariably, "bread upon the waters" leading to some pleasing form of recognition.

Salesmanship, you know, isn't just the prerogative of people who handle merchandise—it is just as applicable to a telephone operator as it is to a stockbroker, a saleswoman in a store, or a great dressmaker.

Efficiency, perseverence, intelligence, judgment, enthusiasm, concentration and consideration—all the components of officially recognised salesmanship—are the qualities which belong just as much to your job. You may not see the returns—the figures built up on the strength of your demonstraticn of these points, but they are there just the same, and they mean more than you can ever trace, contributing towards the smooth running of things a far greater share than can be expressed in words.

Lastly, I should like to say something about charm. Like original sin, there is a bit of it in everybody's composition—and for some reason (obscure, but probably as old as time) the greater monopoly of this attribute has been accorded to women. Charm is too elusive a thing to go after, it grows out of the warmth of other qualities, as peaches ripen against a sun-baked wall rather than through the direct contact of the sun. You are given a few grains of it to start with, and it depends on you, as the individual, whether you make anything of this material or not. The best way to foster it is with that acquisition of understanding and consideration—and all those other qualities we have been talking about—which are so imperative to salesmanship whether it be your job or mine.

Charm is a queer fellow—like Will o' the Wisp, he doesn't belong to Beauty, Breeding, Education, Brilliance or Position—he just is or is not—he will be found where there are those several qualities which are the fine essence and real meaning of service, and he is the best birthday present anyone, socially or in business, could wish for.

Here is something for you to remember:

A clever American woman writer was asked by a famous editor to define Charm. She shook her head—smiled, and wrote:—

"Not Beauty, nor Intelligence, nor Grace,
Nor any pondered lore,
Nor manner, nor the mark of ancient race,
But just—the something more."

which brings us back to the beginning—

"The good heart does a little extra."

N. ELTT.

Pollards Exchange.

A first birthday celebration, in the form of a Social and Dance organised by the staff of the new Pollards Exchange, Norbury, took place on Saturday, Mar. 8, at the Library Lecture Hall, Thornton Heath, when a very pleasant evening was enjoyed by a large gathering of friends present.

As a striking contrast to the Arctic elements which preceded the opening of the exchange just a year ago, when "something hot" was the order of the day, such a moderate temperature prevailed during the refreshment interval that "Lemonade" proved the favourite and an "easy winner." Miss E. M. Brown took charge of the catering arrangements in her usual capable manner, and there were many willing helpers to assist.

The Black Dominoes Dance Band and the "spot-light" were features of the evening much appreciated, and Miss D. S. Stribley's recitation "I aint 'arf a lucky kid" was loudly applauded.

It is hoped that there will be many happy returns, for as yet we are amongst the babies of the London Telephone Service. And those who sometimes ask in such surprised tones, "*What* Exchange are you? Never heard of such a place! Where the dickens *are* you?"—will perhaps come along, see, and incidentally enjoy themselves.

A. G. T.

Holborn Exchange.

The social events of the winter season have now been completed and the staff at Holborn can congratulate themselves upon the success of their efforts. Under the presidency of Miss Redmond the members of the Children's Tea Committee have done well; the Social held in the Dining Room on Jan. 24, 1930, proved a very jolly affair, and a profit of nearly £6 was added to the Fund. Many thanks to Miss Fensham and Mr. F. Field, who entertained with elocution and solos respectively. The pantomime "Cinderella"—written, produced and performed by the staff at Holborn—formed the amusement at three children's teas, gave pleasure to disabled soldiers, and saw a successful public performance.

On Feb. 1, 1930, the company journeyed to St. John's Hall, Hendon, to the Children's Tea given by the staff of the Speedwell Exchange. Miss Fensham—who was a Holborn telephonist before her promotion—was the organiser, and under her excellent management the producer of "Cinderella" had every opportunity of making the show a success.

Two hundred and fifty children were entertained by the Holborn staff at the Central Mission, King's Cross, on Feb. 15, 1930; there were toys, sweets and a good tea awaiting them when the eventful day arrived, and "Cinderella" was performed with spirit and determination in spite of many difficulties with which the caste had to contend.

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Miss Duggin, of Tottenham Exchange, assisted by friends from "Trunks," gave a Tea to 250 children at St. John's Hall, Stamford Hill, on Feb. 22, 1930, when "Cinderella" saw its third appearance. How delighted the children were with the coach and all the fairy lights!

The public performance at St. Bride's Institute on Mar. 6, 1930, exceeded expectations, and the pantomime was produced under the best possible conditions and was very successful. Other artistes gave valuable assistance, Miss R. Young, in her humorous songs delighted the audience, and "Holborn" hopes to see more of her at future concerts. Miss D. Curnow and D. Wilson both showed themselves to be possessed of fine voices and it is anticipated that they will be heard and seen in next year's productions. Miss C. Hunt's contralto voice is too well known to need advertisement, and Mr. Boncey rendered an excellent solo in spite of a severe cold. The professional singers —Miss R. Sheppard and Mr. Guiseppe Ceci—in their songs and duets, drew continued applause from the large audience. Many thanks for their valuable services!

"Suppressed Desires" showed to advantage the dramatic talent of the Misses P. Stanley and L. Connelly, and Mr. A. Tubbs. The sketch was admirably suited to the performers and was appreciated by all present.

On Mar. 29, 1930, a tea was given to the disabled soldiers at Lonsdale House, Clapham, by the girls at Holborn; the Misses Clarke and Bowker should be proud of the splendid work they are doing in this connexion. Upon their invitation the pantomime was presented and the soldiers thanked the performers for the simple tale simply told. All the caste of "Cinderella" worked so well in all performances that it is difficult to make distinctions, but Miss C. Huley undoubtedly possesses dramatic ability and would do well to develop her talent in that direction; her portrayal of "Cinderella" was favourably commented upon at all performances.

Miss M. Logan and Miss E. Jones arranged the dances and their solo dancing was wonderful! Holborn is fortunate in having girls talented in this art. Many thanks to Mr. Newton, who made the coach and took charge of all the stage arrangements.

Now girls! who will volunteer for the position of dramatic critic for next season?

G. M. T.

Contributions to this column should be addressed: The Editress, "Talk of Many Things," *Telegraph and Telephone Journal*, Secretary's Office, G.P.O. (North), London, E.C.1.

LONDON TELEPHONE SERVICE NOTES.

Contract Branch Notes.

THE business done by the Contract Branch during the month of March resulted in a net gain of 1,992 stations, as compared with 3,190 stations in the corresponding month last year.

The gross new business exceeded that for last year, but ceasements were again high and the result is reflected in the reduced net gain. No less than 800 stations were lost during this month in one contract district alone through 9 subscribers either ceasing or reducing their installations. In the case of a large West End Hotel, 537 stations were lost under circumstances which rendered it impossible to retain the installation or, for the time being at any rate, of recording a corresponding gain.

Exhibitions.—The Ideal Homes Exhibition at Olympia attracted many more exhibitors this year than last year, and the number of telephones provided was 218, which is a considerable improvement on last year's figures.

At the Exhibition held in March last year a visitor was handed an agreement by a Contract Officer which was returned duly signed on Mar. 20, 1930—a year later.

The "seeds" of propaganda may not always bloom in the first year, but they do not necessarily die.

Promotions.—We are pleased to record the promotions to H.C.O. of Mr. G. O. Esdaile and Mr. R. L. N. Canham.

Mr. Esdaile was employed in the Contract Branch Headquarters, and Mr. Canham was in the City District Office.

"*April Fool.*"—April 1 is the day of the year when the self-styled practical joker claims to be given full licence, regardless of the consequences of his actions.

The day produced the usual crop of applications for Telephone Service which on investigation proved to be inspired by that type of individual whose perverted sense of humour causes much trouble and expense to other people, by their feeble efforts to be "funny."

One Contract Officer had four such hoaxes to deal with and a very indignant letter was received from an irate householder to whom an agreement had been sent at the supposed request of one of his "friends" complaining of interference by the Department with his private affairs.

We do not always see the funny side of the other fellow's "joke" but the absence of originality in this kind of April perennial induces us to retort on the perpetrator, by addressing him in his own words "April fool," or to use a colloquialism "And you."

Obituary.—The South-East Contract Office suffered a severe loss in the death of Mr. P. Kelly, who died very suddenly on Mar. 20 last after an operation.

"Pat" as he was affectionately known to most of his colleagues, entered the service of the National Telephone Company on Feb. 4, 1910, and had an extensive knowledge of the details of Contract work which was invaluable to the office. He will long be remembered, especially by the junior officers, as one who was always ready to give counsel and advice, and to give it cheerfully and ungrudgingly.

The funeral at Brockley Cemetery was attended by the District Contract Manager and a number of the staff, and the quantity of flowers sent testified to the general affection in which he was held.

L.T.S. Sports Association.

Football Section.—The season ended, so far as League engagements are concerned, with an away win on April 5 over the Royal Mint by 2 goals to 1. This completes the programme for the season which reads as follows:—

				Goals.		
Played.	*Won.*	*Lost.*	*Drawn.*	*For.*	*Against.*	*Points.*
20	16	0	4	85	19	36

A splendid record. The Football Section have brought further honours to the London Telephone Service by annexing the 2nd Division Civil Service League Championship.

It will be remembered that the Bowls Section last summer won Bunbury Cup competed for by all Civil Service London Clubs.

The winning of the Championship by the Football team means that the club will automatically ascend to the 1st Division next season, when no doubt the opposition will be much stronger, but it is felt that the present team will acquit itself creditably in the higher circle. No doubt the Captain Futerman, and Messrs. Evans and Culley will feel very pleased with the results of a very successful season.

Bowls Section.—The representations made to the Civil Service Sports Council requesting that a panel be provided and exhibited showing the winners of the Bunbury Cup have been refused on the grounds that it is the custom to limit such displays to competitions involving National Civil Service championships.

A variation in the method of collecting green fees is proposed this year. Tickets will be issued as usual for players engaged in single-rink contests, but in the case of club matches the team Secretary will be responsible for collecting and paying over the full amount due in respect of each member of his club, and in return a combined receipt will be issued instead of the former practice of purchasing blocks of tickets.

Accounts Branch Cricket Section.—The Annual General Meeting was held at Cornwall House on Monday, April 7.

The new President, Mr. R. Tinniswood, occupied the chair, supported by Mr. W. R. Bold, the Vice-President.

The minutes of the last General Meeting were read and confirmed.

A brief outline of the past year's activities was given by Mr. Hough, the Secretary, followed by a financial statement showing a balance in hand of £3 14*s.* 5*d.*

Mr. Hugh Williams (the Club Chairman) appealed to the honorary members to support the club as much as possible during the forthcoming season by attending the matches and assisting, by umpiring, scoring, &c. A satisfactory response is anticipated.

A vote of thanks was accorded to Mr. Tinniswood not only for presiding over the meeting but also for the keen interest he had already shown in the club.

He replied that it was his intention to attend some of the matches and that the club could rely upon him as an enthusiastic supporter.

Contract Branch Cricket Section.—It has not yet been possible to sum up the prospects of the Contract Department's chances of regaining the Cricket Shield which was lost last season to the Traffic Branch.

Here is a list of the season's arrangements:—

May 6 (practice)	at Battersea Park.	
May 13	„ „ Finsbury Park.	
May 20.—	League Match *v.* Accounts	At Chiswick.
June 10.—	„ „ *v.* „	
July 3.—	„ „ *v.* Messengers	
„ 8.—	„ „ *v.* „	
„ 22.—	„ „ *v.* Traffic	
„ 29.—	„ „ *v.* „	

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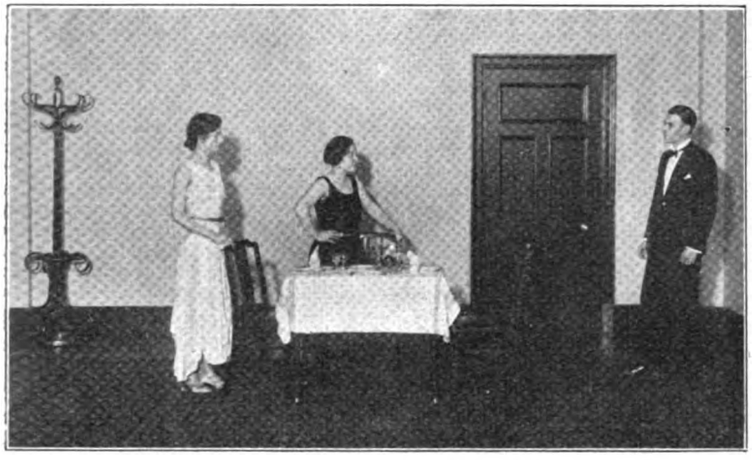
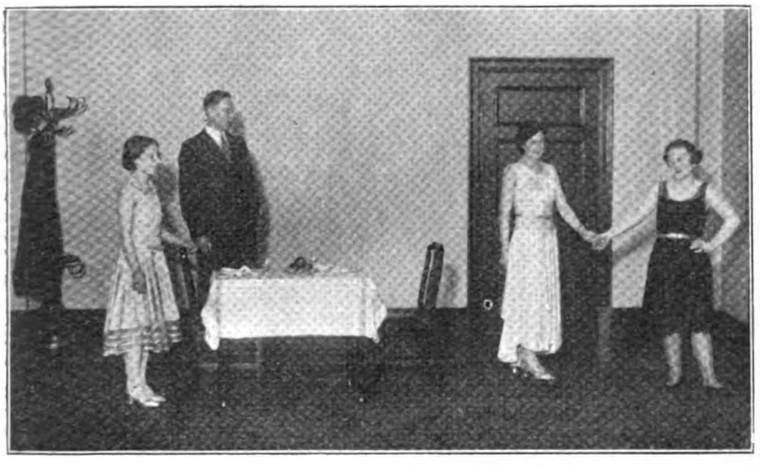
Stamford Dramatic Society.

On Mar. 24, at the Cripplegate Institute, the Stamford Dramatic Society produced "The Best People," a light comedy, before an enthusiastic audience. This is the fourth play given by the Society during the two years of its existence, and we congratulate the members on the high standard



STAMFORD DRAMATIC SOCIETY IN "THE BEST PEOPLE."

of acting which they have attained in this short period. Although the play itself is of a type which could hardly fail to entertain, it requires skilful direction and polished acting to ensure its complete success, and we consider that the sincerity of the Society's interpretation is indicative of the extent to which their ability has grown with experience.



ANOTHER SCENE FROM "THE BEST PEOPLE."

Generally, the play appeared to have been carefully rehearsed and the players thoughtfully cast, and we were particularly pleased with the absence of those irritating hitches and unhappy pauses which frequently mar amateur productions. Special mention must be made of the orchestra which provided well-chosen light music during the intervals.

May we say that we consider this play to be quite the Society's best to date, and we look to them to maintain in future productions the tradition they have created with "The Best People."

National Sanatorium—Benenden.

The last Concert of the Season organised by the Staff of the London Telephone Service was held on Saturday, Mar. 1.

The Artistes were:—Miss Nellie Beare, soprano, Miss Margaret Worth, mezzo-soprano, Mr. Hugh Williams, tenor, Mr. Arthur Hider, bass, Mr. Arthur Samuels, humourist, Mr. Wilfred Stracey, entertainer, and Miss Ida Wise, accompanist.

The Concert was under the direction of Miss Worth.

The programme comprised Songs, Duetts, and Quartettes. The Staff patients were delighted with the items and the humourist received no meagre portion of the applause.

The Resident Medical Officer, on behalf of the audience, proposed a very cordial vote of thanks to the artistes for their entertainment and to the staff of the L.T.S. in providing the means by which the Concerts were possible.

Miss Worth responded and stated that it was always a pleasure to organise the Concerts and that the artistes were most willing to assist her whenever possible.

Retirement of Messrs. F. Sinclair and R. Macann.

To mark the occasion of the retirement of Mr. F. Sinclair, Night Supervisor, London Wall Exchange, and Mr. R. Macann, Night Telephonist, Sydenham Exchange, after serving 39 and 22 years respectively with the Telephone Service, a tea and social was held at the Royal Hotel, Southampton Row, on Mar. 10. There were at least 150 persons present, including Night Supervisors and Night Telephonists, a good many with their wives and children.

F. SINCLAIR.

R. MACANN.

A very enjoyable time was spent; after tea there was some good singing, rendered by the ladies present and the Night Staff.

Mr. Napier, Controller, expressed his pleasure at being asked to attend to make the presentation. He handed to Mr. Sinclair a cheque for a substantial amount and to Mr. Macann a smoker's cabinet and a cheque with the best wishes of their colleagues. Both the recipients expressed their pleasure and thanks for the gifts and message of goodwill.

As the function was drawing to a close the whole joined in the chorus "For he's a jolly Good Fellow" and concluded with "Auld Lang Syne."

Presentation to Mr. B. R. Mead, Traffic Branch.

A representative gathering of London Headquarter and District Traffic Officers assembled in the Conference Room, Cornwall House, on April 4, to greet and congratulate Mr. Mead on his recent appointment as District Manager, Canterbury. The Controller, Mr. Napier, on behalf of Mr. Mead's many friends in the L.T.S., presented him with a cut glass Reading Lamp and a Barometer. Mr. Napier, in referring to Mr. Mead's appointment as a well-deserved promotion for his many years' hard work and varied experience in the Service, jocularly evolved the theory that a District Manager's tour of offices round the Thanet coast resorts may have influenced Mr. Mead in his selection of a barometer as one of the gifts. Mr. Mead in responding gave a glowing description of the beautiful surroundings of his new office and stated that while he was greatly attracted by his new appointment he felt it a great wrench after so many years to leave his many friends in the L.T.S.

Presentation to Mr. J. Leslie, Accounts Branch.

On Mar. 7, after 47 years' 7 months' and 7 days' service, Mr. Leslie retired. The Conference Room was crowded, just after office hours, on that day, to bid him farewell. The Controller, in presenting Mr. Leslie with a cabinet gramophone and records, referred to his long and faithful service.

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He commenced in the Northern District Telephone Company on July 31, 1882, and after occupying various posts in the Provinces, was appointed Chief Clerk of the City District, London, in 1896. In January, 1905, Mr. Leslie was appointed Chief Cashier, Metropolitan District, and he held this position through to the transfer of the N.T.C. in 1912 until 1922, when the Revision of Rates called for his skilled accountancy in another section of the Accounts Branch. Mr. Napier made appropriate reference to the high esteem in which Mr. Leslie was held by all his colleagues, his strict integrity and lovable disposition.

Mr. Leslie's reply was typical of his modesty but not lacking in appreciation of the parting gift and the heartfelt good wishes that accompanied it. The following extract from a letter subsequently received describes his feelings. "Friday, Mar. 7, was a strange sort of day for me. I would not go through it again not even for another gramophone." So ends the official career of one of the stalwarts of the Telephone Service. He will be greatly missed by the Staff. Men of his calibre who are so considerate and take such kindly interest in their fellow workers can ill be spared.

Personalia.

Resignations on Account of Marriage.

Telephonists.

Miss M. Lycett, of Museum.	Miss M. L. Doe, of Ealing.
„ K. A. M. Huxham, of Museum.	„ I. G. Bower, of Tottenham.
„ W. E. Little, of Ilford.	„ K. Perrin, of Tandem.
„ M. Williams, of Clissold.	„ W. M. T. Smith, of Tandem.
„ G. O. Ruffey, of Hop.	„ A. L. Eames, of Paddington.
„ G. E. Goodhew, of East.	„ G. A. Doughty, of Bermondsey.
„ R. E. Pollard, of East.	„ E. M. Wesley, of Avenue.
„ L. E. I. Rushworth, of Toll A.	„ R. V. Seeley, of Trunks.
„ J. A. F. Ruffles, of Gerrard.	„ E. M. Howlett, of Trunks.
„ F. Cole, of Fulham.	„ M. L. E. Jones, of Bishopsgate.
„ V. M. Robbins, of Holborn.	

A DOGGY STORY.

IF I were asked what I like most about my job—I am a Contract Officer—I would not hesitate in answering "Adventure." Now that may seem strange to the uninitiated. What adventure, they will ask, does a Contract Officer meet with? Yet it is a fact that seldom a day passes without something exciting happening to relieve the sameness of endeavour—which sounds better than "the monotony of work."

For instance, this morning I called by appointment upon a charming lady, petted her dog a little, and obtained an order. In case it may be thought that I obtained an order *by* petting her dog, let me add that this action was quite incidental.

As I left the house the dog left, too. A few turnings away I noticed that he was following me, so I tried to "shoo" him home. Not being successful in this, I continued on my way and made another call. This call finished I left the house, and received a rapturous welcome from the dog, which had waited patiently for me.

This was getting awkward. Now what should I do—take him back home, or continue on my journey in the hope that he would come to see the folly of his ways? I decided to try strategy.

First, I let the animal bound a long way ahead, then hid behind a tree. Nothing doing—he rushed back and came straight at me with joyous barks.

I then tried going a little way up a short turning, doubling back when he was a long way ahead, then darting up another road. Same result—dog's arrival, breathless, but evidently enjoying it immensely.

And so we kept on for another couple of miles, until I knew that it was a case of either taking him all the way home or having his company for the day. I chose the former alternative as being the less unpleasant.

When the dog's mistress came to the door she said "Oh! you naughty darling." I forget now what I said.

Some things are better forgotten. F. W. G.

LONDON ENGINEERING DISTRICT NOTES.

Presentation to Mr. Harry Stone.—A large gathering of members of the London Engineering District assembled at Denman Street to bid farewell to Mr. Stone on his retirement from the service under the age limit.

Mr. Gomersall, Superintending Engineer, in presenting a cheque to Mr. Stone, outlined the qualities that he considered should be possessed by an officer filling the responsible post of Executive Engineer. He must, said Mr. Gomersall, be a man whom you can trust, in counsel wise, in judgment good; he must speak what he thinks but speak wisely and he must be at once just to the Department and sympathetic to the staff. He regarded Mr. Stone as a model Sectional Engineer. He possessed powers of organisation to an unusual degree and his wide experience enabled him to deal adequately with the emergencies which from time to time challenge the resources, abilities and zeal of engineers. Moreover, Mr. Stone had succeeded to a continually increasing degree in combining efficiency with economy—an objective forced by the times upon all executive and administrative officers.

Capt. Hines, Mr. Brown, Mr. Ridd all paid tribute to Mr. Stone's outstanding qualities as a man and engineer. Their observations were endorsed by Messrs. Hilton on behalf of the Clerical Staff, Gallard on behalf of the Chief Inspectors, Simmons on behalf of the Inspectors, and by Mr. Dennis.

Mr. Cornwall recalled several amusing incidents which had occurred during his long acquaintance with Mr. Stone, and wished him the best of good fortunes. Mr. Bolton said in his early years he had received great encouragement from Mr. Stone, which he was glad on such an occasion to recognise. Messrs. Padden and Prescott, on behalf of Mr. Stone's immediate assistants, voiced their appreciation of one who, in the words of Mr. Prescott, was a very fine gentleman.

Mr. Stone, in reply, thanked the various speakers for their very generous tributes. He recalled many interesting episodes of his long career, referred to the interests which would prevent his "stagnation," and finally gave a cordial invitation to those of his friends who might find themselves in the vicinity of his "home in the country" to look in and chat over days gone by.

Final of Civil Service Football Cup: L.E.D. Lose to Ministry of Pensions.—A serious knee injury to H. L. Webdale early in the game largely contributed to the defeat of the L.E.D. when the met the Pensions in the final of the Civil Service Cup at Chiswick on April 9. For the first 20 minutes of the game the L.E.D. more than held their own and gave every promise of at last winning the coveted trophy; but this was not to be. Webdale's retirement necessitated a re-shuffling of the team and whilst in this disorganised state Daniel opened the scoring for the Pensions. At half-time the score stood at 1-0, and although in the second half the "ten men" battled gallantly against superior odds, they were unable to pierce their opponents' defences. Once "Jim" Casey got clean through, but his usual unstoppable shot went wide of the goal. Midway through the second half Daniel increased the Pensions' lead with a shot which went in off the foot of the post, and just before the end Gower converted a penalty, for the Pensions to run out winners of a dour fight by 3-0.

As a whole, the L.E.D. defence stood the test well, but playing only four forwards, the attack fizzled out, although G. H. Smith (Redhill F.C.) gave his usual polished display at inside right. Of the Pensions team, H. H. Gower (Dulwich Hamlet International) and W. Barr (London Caleys) played outstanding games, whilst Daniel (Bromley) made an efficient centre-forward.

The heads of both the Departments concerned attended the match, which attracted a record gate. Mr. F. O. Roberts, Minister of Pensions, had the satisfaction of seeing his men win the final for the second time, whilst the Superintending Engineer, Mr. E. Gomersall, who was accompanied by Sir Raymond Woods, was most unlucky to see his side defeated in the final; for a similar experience befell him when he came to London with the Sheffield Engineers in their final tie with the Pensions 3 years ago.

Sir Fredk. J. Wall, of the Football Association, presented the Cup and badges to the winners, after which a large company of players, officials and guests, spent a delightful evening of song and dance in the Pavilion.

Teams.—L.E.D.—T. Donegan, F. S. Lever, H. L. Webdale, S. A. Skinner, W. J. Toleman, W. Merrick, J. E. Shelley, G. H. Smith, W. A. Drew, S. V. Brocklesby, J. Casey. *Ministry of Pensions.*—A. M. Wilkinson, K. S. Weston, H. H. Gower, C. C. Boorman, W. Barr, J. Hill, S. H. Murrell, R. E. Higgins, S. V. Daniel, F. Watts., G. P. Illingworth.

Opening of New Exchanges.

Name.	*Manufacturer.*	*Type.*	*Date.*
Amhurst (Paragon Road, Hackney)	A.T.M.	Automatic	April 3, 1930.
Fairfield (Croydon)	G.E.C.	Automatic	April 30, 1930.

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THE

Telegraph and Telephone Journal.

VOL. XVI. JUNE, 1930. No. 183.

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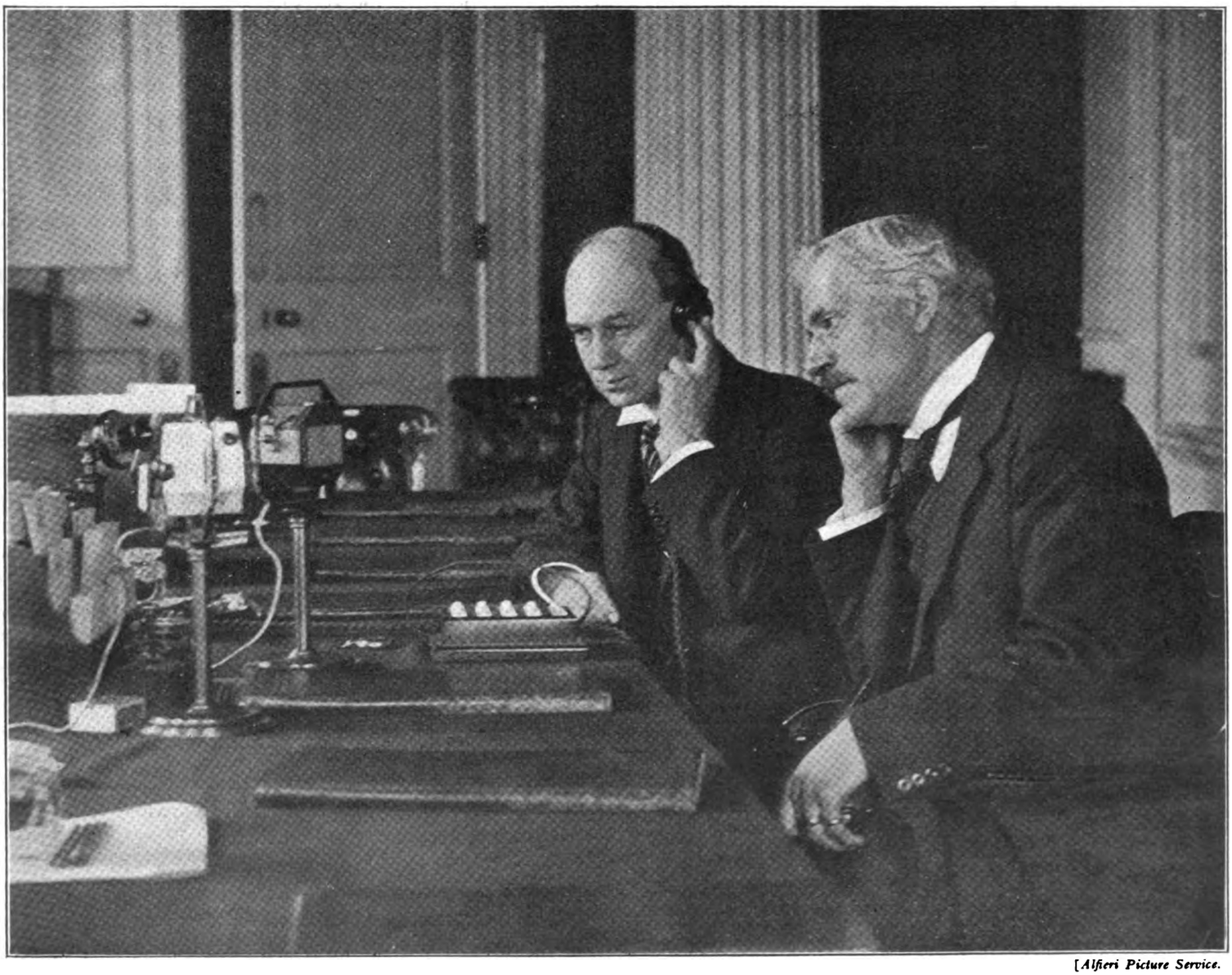

[*Alfieri Picture Service.*

THE RIGHT HON. J. RAMSAY MACDONALD INAUGURATING THE ANGLO-AUSTRALIAN TELEPHONE SERVICE. BESIDE HIM IS THE POSTMASTER-GENERAL. (*See page* 177.)

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The
Telegraph and Telephone Journal.

PUBLISHED MONTHLY IN THE INTERESTS OF THE TELEGRAPH AND TELEPHONE SERVICE, UNDER THE PATRONAGE OF THE POSTMASTER-GENERAL.

Editing and Organising Committee - - - Lieut.-Col. A. A. JAYNE. J. STUART JONES. W. D. SHARP. W. H. U. NAPIER. J. W. WISSENDEN.

Managing Editor - - W. H. GUNSTON.

NOTICES.

As the object of the JOURNAL is the interchange of information on all subjects affecting the Telegraph and Telephone Service, the Managing Editor will be glad to consider contributions, and all communications together with photographs, diagrams, or other illustrations, should be addressed to him at the G.P.O. North, London, E.C.1. The Managing Editor will not be responsible for any manuscripts which he finds himself unable to use, but he will take the utmost care to return such manuscripts as promptly as possible. Photographs illustrating accepted articles will be returned if desired.

VOL. XVI. JUNE, 1930. No. 183.

OVERSEAS TELEPHONE EXTENSIONS.

AFTER a period of relative quiescence,—we say relative advisedly, for minor extensions of the overseas telephone services, amplifications of existing relations take place every month—a great burst of activity in the task of bringing other Continents into telephonic communication with this country has taken place during the last four or five weeks. In the first place service was opened to Australia enabling subscribers in their homes and offices to speak to subscribers in their homes and offices in Sydney, Melbourne, and Brisbane. This constitutes the longest-distance service of any kind hitherto afforded to the telephone-using public. Secondly, a subscriber-to-subscriber radio service was opened to the Argentine and extended by land lines to Uruguay and Chile. Thirdly, a service was opened via Paris to a call office in Rio de Janeiro, Brazil; and fourthly, communication has been established between this country via Amsterdam and certain call offices in Java in the Netherlands Indies.

Another important step which was taken last month was the reduction of the charges between this country and North America by £1 a minute, so that the charge for a call of minimum duration from London to New York or Toronto is now £6. As the charge for a 3-minute call to Australia is also £6, that for calls to Buenos Aires and Rio £6 9*s.* 0*d.*, and to Java £5 2*s.* 0*d.*, it will be seen that for about £6 communication is now obtainable with the eastern side of North and South America, the East Indies and Australia—surely a moderate sum for a facility of such incalculable benefit.

On a former occasion we remarked that the four Continents of the older geographies were in telephonic communication with this country, with the exception of Asia. We can now extend the statement to the six Continents of the modern geographer without reservation.

RURAL INQUISITIVENESS AND RURAL RESERVE.

WHILST in this country there is an occasional clamour in the correspondence columns of newspapers by writers with an imperfect grasp of telephone finance for utterly uneconomic reductions in rates, there is, amongst the managers and administrators of the thousand and one rural American telephone companies constant evidence of recurring efforts to persuade their subscribers to pay higher rates and thus enable the companies to give them a more up-to-date service with improved and modern plant. The public in Great Britain have little idea of the conditions (to which we made some reference in our March issue) of rural telephony in some parts of America. They know, of course, that the rates are very low, and they are apt to assume that the service afforded is of the high grade associated with the names of the large American companies. We imagine, therefore, that the remarks of Mr. H. A. White, of the American Electric Company, at an annual convention of the Iowa Association, will strike our readers as naive in the extreme. "It can be said without contradiction, I believe," said Mr. White, "that magneto service is fast becoming out-of-date for town and city service." He adds that it is suitable for multi-party line farm services, but admits that many rural subscribers consider it out of date, and goes on to urge rural companies to lay out a programme working towards a higher type of service at reduced rates. "Lead your subscribers," he says, very properly, "to a better rate and do not let them drive you to improvements that should be made, making it much harder to get proper returns." Metallic service of the common battery type, he recognises, is the present-day type of service demanded. But if further evidence were required of the radical differences between British and American rural service, we think it would be supplied by the following sentences. "The average rural subscriber does not want, and in fact won't have, what has been tried several times—a lock-out system. *He wants to listen in on the line, and will do it.* A common battery telephone can be arranged so he can listen without robbing the line of battery and not signal the operator, except when he wishes to place a call."

Could the difference in the psychology of two countries be more acutely emphasised? In Great Britain the main objection to party lines is that other people can listen to your conversation; in rural America the chief charm of the system is that it enables you to overhear your neighbour's business. There the telephone is not only a means of communication; it is also a kind of mechanical feuilleton, novelette, local gazette and cross-talk comedian. It helps to while away the long evenings on lone farms. It also explains the seeming paradox that telephone development is higher in the "great open spaces" where habitations are scattered and remote than in the more compact (or less inquisitive) rusticity of England.

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HIC ET UBIQUE.

ON April 30 public telephone service was opened between this country and Australia. Communication is available to and from all parts of England, Scotland, and Wales, and was restricted initially in Australia to calls to and from telephone subscribers (at their ordinary telephones) in Melbourne and Sydney. For the present the hours of service (British time) are 7 a.m. to 10.30 a.m. and 4.30 p.m. to 10 p.m. Monday to Friday, and 7 a.m. to 10.30 a.m. Saturday. The service will not be open on Sunday for the time being.

The charge for a call from any place in Great Britain to Melbourne or Sydney is £2 per minute, minimum £6 for 3 minutes.

May was a month of considerable activity in the overseas telephone services. Not only was the Australian service extended to Brisbane and other places in Queensland (at the rates above quoted), but important extensions and additions were made to the service to South America.

A full person-to-person service was opened between subscribers in all parts of England, Scotland, and Wales, and subscribers (at their ordinary telephones) in the principal towns in the provinces of Buenos Aires, Cordoba, and Santa Fe (Argentine), Monte Video (Uruguay), and Santiago, Valparaiso, and Vinadelmar (Chile). The charge for a 3-minutes' call to the city and province of Buenos Aires is £6 9*s*. 0*d*. ; to the remainder of the Argentine and Uruguay £6 15*s*. 0*d*., and to Chile £7 1*s*. 0*d*.

The new service will be afforded for the present via the Madrid-Buenos Aires radio circuit, calls to Chile and Uruguay being extended over land-lines from Buenos Aires. Connexion will be made over a *direct* radio link between the Post Office radio stations in this country and the radio stations in Buenos Aires as soon as the necessary arrangements can be made.

On May 14 a limited telephone service was opened between London and Rio de Janeiro (via Paris). At the outset the hours of service are restricted to 5 p.m. to 6 p.m. daily. For the present, subscribers in Rio have to be called to certain special public call offices in order to receive calls from this country.

The charge for a call to Rio is £6 9*s*. 0*d*. for the first three minutes and £2 3*s*. 0*d*. for each minute or portion of a minute thereafter.

Lastly, on May 23 a limited telephone service was opened between Great Britain (all parts of England, Scotland, and Wales) and the Netherlands Indies (Java) (via Amsterdam). The hours of service are at present restricted to the period from 1.40 p.m. to 5.10 p.m. (British Summer time) each weekday. The service will not be open on Sundays or on public holidays. Subscribers in Java have to be called by the officials there to special public call offices (in Bandoeng and certain other towns) in order to receive calls from this country. The charge for a 3-minute call is £5 2*s*. 0*d*.

Says the Paris correspondent of the *Observer* :—

There are several ways of keeping up your social and business prestige. One is to have a good address. Another is to have a telephone number which sounds well. Now there are two telephone exchanges in Paris which are called Roquette and Menilmontant ; but the districts which also bear these names are in what may be called the distinctly plebeian quarters of Paris. The reorganisation of the telephone service in connexion with the installation of the automatic system has caused a number of subscribers to be notified that they will be transferred from one of these exchanges to the other. A body of them—who claim, of course, to live on the very edge of the unfashionable district—have, however, protested. If they are to be changed, let it be to an exchange which does not place them in the East End of Paris. They suggest Nemours, which is not only a historic and noble name in itself, but also has the advantage of not giving any indication of where the subscriber lives, except that, with such a name, it must be in a select and elegant neighbourhood.

This evokes memories of the days when the old National Company changed the name of " Deptford " Exchange to " New Cross " for analogous reasons.

From the latest returns we learn that the total number of telephones in Germany increased during 1929 by 222,731 to 3,115,120, and those of France by 90,575 to 1,056,034. France has thus now passed the million mark and Germany the three million. Great Britain may be expected to pass the 2 million mark by the end of the current year. At the end of March we had over 1,900,000 telephones.

Quite recently a Chinese military officer (says an evening paper) after being repeatedly given the wrong number, took a bodyguard of troops to the telephone exchange and beat up the offending operator. His emotions will command sympathy even from those who cannot applaud his action. " Never trouble trouble unless trouble troubles you," runs the maxim. It is probably just as well that we have no such opportunity as this indignant soldier had of troubling trrrouble even when it does trouble us.

What troubles us is how you " beat up " a man in the sense suggested by the writer. You can " beat up " a few friends to make a bridge party, or a dance party, or to accompany you in any sort of expedition. You can " beat up " an egg ; but in English we say " beat " in the literal sense of assaulting a man. We suspect an Americanism, the use of which seems to excite in some writers a flattering sense that they are bi-lingual.

When we read in a newspaper " Boring the Vatican—Great Task of Telephone Engineers," we wondered why the good offices of telephone engineers should be considered " boring." The paragraph, however, described the solid walls, sometimes 15 feet thick, which the Italian engineers had to bore when wiring the Vatican for the recently installed telephone system. When we learn by reading further that the 500 inhabitants of the Vatican City are to have 600 telephones between them, we feel that the effect of introducing this much-disputed convenience in such numbers ought to be anything but boring.

Again, when we read that Sir Henry Thornton had spoken by telephone from a moving train in Canada to Trafalgar Square in London, we knew that inevitably and infallibly the train was moving at 60 miles an hour. Nor were we disappointed. All self-respecting trains worthy of journalistic notice do so move. In the late 'forties, Great Western trains achieved that speed, and the ideal mile-a-minute has been a *sine qua non* of public demand ever since. The luckless foreigner with his kilometres has no happy counterpart to it. 100 kilometres (62.14 miles) an hour is a nice round figure, but it has not the popular thrill of " a mile a minute."

" Recently," says the *Architectural Review*," a well-meaning village community council in Derbyshire wrote asking to be put on the track of a really good design for telephone poles. The answer is easy. The present telegraph poles are an excellent design, simple, effective, and now, by custom—which is much in these matters—acceptable. Let not some guileless artist-architect be tempted to give himself away."

The moral is, we think, that most excrescences on a landscape become, as it were, mellowed by custom and age, and blend with their surroundings. The petrol pump will become as familiar as the roadside village pump, which we must remember was not always rusty and picturesque, but new and utilitarian.

We welcome amongst our contributors this month Mr. John C. Craven, whose humorous writings in the *Post* are familiar to our readers.

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THE MAINTENANCE OF TELEPHONE PLANT.

H. G. S. PECK, B.Sc. (HONS.), M.I.E.E.

(*Continued from page* 157.)

ROUTINE visits to subscribers' offices at regular intervals for the overhauling of the equipment are not now made, such overhauls are carried out when a visit becomes necessary to deal with a fault. Private branch exchange operators are asked to make regular tests of all cords, also to make certain speaking and signalling tests for checking the condition of the common battery when this is of primary cells. The condition of local batteries in telephones is verified by making six-monthly transmission tests from the test desk at the exchange, and the results of such tests are recorded on the fault card relating to the circuit concerned. If, however, when the time comes to make this test it is found that a local battery telephone has not been visited within twelve months a maintenance visit is made.

Primary batteries are tested whenever a visit to the telephone is made, and a cell is regarded as unsatisfactory if the E.M.F. is less than one volt after connexion to a two-ohm resistance for one minute or if the internal resistance is more than two ohms for a large cell or four ohms for a small cell.

This method of maintenance is undoubtedly efficient, and has been proved to lead to economy in staff, but the control must be systematic and the overhauls done carefully and intelligently; neglect in this matter leads to an increase in faults, this increase in faults reduces the time available for overhauls, which process continues until the plant cannot be maintained by a staff that should be adequate.

The principal troubles occurring on subscribers' telephones are adjustment faults on bells, switch-hooks, keys and switches, intermittent receiver cords, defective transmitters and damaged apparatus. On private branch exchange switchboards the most frequent troubles arise from intermittent cords, damaged plugs and defective adjustments of signals. A fair number of faults arise from defects in the insulation and conductors used in the windings of magnets and other coils. Faulty cords are exchanged and brought to a repair centre where those fit for re-use are cut down and repaired. Adjustments of automatic dials *in situ* are not permitted, each maintenance man carries a spare dial and this is used to replace a faulty item which is brought to the repair bench at an automatic exchange for attention.

Trunk and Junction Lines.

Daily speaking and signalling tests are made on all trunk and junction lines. These tests are made by the operators if the circuits are available, but if the circuits are not connected to the manual switchboard the tests are made by the engineering staff.

In addition to the daily speaking and signalling tests, insulation resistance and conductor resistance tests are made monthly on all overhead circuits exceeding 50 miles in length, the longest circuits being divided into sections for this purpose. Similar tests are made on circuits less than 50 miles long when testing for faults.

Overhead circuits are regarded as faulty when the conductor resistance is more than 25% above the calculated value, or when the difference between the resistances of the 2 wires of a loop is more than 3 ohms in a testing section, also when the insulation resistance is irregular or less than 200,000 ohms per mile. This value of the insulation resistance is an average and some parts of the line may be below this, but 60,000 ohms per mile is the limit even under the most unfavourable conditions.

Subscribers' Lines.

Subscribers' lines are tested at either 3-monthly or 6-monthly intervals, according to the facilities available. The standard of insulation resistance for a subscriber's line of any length is 250,000 ohms; circuits found below this are scheduled and tested weekly and if the insulation falls below 150,000 ohms, or is less than 250,000 ohms on 4 successive weeks, the lines are regarded as faulty.

Overhead Plant.

Main overhead pole routes are inspected annually and subscribers' routes are inspected every two years. The regulation of wires is subject to visual inspection whenever a lineman traverses the route. Decay of wooden poles occurs between "wind and water," and the condition of the poles at the ground line is checked by tapping. This test is important owing to the possible danger to life and property. Stays are inspected for corrosion and slacking, and checks are made to verify that the conditions have not changed in any such way as to render additional stays necessary.

Terminal poles are inspected six-monthly and distribution poles are inspected annually. Roof poles, owing to the special risks arising from their position, are inspected whenever it is necessary that they should be climbed, special attention being paid to corrosion of the poles and stays and to the fixing of the stays. A general inspection of all other poles is made whenever the pole is climbed in connexion with the localisation or clearance of a fault.

With these methods of maintenance such faults as occur are usually due to malicious or accidental damage or to wind and occasionally to extremes of temperatures. Breakdowns of routes, apart from faults on individual circuits, are caused by storms, floods, snow, falling trees and occasionally by building operations, or the breakage of poles by motor vehicles.

Manholes, Footway Boxes and Ducts.

An inspection of manholes and footway boxes is made at least once a year and the condition of all concrete, brickwork, joists, boiler plates, cable supports, covers, &c., is checked, all corroded ironwork is repainted, the bonding of pipes and cables is checked and tested. Any mud or refuse that may have accumulated is removed and loose covers are adjusted or changed and repacked with yarn and compound. If gas or water is present its source is traced and, if necessary, advice is given to any other undertakers concerned. All visible and accessible portions of cable sheaths and joints are inspected for fracture or damage; it is also necessary to watch for creeping of cables owing to traffic vibration when the route is on a slope.

The principal causes of trouble on underground plant are the works of other undertakings, the reconstruction of roads, and subsidences owing to water or to mining. Cable sheaths and iron pipes are also affected by electrolysis and chemical corrosion.

Cables.

Insulation tests are made monthly on all underground cables carrying trunk and junction circuits. The standard of insulation resistance for main underground cables is 10,000 megohms per mile and for junction cables 5,000 megohms per mile. The circuits are regarded as faulty if the value is less than this or is falling or is variable. Monthly tests of conductor resistances are also made.

Precise methods of localising incipient insulation failures have been developed, and it is possible by their use to determine the position of a fault of several hundred megohms resistance to within one-fifth of a mile on a cable of 100 miles in length.

Such localisation tests are made by a Varley loop test. Tests are made in rapid succession alternately from the two ends of the line until consistent results are obtained. To avoid disturbance by varying earth potentials the testing battery is connected not to earth but to the twin wires of the good and faulty cable pairs. Batteries of a P.D. up to 500 volts are used and connected with the same pole to line at both ends. To avoid irregular results owing to the effect of the charging current, the line is connected to the

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battery for at least an hour and a half before localisation tests are commenced and care is taken not to discharge the line during the tests. The whole of the apparatus used for making these tests must be of the highest grade, well insulated and arranged to protect the staff from the high voltage used. A reflecting galvanometer having a sensitivity of 5 by 10^{-4} microamps per millimetre at one metre is used. When making tests the apparatus and batteries are stood on blocks of paraffin wax which are cleaned before use, the connecting wires used are V.I.R. insulated and the ends are waxed to a distance of 6 inches and not subsequently handled during the test. The exact position in a short length of cable is determined by a Murray test using a slide wire.

Telephone Repeaters.

For the successful and efficient working of telephonic repeaters it is essential that a regular system of testing should be adopted in order that the overall volume of transmission on trunk circuits may be maintained, that speech shall not be distorted and that signalling failures shall be reduced to a minimum.

The first and most elementary test is that of the filament, plate and grid battery voltages and of the filament and plate currents. These tests are made daily on all repeaters.

Every repeater is adjustable to give ten degrees of amplification and each of these is tested at six-monthly intervals and checked with the original value obtained when the repeater was installed.

The efficiency of a repeater when set at the amplification proper to the circuit in which it is connected is measured weekly at a frequency of 800 cycles and at varying frequencies half-yearly. These tests are known as "gain" tests, and are made by connecting the repeater between two lengths of cable and comparing the attenuation over this repeatered cable with that over a similar cable without repeaters. The input is obtained from a valve oscillator, and the received current is amplified and rectified before measurement. A departure of not more than $\pm$ 1 decibel from the specified gain for any repeater is permitted.

The continued agreement between each balancing network and the line with which it is associated is checked quarterly by observing the maximum amplification possible without oscillation.

In addition to the foregoing tests of every repeater, tests are made at half-yearly intervals of the overall volume efficiency and speech quality on repeatered trunk circuits. For making the volume test both ends of a circuit are provided with test sets capable of sending through a definite impedance and accurately measuring a current of between 2 and 3 milliamperes at 800 cycles and of amplifying and rectifying and indicating the received current. The sending end advises the receiving end of the sent current and of the closing impedance to be used; the receiving end measures the received current and compares it with that obtained by testing with the same sent current through a calibrated cable having the specified efficiency of the trunk circuit under test. A maximum departure of $\pm$ 1 decibel is tolerated. The speech quality tests are made by transmitting actual speech in the form of disconnected words and figures and checking that they are correctly heard without undue repetition.

(To be continued.)

THE SHANGHAI TELEPHONE JOURNAL.

WE welcome the appearance of the first issue of our new far-eastern contemporary, a journal published in the interests of the staff of the Shanghai Mutual Telephone Company. It contains articles descriptive of its aims, on Fault Prevention and on Automatic Telephony, notes and comments and personal items.

Run on similar lines to our own journal by contributors drawn from the staff, it has our best wishes for a successful career. It is well printed and got up.

MORE NOTES ON THE TELEPRINTER.

BY JOHN C. CRAVEN.

THE origin of the teleprinter is a matter on which there has been a great deal of speculation. Where did you come from, baby dear? Out of the everywhere into here! Members of the Traffic Section believe that it came as a direct answer to prayer. The legend runs that a traffic officer was seated one day in Hyde Park feeling very discouraged and disconsolate when he felt a touch upon his shoulder. Looking round he saw a beautiful vision. "Go away," he said. "You know what the police are like round here."

"I'm not that sort of girl," she replied. "I'm your good fairy!"

"All the same," he said, "your presence is very embarrassing and the world is very censorious: I think you'd better go away."

A tear glistened in her eye. "Every time I materialise, and appear to mortals, I get the same reception; I am shunned for fear I shall compromise somebody."

"Well," he replied, "you must admit it's very awkward for a chap to be seen in a public place with a girl in a ballet skirt, even if she does carry a wand. However, what do you want?"

"You are distressed," she said, "and I want to help you. Tell me your troubles. Is it because your ugly sisters won't let you go to the ball?"

"No," he answered emphatically, "it isn't. You're a few centuries out of date. It's because I can't find exactly the right kind of telegraph instrument to rehabilitate the British Telegraph Service."

"If that is all," she replied, "it is soon remedied. Fetch me a pumpkin."

"Good heavens! do you think I carry pumpkins concealed about me?" he said with irritation. "I might search all London without finding a pumpkin."

"In that case we will make this stone serve." And so saying she touched a large stone on a nearby rockery with her wand, and it turned into a teleprinter. He gazed at its black, shining case with astonishment, and then turned to thank his benefactress; but she had vanished. Thoroughly dazed, he picked up the bulky instrument and staggered out of the Park, followed by a large number of plain-clothes detectives, who thought the circumstances highly suspicious. Accosted by one of them with an inquiry as to the nature of his burden he replied that it was a typewriter. "Oh," said the detective, "if you must carry your writing utensils about with you, don't you think it would be much more convenient to use a fountain pen?"

That, as I said before, is the legend; but I think that all accounts attributing a miraculous origin to the teleprinter may be discounted. I have gone into the matter very carefully and find that the reality is much more prosaic. A certain jobbing mechanic named Beaker had a typewriter brought to him for repair, which he carefully took to pieces. During his absence his small son entered the workshop and seeking a means of diversion mixed up the parts with those of a knitting machine also awaiting repairs, and a few odd motor parts which were lying about, together with odds and ends from his Meccano set. When Beaker returned to his workshop, and had dealt suitably with his son, he set to work to make the best of a bad job. He was a man of grit and resource, and with great ingenuity managed to build up a machine in which every part was utilised. This explains why the teleprinter contains so many separate bits and is a compendium of every mechanical and electrical principle ever discovered. He was a bit staggered at the result, and when his client saw it he said it was a good typewriter spoilt, and refused to have it back. Unable to dispose of it as a typewriter Beaker put four wheels on it and tried

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to sell it as a Baby Austin but could not find a buyer. Then the man who had left the knitting machine called round, and when he saw it he shouted "Eureka," which means "It's the goods." Strangely enough, its telegraph possibilities were not at once realised, but it was extensively used for some years for type-keyboard knitting, a big advance on the old method of taffling wool with a pair of skewers.

When first used for telegraph purposes it was not, of course, in its present finished state, and was cynically known as the "start-stop" instrument; because no sooner was it started than it stopped. The average amount of working time lost per day was then 12 hours, but the stability has since been improved, and instead of working time lost we find it being called upon to put in a little overtime outside its normal working hours.

The advent of the teleprinter has brought into being a new class of telegraphist—the maintenance officer. He examines it through a small instrument held to his eye, like a duchess using her lorgnette, which gives him an air of great distinction. He is very proud of his machines, and a maintenance officer was very much distressed the other day by the thoughtless remark of a visitor whom he was showing through the instrument room.

"I see you're doing good business," said the visitor.

"As a matter of fact," replied the M.O., "we're rather slack at the moment. Why do you say that?"

"Well—look at all the cash registers you are using."

The future of the teleprinter in the telegraph service appears to be assured. It is easily reared, behaves well in captivity, is clean in its habits and can be trusted with children. The staff has taken so kindly to it and so much is it esteemed that good telegraphists when they die and go to heaven now expect as the consummation of their bliss to spend eternity sending upon a golden teleprinter.

OBITUARIES.

SINCE the issue of last month's *Journal* the C.T.O. Retired List has suffered severe losses in the "passing" of no less than three of its members, thus:—

Mr. J. N. Geary, who retired owing to ill-health early in 1914, while carrying the rank of Assistant Superintendent, 2nd Class.

A stroke preceded his death but by a few days, and he fell asleep in his 72nd year on the 4th ult.

Much respected by his colleagues, it will be recalled by those whose memories carry them back so far, that, both Mrs. Geary—who survives him—and a sister were also formerly on the C.T.O. staff. The fact will also be remembered that our colleague was at one time a member of the 49th Middlesex Rifle Volunteers.

By a strange coincidence one of Mr. Geary's contemporaries, Mr. W. J. H. Joyes, also a member of the 49th, and who also compulsorily retired on account of failing health, was laid to rest during this same month. Mr. Joyes was long and affectionately known as "The Marquis," due to his meticulous dress, manner and bearing, and formed one of a circle of kindred—may it be said, Beaux Brummels of the eighties?—all of whom rose to responsible positions. One may mention the names of G. Adams, W. J. Bond, H. D. Gill, Trezise, F. White, in support of the statement, adding thereto Messrs. MacEwan and H. H. Trollope to complete a group reckoned among the most popular and capable officials of the old school.

Mr. Joyes, whose father was for many years the Postmaster of Midhurst (Sussex), was gazetted Asst. Supt., First Class, in 1907, but retired in 1909 from the cause already stated. He was in his 75th year, his wife, formerly Miss L. Newton, of T.S., pre-deceasing him a few years ago.

The third blow was that of the unexpected death of Mr. John Buchan Murray, a man of strong convictions, though not intolerant concerning those of other folks, even his intended lacerations mellowing into kindly utterance. Under doctor's orders for a few days, then "God's finger touched him and he slept." It was as he would have wished. On his retirement it was not in the nature of J. B. M. to seek out a *dolce far niente* existence. Activity—reasoned, if you like—but activity, purposeful and unselfish, was bound to have been his motto, and Torquay was all the better for such an one in its midst, from which town have already arrived tokens of his "sterling character," and the "asset" J. B. M. proved to the community.

From Mr. C. S. Keen, who, with Mr. C. D. Bennett, late of T.S., represented Old Colleagues at the graveside, comes the following brief account of the service in Ellacombe Church, South Devon:—

"The service was held here to-day (May 14), in Ellacombe Church, of which 'Joe' for long had been a prominent member. There was a full choir, the vicar taking the service, the softer notes of the organ accompanying the cortege with "Oh, Rest in the Lord," as we slowly made our way to his last resting place. Here the vicar paid happy tribute to our beloved colleague's character in his religious life, which evidenced itself in practical work in connexion with the church, not least, indeed, in his strict integrity regarding finance, &c., &c. Among those present in the numerous congregation were: F. T. Wadley, J. Slade, A. J. Jellie, C. H. Honeysett, J. James, Charles Strutton Keen (C.T.O.), R. J. Collihole, R. J. Clancey and A. R. Simmonds (Torquay), B. Bennett (Cardiff), Donaldson of Exeter, C. T. Rowe (L.P.S.), S. G. Bryant (E. in C.O., Hereford)." J. J. T.

LONDON TELEPHONE SERVICE: LEAGUE OF NATIONS UNION.

THE inaugural meeting of the L.T.S. Branch of the League of Nations Union was held on April 24, at Cornwall House.

There was an encouraging attendance, people from all grades of the L.T.S. being represented.

The Controller, Mr. W. H. U. Napier, President of the newly-formed branch, took the chair. He commented on the fact that the meeting was held opportunely on the day following the conclusion of the Naval Conference, and introduced the speaker of the evening—Mr. Alec Wilson.

Mr. Wilson began by describing the League of Nations as a permanent conference of Governments. The League of Nations Union was a voluntary body designed to create and encourage the support of public opinion to the League. The Union, he said, had been growing steadily at the rate of 200 members per day for the last 12 years, which shows how people are realising that the League is a need of the present day. He pointed out that the Union was financed only by the contributions of its members, and that it belonged to no party or creed.

Referring to the League, Mr. Wilson remarked that modern science had so shrunk the surface of the world and so increased the speed of communications, that the League of Nations, a a permanent conference where the men who are running the world can discuss affairs of common interest, is a necessity. All nations—like most men—prefer peace to war, as long as they are getting their own way, and the principal function of the League is to settle disputes peacefully in the interest, not only of the countries directly concerned, but of all the countries who would be affected in the event of a war.

The League of Nations can be most aptly explained by a parable of the motor-car. The Governments of the countries may be compared to the engines, while the function of the League corresponds to that of the gear-box which, while it has no power of its own, enables the other parts to work in co-operation.

Mr. Wilson concluded by saying that the League of Nations deals with an immense variety of subjects—all of them subjects upon which action was necessary but on which no country could take successful action alone.

Advantage was taken of "question time" to ask Mr. Wilson what reply he could make to the frequently advanced objection to the League, that it is contrary to human nature, and that when a country becomes over-populated it must resort to war to obtain colonies to which its surplus population can migrate.

Mr. Wilson pointed out that cannibalism, slavery and duelling were once practised, but with the advance of civilisation these evils had been repressed, and so in time, with the greater advance of civilisation, war must also go. Experience has shown, too, that war is not a solution of the problem of over-population. What the remedy is nobody yet knows. The only solution at present seems to be supplied by nature in that over-population is followed after some time by a decline of the birth-rate.

The last question, which aroused general interest, was "what is the League doing to combat the inculcation of the child mind with sentiments of national aggrandisement and false patriotism?"

Mr. Wilson said that it was the British representative in 1923 who formulated a plan for inculcating right ideas in schools and removing the mental poison in the idea of "national glory." The League, he said, was killing the sense of national arrogance without killing national self-respect: co-operation between national units, and not the extinction of national spirit, was the note of the League.

Mr. H. Dive, the Assistant Controller, proposed a vote of thanks, which was warmly accorded, to Mr. Wilson and Mr. Napier, and the meeting was declared closed.

LANGUAGE SCHOLARSHIP.

MISS ALICE Y. C. WOOD, daughter of Mr. J. Wood, Postmaster, of Worcester, has gained the Modern Languages (Travelling) Scholarship from Durham University. Miss Wood was, until July, 1928, a pupil at the High School for Girls, West Hartlepool, and is now at St. Mary's College, Durham.

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PUBLIC TELEPHONE SERVICE TO AUSTRALIA.

(*Illustration on page* 171.)

SINCE the last issue of the *Journal* the Australian Service has taken its place among the rapidly increasing long-distance wireless telephone services. The service is given by "short wave" from Rugby, with reception at Baldock, the corresponding points near Sydney being Tennants Hill and La Perouse.

The official opening of the Service was preceded by a few days trial for service purposes between the officials of the Administrations, and the opinion was confirmed by experience that the Australian circuit gave service which equalled, and perhaps excelled, that of the short-wave circuits which carry Anglo-American traffic.

The inaugural speeches between the Premiers of Great Britain and Australia on April 30 were an outstanding telephonic success, not a syllable of them being missed. Mr. Macdonald's colloquial parting words to Mr. Scullin gave just expression to the feelings evoked in speaking over this circuit. Australia is no longer far far away; formal adieus are obsolete; Australia is within call!

The amount of traffic offered for the service is extremely pleasing. For the first week the demand outward and inward was about equal, but at the time of writing the traffic from Australia is tending to draw ahead. Extension to European countries generally, was in request almost from the opening day, and beginning with France, there has been an extension to a new European country almost every day, so that by the end of May nearly every western European capital and country will be able to communicate with Sydney, Melbourne, and Brisbane.

Mention ought to be made of the keen interest taken in the venture by the Press in both countries. Two prominent London papers were among the first users; and the Australian telephone and its doings were the staple placarded news of the afternoon and evening editions.

The large difference in clock time (Sydney is at present nine hours ahead of London time) and the restricted hours of service 7 a.m. to 10.30 a.m., 4.30 p.m. to 10 p.m., although handicaps, are not seriously discouraging callers. Disturbance during the night hours is willingly suffered in Australia; indeed, co-operation from Australian subscribers and telephone personnel is all that could be desired.

T. H. G.

REVIEWS.

"*Transmission Networks and Wave Filters*," *by T. E. Shea, M.S.* (*Chapman & Hall, Ltd., London.*) 32*s.*

The book is based on a series of lectures delivered by the author to the staff of the Bell Telephone Laboratories, and gives fully the calculation and design of transmission networks and wave filters.

The introductory chapter deals briefly with the necessity for and the functions of different types of network used in telephony. As an illustration a description is given of the networks required for the American type C carrier system, whereby three carrier circuits and one audio circuit and also a sub-audio telegraph circuit are accommodated on one pair of aerial lines.

The engineering limitations which cause divergence between theory and practice are discussed. The remainder of the book is divided into three parts. Part I deals with the principles of transmission networks. It starts with definitions of general terms and units used in transmission measurement. The main principles on which network theory depends are developed and reference is made to hyperbolic functions.

The general properties of networks are discussed, and losses due to reflections and total insertion losses, and also the effects of impedance deviation are fully dealt with.

Part 2 deals with electric wave filters.

After giving the general properties of ideal filters and how filters operate, the more common types of filter are discussed.

Multisection filters, low pass, high pass, band pass, and band elimination filters are described and their theory given.

Part 3 deals with the composition of transient waves.

The method of analysing the various types of waves which occur in electrical transmission by the Fourier analysis are given.

As examples the use of the Fourier analysis is applied to various phenomena met in telephony, telegraphy, television, and telephotography.

At the end of the book a very extensive bibliography is given, to which frequent reference is made throughout the text.

While the treatment of the subject is entirely theoretical, the book contains many diagrams which illustrate the practical application of the theory, and the limitations and possibilities of design.

The arrangement of the text is such that each part follows directly from what precedes and the book can be recommended to all who are interested in the subject, and who desire a comprehensive text book for study or for reference.

"*The Theory of Electrical Artificial Lines and Filters*," *by A. C. Bartlett, B.A.* (*Chapman & Hall, Ltd., London.*) 13*s.* 6*d.*

This book is intended as a general introduction to the theory of artificial transmission lines, line balances, filters, and phase shifters. The treatment of the subject is entirely theoretical, and throughout the text references are made to other works in which particular sections of the subject can be studied in greater detail.

After dealing with the theory of T. and T. section artificial lines with varying terminating conditions, the most general types of artificial lines are discussed and the general theory of repeated networks is given. In the third chapter continued fractions are introduced and ladder networks are dealt with from this standpoint.

In subsequent chapters the theory developed in the first three chapters is applied to various particular cases, some of which are of no great practical value, while in other cases such as that as the coil-loaded cable, the treatment is of practical interest, and is also much simpler than deriving the formulae from first principles.

The section on wave filters deals with the simpler types of filters and phase shifting networks. A chapter on homographic transformation and circle diagrams, and a chapter on the general theory of the multistage amplifier conclude the volume.

The subject matter is clearly set out and well illustrated by diagrams. For those students who intend to pursue the study of the subject to an advanced stage the book should be both interesting and useful.

"*Radio Data Charts*," *by Dr. R. T. Beatty, M.A., B.E., D.Sc.* (*Published by Messrs. Iliffe & Sons, Ltd.*) *Price* 4*s.* 6*d.*

This is a series of diagrams, or "abacs," by which any of the usual calculations which occur in the course of designing wireless receiving apparatus can be solved purely graphically and without any arithmetical operations whatever. It is only necessary to lay a ruler across the diagram and to set it to the given data on two scales to obtain the result where the ruler crosses the third scale.

Each diagram is preceded by an explanation, so that it can be used by even the veriest tyro in the science.

The diagrams are reproduced very clearly and the paper on which they are printed is good. The collection should prove of great utility to all who are interested in the design of wireless receivers.

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THE OPERATOR AND THE TRUNK CALL.

BY R. S. GROSVENOR (SOUTH WALES DISTRICT).

THE words indicating the title of this article represent a most essential part of telephone work.

It is of vital importance to both commercial and social life that a thoroughly efficient and smooth working trunk service should be maintained. In order that this shall be assured continuous study by highly-trained technical and traffic officers, many of long experience, is always in progress. This study is necessary in order that the most efficient type of internal and external plant may be available and that such plant is utilised to the greatest advantage.

Improvements in circuit arrangements and switchboard equipment are being constantly introduced in order to minimise delay and ensure that the best apparatus is available for the use of the operator. Research has extended the reach of the telephone, has made telephone service more and more efficient and broken down the barriers of time and distance. The successful operations of the service is in the operator's hands and it is the purpose of this article to deal with that phase of the work.

The viewpoint of the operator in dealing with a trunk call is all-important. When making a trunk call the calling party generally has the cost of the call in mind and is consequently more critical than in the case of local or junction calls. If the call is in every way satisfactory a good impression of the service is created often tending to increased use. Inversely, if a trunk call is unsatisfactory for any reason which the calling or called party considers to be within the Department's control an unfavourable impression is created tending to discourage use and even cause prejudice.

It is not sufficient, however, for a call to be satisfactory. The call should be *sold* in such a way as definitely to encourage use and the telephone habit. An operator is a highly skilled officer whose work calls for tact, patience, a pleasing manner with courtesy under all conditions, quick to grasp the special needs of an occasion and a natural facility of imparting and gaining confidence. It has to be kept in mind that all this requires to be carried out solely by means of the voice—at present—without any helpful atmosphere, physical gesture or personal element of any kind.

The attitude of an operator in approaching a trunk call is therefore all important. Speed of answer, speed of clear, prompt attention to supervisory signals, establishment of conversation without delay after the attention of both parties has been obtained, announcement of periods, viz., 3, 6 and 9 minutes, at the proper time and in the correct manner, require very careful treatment, but to supervise and generally *sell the call* as to leave only the very best impression is of the utmost importance. The tone of voice can make or mar, destroy confidence or encourage use. For a caller to realise that an operator is doing everything possible to meet requirements can only be done by great care in manner of speech, clear, incisive, always pleasant, but without exaggeration.

The trunk call is the more expensive telephone facility for sale and is generally purchased by persons immediately interested in the cost, often on important or vital business. This point is made to impress the necessity for encouraging use by every means in our power. A careful watch requires to be kept that there is no suspicion of casual or uninterested operating. An impression that an operator is not fully interested in the call being dealt with is fatal and immediately reacts on the user.

There is more sorrow over one trunk call that is lost than rejoicing over the ninety and nine that are entirely successful.

A further point requiring always to be borne in mind by the operator is the necessity for *immediately reporting* any appreciable difficulty coming under notice in connexion with a trunk call. This should be a strict practice *at all exchanges*.

Transmission trouble, e.g., inability to hear either calling or called party, inability of parties to hear each other after a connexion has been established, intermittent difficulty resulting in premature disconnexion, false supervisory signals or failure of supervisory signals, &c., should be brought under notice without delay through the appropriate channel.

It is found helpful for travelling supervisors and traffic officers to deal with the following points as a matter of routine when making periodic visits to exchanges :—

(1) Check of duration and timing in operation and recording trunk calls.

(2) Any undue delay or difficulty in obtaining trunk calls through other exchanges.

(3) Any cases that have come under notice of officer-in-charge or operator regarding difficulty experienced in transmission or coming under actual notice at time of visit.

(4) Details of test calls made in connexion with item (3) quoting the number of each circuit used.

(5) Particulars of excessive faults on trunk circuits, also details of any undue duration.

Now a word as to the operator giving assistance to trunk users. A caller should never be *left in the air*, in doubt of what is happening.

Nothing is more irritating than to be told "Your London call" or "Your number is waiting, please speak," and then to have to wait for an appreciable time, which, of course, always seems to be very much longer than it is in fact, before anything further happens. This is a prominent source of annoyance and causes a user to become predisposed to complain of any subsequent incident during the progress of the call, perhaps even of a trivial nature. Every fraction of a minute saved means a service that is more prompt, more effective, more economical. Despatch is the soul of business !

A trunk call cannot be too carefully supervised. Every possible assistance that is necessary should be given by the operator at all times, in a willing and careful manner.

The point of view of a caller may differ strongly from that of the operator, nevertheless strict courtesy on the part of an operator must always be fully maintained, in order that difficulties may be convincingly explained and any tendency to discourage use avoided.

For efficient and satisfactory working the co-operation of the user is essential, and it is proposed to deal with this side of the question in a subsequent article.

The facility with which an operator rises to the occasion in emergency, rush traffic or for any other reason is well known, but it is the little things that count and it is necessary carefully to guard against slipping back in operating methods. The motto "Forward" should be kept well in mind.

The *best* is just good enough for the telephone service. This is the department's aim and every effort is continuously maintained in order that a telephone service shall be available so far as practicable free from imperfections, errors and delays and shall enable anyone at any time to use a telephone and speak to anyone anywhere quickly and at a reasonable cost.

The function of the operator is fundamental; that this will be carried out with ever increasing efficiency there can be "no possible doubt, no possible, probable shadow of doubt, no possible doubt whatever."

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PEREGRINATIONS THROUGH THE BROADCASTING WORLD.

BY J. J. T.

IN the pioneer days of radio broadcasting, not so long ago, even measured by the most modern of time-standards in progress, the engineer in charge has himself been called upon to provide the programme and that with very little of the wherewithal to do so. The writer has indeed known more than one case where the electrician was also "uncle"—in addition to his engineering duties—being assisted by a scratch crew of fourth-rate amateurs obtained at the price of a cab fare to the studio. There were, of course, volunteers in plenty attracted by the novelty, but in these cases it was not infrequently discovered that the value of the actual *deed* was very much below the *will* to do!

Swift indeed have been the developments since those "joyous days"—as a young engineer friend of mine termed them—and to-day it needs not the waste of ink to emphasise how complex has become the organisation of both the technical and the programme features of this new art, demanding highly trained and alert specialists in both departments.

The few columns that follow are not intended to be more than a collection of co-related items from one's own note-book, jotted down within the last two years of rambling among some of the wireless literature of the world. Taken at this face value, it is hoped that, scrappy as such notes must necessarily prove, they will nevertheless be interesting as showing how quickly broadcasting has made its way into the hearts and minds of the nations, even to the condemnation of raucous loudspeakers!

Now as to developments; let us take the U.S.A., on the point of numbers, one would not say of all-round efficiency and control. The Chief of the Radio Division of the Department of Commerce of the U.S.A. gave the following official figures during the Committee stage of the Department's Annual Supply Bill. "In 1922 some 60,000 homes were equipped with wireless receiving sets, the actual audience, it was computed, being less than 80,000. Last year at least 10,000,000 were in possession of receivers." The Radio Manufacturers' Association maintains that although since 1922 no less a value than £500,000,000 worth of wireless apparatus has been manufactured in the States, "there is no saturation point in sight yet." Unless one's memory serves badly, this last statement was made prior to the Wall Street crash.

In any case the total value of the radio sets utilised for listening-in throughout must therefore be immense, when it is realised that nowadays every country is potentially in instantaneous touch with the world's news.

In 1920 there were certainly less than half a dozen working stations on the entire globe, to-day the number broadcasting runs well into four figures.

In February of the present year the White Star Liner *Majestic* made a most successful broadcast which was relayed by the B.B.C. to millions of listeners in Great Britain, this, too, while steaming 1,300 miles out from Southampton, in the Atlantic. Latterly pictures and television pictures have been dealt with experimentally, notably in Great Britain, France, and Germany. The recent exhibition by the Television Society in London gave some real indication of the enthusiasm among amateurs concerning these, the last phases of radio broadcasting. On the Continent the Witzleben and Posen stations have been to the fore regarding the broadcasting of simple pictures, while Berlin has diffused television daily for some time past. Denmark, from Lyngby, has also experimented with both systems.

For the greater part the countries of the entire world have made a success of this new educative and recreative agency.

It has, however, not made much advance in India, where the many tongues spoken, and the difficulty of providing satisfactory programmes for so many differing types of psychological outlook, constitute a very thorny path for the organisers to tread, be they who they may. Authoritative reports from India denote surprise that "broadcasting" has not yet caught the imagination of the people of India, but counsel patience and gradual penetration. At present there are under 10,000 licenceholders for the whole of India, but from the same source it is gathered that there is more than mere suspicion behind the belief that, judging from the number of sets in the country, there is a considerable crowd which is persistently evading payment of the licence. It is not easy to send round a detecting van outside the large cities where the population is scattered and distances are very great. The difficulties of detection have been very successfully met in Great Britain, and one feels inclined to forgive the natives of the "coral strand" when one reads that in Belgium "whereas it is known that there are no less than 200,000 receiving sets in use in the country, the actual number of licences actually paid for had not yet reached the 10,000 figure when the report was issued." The annual payment is only seven shillings.

Reverting to India, there appears to be some dissatisfaction in Burma due to the low power available at the Burma Radio Club, which is apparently responsible for the functioning of the Rangoon Station. That power is only 750 watts and the matter, it appears, is to receive some consideration by the Government. Coming nearer home there was similar trouble in Jugo-Slavia a short time back on account of the inefficiency of Zagreb as a broadcasting station. Here, again, pleadings for assistance from the authorities had become very vocal.

On the other hand the new station of Bratislava in Czecho-Slovakia has been giving good results, since its opening last year. It is noteworthy that 67% of the Czecho-Slovakian licenceholders use receivers of the crystal pattern. The fact that these prove satisfactory is no doubt due to the small area of the country and its politico-geographical position, which enables the authorities to "fully avail themselves of the various international telephone cables round about them," which by arrangement with their neighbours enables the Czecho-Slovakians to receive by telephone some of the more important programme items from the surrounding capitals, *relaying* the portions thus received for local pick-up.

SOME FEATURES IN LICENCE CONDITIONS, &C.

The Swedish broadcasting arrangements are run by a private company under the authority of what is known as the Royal Telegraph Board. There are about 400,000 registered listeners (owners of receivers) to a population of six millions. The licence fee is the same as that of Great Britain, the equivalent in Swedish money of ten shillings. The number of registered listeners is still rising steadily, and without interruption.

Under a recent law in Denmark listeners are to pay a fee of 10 kronen (eleven shillings) for the financial year April 1, 1930, to Mar. 31, 1931. Licences purchased during the short period between Dec. 15 of this year and Mar. 31 of next will be reduced to 5 kroner, that is for the remainder of the financial year. Whether this arrangement is exceptional for this particular financial year or is to be a standing one for future years is not stated. Blind, crippled, and all chronic invalids in Denmark are entitled to free licences.

In Czecho-Slovakia similar conditions have been established by law for blind and "totally disabled" persons who require a wireless licence. In the last-mentioned country certain schools are also exempt from licence charges.

The Spanish authorities tax *each* set, but discriminate between crystal and valve receivers. On the former one peseta (about eightpence) is charged, payable every three months, while five pesetas per quarter are charged for valve receivers, and an *ad valorem* tax of 5% is made on transmitting apparatus.

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A usually trustworthy informant states that quite recently all secondary schools in Brazil have been equipped with all-electric receivers. As it is added that suitable programmes compiled by a board of teachers are broadcast for this particular service, it appears evident that the arrangement is backed by official authority.

The district Post Offices of Germany are now authorised to permit receiving sets to be installed "on approval." A trader writes to the local postmaster and gives particulars of the proposed purchase and purchaser. No fee is, however, charged during the next eight days. Should the would-be purchaser disapprove within that period the set is removed and the Post Office duly informed. Should the trader's client agree to purchase, the district Post Office is advised to that effect and at once forwards the licence to the prospective owner.

According to a report of H.M. Consul in Formosa, no fee at all is charged for listening-in in that far-away island. There are actually no restrictions on receivers, while only 20% of these are of the valve-type, the remaining 80% being "crystals" manufactured in Japan. The programmes are usually delivered in Japanese, but occasionally Chinese and English are used.

All broadcasting in Russia is controlled by the Radio Department of the Commissariat of the People for Posts and Telegraphs. Commercial concerns are allowed to operate their own transmitters but technical matters are under the direct control of the Commissariat as above. There are 63 transmitting stations, but the number of registered listeners (? owners of receivers) is comparatively small, because, so it is stated, "registration is only compulsory from the month when one's district station of from 12 to 20 kw. begins to operate." The towns contain 282,045 registered listeners and the country districts 44,240, so the last report states. The total of actual listeners is estimated at eight millions. The registered public loudspeaker sets amount to 9,792 in the towns and 6,533 in the country. These figures do not include those in the streets, the squares, and public gardens. The two last paragraphs may account in a measure for the small number of licences issued in so huge a country as that ruled by the Soviet Government.

The Uses and Abuses of Broadcasting.

Just as, despite its obvious utilities the *use* of a motor car when carelessly or selfishly handled may become an *abuse*, so with broadcasting. To the British mind the exploitation of the ether for advertising the doubtful virtues of someone's soap or the absolute necessity of purchasing certain quack medicines savours somewhat of sacrilege. There are other countries which apparently have other views, but on the whole the countries of the world, so far, are overwhelmingly on "the side of the angels." To broadcast dance or other music from the *Crested Eagle* or the *Royal Sovereign* as they plough through the murky Thames, or as the *Hindenberg* may do up the Rhine and at several German watering places—so far as it does not unduly disturb the normal amenities—may be permissible, though it is very doubtful whether the unrestrained use of the loudspeaker in the upper reaches of London's own river does not at times amount to an offence against good taste, to say nothing more.

Regarding the "loudspeaker," most countries have experienced the difficulty of dealing with the uncontrolled use of this part of radio apparatus, endeavouring wherever possible to bring offences within the legal circle of existing law. In Great Britain this appears to be possible by local by-laws such as those recently framed by the Westminster City Council referring to "nuisances caused by the use of loudspeakers *and* gramophones." In France the Mayor of Chateldou has prohibited the entire use of loudspeakers after 10 p.m. in summer and 9 p.m. in winter. In Vienna, last August, the Chief of the Police in that city threatened fines of £6 or 14 days imprisonment for anyone who has his window open at the same time as his loudspeaker is working, or who uses a loudspeaker after 10 p.m.

In the U.S.A., the town of New Rochelle has passed a new law making it illegal to annoy one's neighbour with a loudspeaker before 7 a.m. or after 10 p.m. Nothing is said concerning the period *between* 7 a.m. and 10 p.m. ! The Chief Magistrate of New York, in instructing magistrates under him, maintained that as the law stands in America at the present time, it prohibits unnecessary noise and holds perpetrators guilty of disorderly conduct. He added that under the law, "no person had a right to make any noise which would penetrate beyond the confines of his own home." A New York lawyer thereupon refused to pay his house rent as a protest against the noise of his neighbour's loudspeaker. Mr. F—— gave evidence that the tenant two floors above him operated his loudspeaker night and day, and protested to the magistrate that he should not be forced to pay rent for apartments which resembled a cabaret more than a home. That seemed logical but it puzzled the magistrates, and the last the writer heard of the case was that they were still puzzled !

(To be continued.)

TELEPRINTERS IN THE MAKING.

By B. S. T. Wallace, C.T.O.

A searching, penetrating, lingering unmistakable odour: such seemed to be the one lasting impression recorded by a visit to the telegraph works of Messrs. Creed & Co., at Croydon. As this gradually wore off the memory of other interesting things came to the surface and it was thought worth while to record them.

Had it been the original intention to describe this visit these columns would no doubt have been adorned with workshop photographs and festooned with facts and figures, so perhaps the omission of many things that might otherwise have been noted can perhaps be overlooked while you in imagination take a walk round.

Some years ago I had occasion to visit Messrs. Creed's Works, and partly from curiosity as to how such a sudden heavy call for teleprinters was being met in what was a comparatively small building and also the desire to learn how certain parts were actually made and their limitations, I sought a further visit.

The works have already been augmented by temporary buildings pending the construction of a permanent six-storey structure to cover the site now occupied by the present one-storey buildings.

Needless to say, there is much activity everywhere, plenty of overtime, and I understand a night shift may also be introduced to cope with heavy demands, for not only teleprinters but morse apparatus also.

There is such a maze of machinery and processes that one would require several days and the company of the various individual experts to obtain even a slight acquaintance with the whole of these works, and many questions that might otherwise have been asked simply had to be left for lack of time. The order of progress through the ramifications of the various shops is a somewhat uncertain memory, so I will give a few impressions and detail any interesting things gleaned on the way.

The tour commenced at the principal machine shop. Here one is introduced to what on first acquaintance appears to be a Heath Robinson nightmare. It contains hundreds of drilling, boring, and cutting machines; not simple things, but great robots with mechanical brains, adjusted to less than the thousandth part of an inch, each designed for turning out one particular part. They are worked from a perfect maze of overhead belts and shafting. There is only just room to creep cautiously between these machines. (This system of belt and shafting will be replaced in the new building by individual electric motors to each machine.)

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It was only possible to take a momentary glance at some of the various operations in this building, including the cutting of the ingenious cam tracks from the heavy steel rod and the boring out from solid blocks of metal the cores and magnets for the relays. The latter operation was more or less hidden by the continuous stream of cooling liquid flooding the whole process. Girls are employed on a few of the lighter machines, such as engraving; one such operation being the cutting of an identity number in the typehead combination combs.

Despite the apparent congestion there was in this shop a noticeable atmosphere of cleanliness and comfortable warmth. Even in the most fleeting of the temporary buildings the radiator system would have won the heart of any New Yorker.

The next department contained retorts and other apparatus for tempering and hardening the various steel parts, conspicuous among which were the relay and other strip connecting rods, combining lightness with strength and rigidity.

Then came the stamps, cutting out from steel plates such things as key bars with the same facility as the hole is punched in a tram ticket.

The enamelling room, where the covers and bases are given their glossy black coat by means of spraying apparatus, is of special interest. It all looks so simple and easy that one longs for some such device for ordinary domestic decorations. There is one drawback, however. The fumes are harmful—whether to health or from risk of explosion I did not enquire—so the operations are done in an alcove in front of powerful exhaust fans.

I have a faint suspicion that my guide intentionally lingered in this room in gleeful anticipation of witnessing my olfactory reaction to the next department. There is a distinct fascination in the smell of this enamelling process. One gets the impression that if it were not for the suction fans a state of pleasant inebriation would quickly be induced. So the contrast to what was to follow was the more marked.

We pass on. The next door is opened, but before my head is inside I involuntarily exclaim "Fish, rotten fish!" and to complete the illusion appear a number of tanks and the sound of running water. But there are no fish. This is the plating room, drenched with the fumes of deadly cyanide of potassium. There is no mistaking it. A warning in flaming red letters proclaims "That scratch may lose an arm. Go to the dressing station at once!"

The fumes alone are calculated to make a cut fester; yet, like the proverbial arsenic eaters, the staff seem quite inured to it all. Apparently there is no risk to those in perfect health, and of course all needful care is taken by the provision of such things as rubber gauntlets.

You will notice that certain steel parts of a teleprinter, such as the keybars and locking bars, have a silvery sheen a little brighter than lead but not so bright as silver. This is an electrolytically deposited coating of the uncommon metal cadmium. This is considered the most serviceable medium for preserving the surface of steel from oxidation and rust.

Electro-plating is always an interesting process to watch, but on this occasion I was glad to pass out into the fresh air and across to one of the temporary buildings.

This "temporary" building is intended to last 18 months. It is built of bricks of a new pattern, having a ridged surface, handsome in appearance. I am quite sure, if it were allowed to do so, this structure would outlast many of our modern so-called "ideal residences," which seem to be built of brick not far removed from the clay huts of the Ancient Britons.

This building contains several departments, including assembling, testing, research, demonstration. When the teleprinter parts are finished a "complete" machine is built up from them. This complete machine is then passed to experts who dismantle it to the last screw and assemble it again, but this time fitting and testing each part as they go. The "finished" instrument is then put to a continuous running test for two weeks. After passing this it is ready for service.

One could spend a day in the test room, but I had to be content with a glance at two teleprinters (3A in P.O. nomenclature) undergoing a breakdown test. These machines had been working continuously day and night without a stop for over twelve months. They certainly looked as if they had seen some hard work. Nothing ever reminded me so much of the man who built a Ford car from parts picked up on the road, dropped by other Ford cars, and when he had finished made his car go faster, do more miles to the gallon, and last longer than a new one. Hence the moral: that if a piece of machinery is correctly designed and attended to by someone who thoroughly understands it, it will stand up to the work it is made to do.

These teleprinters under test are operated by a robot finger driven by an electric motor. There was no gentle, firm, and rhythmic touch about it but a good hefty 60 w.p.m. thump on the key as if it were deliberately trying to wear something out. This robot finger operates a different letter each day.

A Creed relay was also seen under breakdown test and showed no sign of fatigue after more than 12 months of A.C. from the mains.

These were all very illuminating performances. Finally, one is introduced to the demonstration room. Here are examples of everything from Murray multiplex to tape transmitters for column printing teleprinters. Some of the apparatus is fitted up as for station-to-station working, the premier exhibit being automatic Wheatstone, as represented by the cam-operated keyboard perforator and the Creed electro-magnetic reperforator (known in the P.O. as "airless Creed"). So Wheatstone in this form holds its own and is apparently still the leading telegraph system.

One point about the Creed Wheatstone system is worth mentioning, for although it has been tried experimentally in the C.T.O. it was never adopted as standard practice. The transmitter does not send signals direct to line but operates a transmitting relay utilising a dead beat moving coil milliammeter as a current indicator. In the event of a bias developing at the transmitter it can be corrected at the relay before the current is sent to line.

The column printing telegraphs were very much in evidence and do not appear to be under the condemnation attached in some quarters to column printing apparatus.

It was a difficult matter to find any inherent weakness in the teleprinter, though, of course, experiments are continually in progress aiming at the simplification of the more complicated mechanical operations.

One is inclined to form the opinion that these instruments are very much like motor cars. They are as foolproof as they can be made, but a certain amount of mechanical common-sense in the shape of correct adjustment and adequate and timely lubrication—the latter is a vital point—goes a long way towards ensuring freedom from faults and failures.

Though said in jest, the remark of a colleague "That a man ought to be employed on full time going round the C.T.O. oiling up," contains a certain amount of truth.

There is no doubt that the gruelling conditions of P.O. service will have a similar result to letting out on hire to drivers of varying knowledge and temperament, for use on any and every sort of road, a typical modern motor car: it is not going to give the same service as it will to the owner-driver mechanic.

If experience indicates that a further margin or factor of safety is required for heavily worked teleprinters there is no doubt the demand can be met by the resources of the Creed works.

Meanwhile, one feels that a booklet dealing more comprehensively with the mechanical relationship, margin of adjustment, dismantling and re-assembly of the various parts, would be a useful thing to have.

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One statistical detail may be of interest. The number of teleprinters manufactured in America during 1929 totalled 50,000, representing something over £5,000,000.

There is some indication that an output approaching this figure may be reached in our own country five years hence. There is not much doubt these instruments will replace many private telephones at present used for conducting the affairs of large business organisations.

HERALDRY IN FLAXMAN EXCHANGE.

MISS CLEMENT, supervisor in charge of Flaxman Exchange, in Mallord Street, Chelsea, has initiated an interesting movement which, through the medium of the medieval art of Heraldry connects the London Telephone Service with days of chivalry. Miss Clement has had the brilliant idea of composing, as a symbol of service, an heraldic device upon a shield, the main feature of which is the caduceus associated with the god Mercury, who, as the divinity presiding over communications, may be regarded as a suitable tutelary genius for a telephone exchange.

The ceremony of unveiling the shield was performed on Thursday, May 15, by the Deputy Controller, Mr. Pink, the District Superintendent, Mr. Buckeridge, presiding over the proceedings. Mr. Pink alluded to the artistic associations of the neighbourhood in which the exchange is situated, and gave an outline of the life of Flaxman after whom the exchange is named, although he himself had no connexion with Chelsea.

Major J. F. Nichols, M.C., M.A., brother of one of the supervisors at Flaxman, who is an authority on Heraldry, gave an explanation of the shield and its achievement, also of the very apt motto selected, *decus nostrum ministrando*, which he translated as, "Our pride is in serving."

Mr. Neate and Mr. Gray associated themselves, on behalf of the Engineering staff of the exchange, with the idea of the shield, and with the sentiments expressed in the motto and in the speeches that had been made, and a vote of thanks to the Deputy-Controller, moved by Mr. Benham and seconded by Miss Cox, concluded the proceedings, which were followed by a social evening.

This movement for reviving the sentiments and ideals of the days of chivalry is a most significant sign of the times, although, in the inevitable course of historical evolution, we have now reached the position when it is no longer the knights who go to the rescue of distressed damsels, but the damsels who come to the rescue of distressed subscribers. We heartily congratulate Miss Clement on the initiation of the idea.

H. G. C.

PROGRESS OF THE TELEPHONE SYSTEM.

THE following gives a brief review of the growth in the telephone system during the past financial year.

The total number of stations working in the Post Office system at Mar. 31, 1930, was 1,882,110, representing an increase of 127,469, or 7.3%, for the year. The increase of 127,469 stations is the highest on record, and exceeds that for the year 1928/29 (the previous best) by roughly 4,000. The exceptionally good result for the year 1929/30 is partly due to the accelerated growth in call offices in rural areas.

The growth for the year in London, England and Wales (excluding London), Scotland and Northern Ireland was as follows :—

	Total Number of Stations at Mar. 31.		*Increase.*	
	1929.	1930.	*No.*	%
London	626,714	675,783	49,069	7.8
England and Wales (excluding London)	948,934	1,016,869	67,935	7.2
Scotland	157,169	166,184	9,015	5.7
Northern Ireland	21,824	23,274	1,450	6.6
Total	1,754,641	1,882,110	127,469	7.3

Residence rate installations at Mar. 31, 1930, numbered 260,420 in the Provinces and 167,122 in London, the total of 427,542 representing an increase of 40,791, or 10.5%, for the year. The increase in business (subscribers) exchange installations for the same period was 24,294, or 3.8%. Throughout the country the proportion of residence to total subscribers continues to rise and at Mar. 31 last the percentage of residence subscribers was 48.9 for London, 34.8 for the Provinces and 39.2 for the country as a whole, compared with 30.5, 22.8 and 25.2 respectively at July 1, 1922, when the lower tariff for residence subscribers was introduced.

The total number of call offices (including kiosks) at Mar. 31, 1930, was 31,091, of which 6,016 were in the London telephone area and 25,075 in provincial districts. The net addition during the year was 5,227, or 20.2%, as compared with 1,810, or 7.5%, during the previous twelve months. The high rate of increase in the year 1929/30 was mainly due to the progress made under the scheme for the extension of telephone facilities in rural areas inaugurated as a result of the proposals contained in the 1929 Budget. The number of call offices in rural areas (included in the above figures) was 9,021 at Mar. 31 last, as compared with 5,877 at Mar. 31, 1929, and 5,371 at Mar. 31, 1928.

Of the net addition of 5,227 call offices for the year, 1,762 (33.7%) were kiosks. At Mar. 31 last kiosks in London numbered 1,709, and in the Provinces 6,331, giving a total of 8,040, which represents a 28% increase for the year.

During the twelve months ended Mar., 1930, 142 new exchanges were opened under the Rural Development Scheme of 1922, bringing the total number of exchanges opened since the inception of the scheme up to 1,409. In addition to the 1,409 exchanges opened, there were at Mar. 31 last a further 94 in course of construction.

The total number of exchanges working at Mar. 31, 1930, was 4,647, of which 1,496 serve urban districts and 3,151 rural districts. The number of exchange lines connected with the former was 1,066,911, and with the latter 128,590.

The number of rural party line stations working at Mar. 31, 1930, was 10,105, as compared with 10,456 a year previously. A number of such lines are being replaced by exclusive lines in connexion with the opening of rural automatic exchanges.

Largely as a result of the scheme for the extension of call office facilities in rural areas, considerable progress was made during the year 1929/30 in connecting rural railway stations with

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the telephone exchange system, and at Mar. 31, 1930, the number of stations connected was 1,631 as compared with 1,106 at the end of March, 1929, and 890 at the end of March, 1928. The increase of 525 (47%) for the year was comprised of 52 rented circuits and 473 call offices.

The number of effective calls originated during the year 1929/30 is estimated at 1,322 millions, or 56.5 millions (4.5%) more than the total for the year 1928/29.

At the time of going to press, the final results for the last two months of the year 1929/30 in respect of trunk calls were not available, and the year's figures will be given in a later issue. Particulars of the January traffic, which have not yet been quoted, are as follow :—

The total number of inland trunk calls dealt with was 9,621,796, representing an increase of 303,628, or 3.3%, over January, 1929. Outgoing international calls numbered 46,330, and incoming international calls 50,231, representing increases of 3,390 (7.9%) and 4,998 (11.0%) respectively over January, 1929.

Further progress was made during the month of April with the development of the local exchange system. New exchanges opened included the following :—

LONDON—Amhurst (Hackney), Fairfield (Croydon) (both automatic).

PROVINCES—Bexhill, Farnborough, Great Moor (Manual); Aylesford, Barming, Bearsted, Hunton, Loose, Maidstone, Otham, Wateringbury (automatic); Ballachulish, Clifford, Dunure, Glemsford, Little Gaddesden, Martin, Privett, Ridgewell, Rumford, Steele Road, Topcliffe, Wenvoe (rural automatic);

and among the more important exchanges extended were :—

PROVINCES—Eccles, Grimsby (automatic), Heckmondwike, Norton, Sidmouth, Taunton, Urmston, Walton-on-Thames.

During the month the following additions to the main underground system were completed and brought into use :—

Plymouth—Torquay,
Derby—Loughborough,

while 73 new overhead trunk circuits were completed, and 79 additional circuits were provided by means of spare wires in underground cables.

CIVIL SERVICE ARTS MAGAZINE.

WE notice in the May-July issue of this excellently produced journal, that the Poetry competition of February was won by Miss Eleanor McAllister, well known to our readers as Hon. Secretary of the London Telephonists Society. We have much pleasure in reproducing it :—

AN AFTERTHOUGHT.

You are gone: gone!

A little of your spirit must remain
To grace the place where once you gazed
On glancing firelight, glowing in the room
Dim with the shadow of departing day.

So do you stay!

And I more strength and comfort gain from that
Sweet afterglow, which spreads a golden web
Around the simple acts of daily life,
And lifts to glory all the common things.

ELEANOR MCALLISTER.

PUBLICATION OF TELEPHONE NUMBERS.

THE notes in the December issued under "Hic et Ubique," drawing attention to the omissions of advertisers in American publications and in the *Telegraph and Telephone Journal* to publish their telephone numbers, were interesting and provocative. Some evidence of a telephone should, of course, be an integral part of every address. It might be argued, however, by all telephone administrations that the publication of telephone numbers should be confined only to the current issues of their telephone directories. Progressive and rapidly developing telephone systems require the opening of new exchanges. Areas served by existing exchanges suddenly become congested, due to the removal of business from one area to another. Some areas have, in consequence, to be divided over two and sometimes more exchanges. Subscribers increase their installations and require large blocks of lines in lieu of one line only. They form large combines and suddenly centralise their interests and require them served by large installations at new addresses. Such changes make for telephone progress and are welcomed. They would, however, be more easily dealt with were it not for the changes in telephone numbers they necessitate and the opposition such changes produce. Subscribers generally state that their telephone numbers have been widely advertised and are one of their assets. They point out with truth that telephone numbers cannot be altered easily in the advertising matter they have already circulated. Unfortunately, also, they do not all correct advertisements in hand before issuing them and they are circulated giving incorrect telephone numbers.

The general publication of telephone numbers means that any changed number should not be re-allotted for a long period—generally about one year. Calls received for these numbers have to be referred by the exchanges affected to the new ones, causing irritation to the callers, delay in the completion of their calls, artificial restriction in the development of exchanges, wasted holding time on junction routes and much correspondence and clerical work, which could all be avoided if the current telephone directory was the only available reference for obtaining telephone numbers.

It was interesting to find that technical advertisers refrain mostly from publishing their telephone numbers, and one speculates as to whether they do so from their specialised knowledge of the conditions which prevail and from a desire to be helpful. On balance the omissions appear to be a matter for commendation and not reproof. If all advertisers referred readers to the current telephone directory for their telephone numbers, telephone administrations would undoubtedly be relieved of a frequent cause of complaint and difficulty. The enforced use of the telephone directory in all cases might be difficult for aged and poor-sighted persons, but this could be overcome, no doubt, by printing in a better type than that now used.

Should it ever occur that the general publication of the telephone numbers outside the telephone directory should be stopped, arrangements would have to be made by the responsible telephone administrations for new subscribers and those with changed numbers to publish their numbers until the first issue of the directory containing the information has been completed to the public. This might not be difficult to arrange if a special notice was sent in each case to the subscribers concerned, giving them dates when the publication of their telephone numbers outside the telephone directory should cease.

Whether it would be worth while for all telephone administrations to attempt to carry their public with them in this matter, is debatable, but from many points of view the question is one worthy of more consideration than it appears to have received in the past.

G. BUCKERIDGE.

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TELEGRAPHIC MEMORABILIA.

WIRELESS has found many outlets for its energy, but the latest, that of "oil-diviner," comes somewhat as a surprise, no doubt, to most of us. However, the Federal Radio Commission of the U.S.A. has allotted five short-wave frequencies specially for the purpose of oil exploration and the body just mentioned is sufficient guarantee. The method employed, it appears, by oil surveyors is to transmit a radio signal simultaneously with the detonation of a subterranean explosion of dynamite. By measuring the time lag between the reception of the radio signal and the sound it is possible, so it is stated, to determine whether oil exists in the territory between the transmitter and the receiver.

The gracious testimonial paid by the *Electrician* in its issue of May 9 last cannot be passed over without an expression of appreciation from a representative journal of the Telegraph Service: It was on the occasion of the opening of the Central Scotland grid, when in addition to the *daily* press there were also representatives of technical journalism eager for news of an epoch-making event; concerning the part played by the Telegraph Service, our contemporary writes:—

> "It is the fashion to throw stones at the telegraph service, and it is only fair to hand that much abused institution a bouquet when such an offering appears to be deserved. The last sheet of our telegram of about 1,200 words, giving the report of the proceedings at the opening of the Central Scotland grid, was delivered at our offices in Fleet Street about an hour and a quarter after the time at which the entire telegram was handed over the counter at Edinburgh. As the *Electrician* is not a daily, and there was heavy special traffic for the dailies to be handled, the telegraph service is entitled to credit for rising to the occasion in a very satisfactory way."

Companies.—The Anglo-American Telegraph Co., Ltd., report that in respect of 1929, rent from W. Union Telegraph Co. was £262,500: to this is added £65,625 brought forward. Four dividends totalling £3 15*s.* per cent. paid on Ordinary Stock. Balance, £65,625 carried forward.

Great Northern Telegraph Co., Ltd.: For 1929 directors propose to pay dividend of 20% including 5% already paid, to transfer £33,333 to Reserve and Renewal Fund and to allot £38,889 to pension fund.

Personal.—The late Mr. Walter Judd, formerly with the Eastern Extension Telegraph Co., left estate valued at £15,575 (net personalty £13,257).

Promotions.—It is not unlikely that could a vote be taken of the Telegraph Service, the promotion of the much esteemed author, Mr. T. E. Herbert, M.I.E.E., to the post of Superintending Engineer would prove the most popular, and no attempt will be made here to paint the lily! Too late for last issue, notification reached me of the promotion of Mr. E. L. Clair from Asst. Supt. to Superintendent Lower Grade, C.T.O. Though known in a smaller circle, here, too, the congratulations cannot but be sincerely unanimous regarding one whose capacity has been well proven.

The promotion of Miss E. Horsley to Supervisor Higher Grade and Miss F. L. Ockelford to Supervisor, both sequential to the retirement of the much respected Miss J. M. Rintoul, brings back to one's mind tactfully helpful service during the war and post-war period, when geniality was a priceless quality in dealing with frayed nerves and high pressure.

Round the World!—AUSTRALIA.—From the *Electrical Engineer of Australia and New Zealand* and other sources it is gathered that the federal works committee has recommended the establishment of a telephone service between the eastern states and Western Australia. The economical and modern proposal is to use the two existing 300 lb. copper *telegraph* lines for the provision of a voice-frequency telephone circuit, the telegraph traffic then being carried on high-frequency carrier channels upon the present physical lines, which will provide one voice-frequency telegraph channel, *eight duplex telegraph channels permitting of the simultaneous transmission of sixteen telegrams.* The optimistic telegraph report continues with the suggestion that "as the telegraph traffic increases" it will be possible to add two additional duplex telegraph channels without incurring further capital expenditure at any point between Adelaide and Perth. Provision is also made for increased telephone traffic by two additional telephone circuits "without any further expense other than for an additional wire on the existing poles." The capital cost of the scheme figures out at £69,800, and the estimated annual charges of the system £49,300. The estimated annual revenue is put down as £55,000, and of this the *telegraph service will contribute* £42,000, and the *telephone service* £13,000. The italics are the present writer's. CANADA.—Reuter's agency states that a radio-telegraph station, to be the largest on the Pacific Coast, with a range of five to eight thousand miles, and which will provide direct communication with all parts of the Pacific, will be constructed this summer on Lulu Island, south of Vancouver. The Director of Radio-telegraphy for the Department of Marine and Fisheries, Ottawa, is making final arrangements for the construction of the station, which will be in operation by the early autumn. CHINA.—By arrangement between the Chinese Ministry of Communications and the Chekiang Provincial Government, says *The Electrical Review*, work has been started on a long-distance telephone line between Shanghai and Hangchow, and is to follow the same route as that of the Telegraph Administration's circuits. For economical reasons the lines will be erected on the telegraph poles. It would be interesting to know the relative revenue results of the two services thus literally working side by side throughout this long route. FRANCE.—The initial aerial power of the new Brumath radio plant, near Strasburg, will be 12 kw., but it may be increased to 25 kw. later, says *The Electrical Review. World Radio* announces that the Toulouse station is to be moved 12 miles out of the town and that its power is to be raised to 60 kw. The short-wave wireless station on the Eiffel Tower, Paris, is to be used—if the change has not already been made—as the centre of a police radio service. Receiving stations will be established all over France and at boundary towns and seaports, and broadcasts will take place at intervals of an hour at a wavelength unknown to all except the police. From one point of view this statement would appear to have some confirmation, according to the *Wireless Trader*, which reports General Ferrié (chief of the French Military Wireless Services) as having said, in connexion with a scheme for the conversion of the Eiffel Tower into an ultra short-wave station for colonial purposes, that "if the tower under present conditions should prove unsuitable for ultra short-wave work, we will at once attempt to find a more suitable site, as it is absolutely essential that a great French station of this sort should be established. It is known that the present French Postmaster-General favours the scheme. GREAT BRITAIN.—On May 8, cable communication between the Shetland Islands and the mainland was interrupted. Telegrams were at first sent by post from Aberdeen, or from Kirkwall, but wireless apparatus enabled communication to be restored later. GERMANY.—*Combined picture-telegraphy, transatlantic telephony and ordinary trunk telephony.*—It is stated at some length in the German and other technical press that a contract has been placed with Siemens & Halske for the manufacture and laying of special cables for linking the transmitting station at Nauen and the receiving wireless station near Beelitz with the central operating station in Berlin. The specifications for the cable have been worked out by the German Versuchsamt, and the Telefunken, the Transradio, and the Siemens & Halske companies. The lengths of cable required are as follows: Berlin and Nauen 31 miles and Berlin and Beelitz 33. The inductive loading will differ considerably from that of ordinary telephone cables. The new cables are to be used for picture transmission and also for transatlantic telephone circuits. Carrier frequencies up to 18,000 cycles are to be employed on what will be known as the high-speed picture telegraphy circuits. Some of the circuits for 16,000 Hertz limit frequency are also intended for the trans-atlantic service, while lower speeds will be possible for slow picture telegraphy and still lower frequencies will provide facilities for

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official communications between engineers, operators, &c. It is reported that throughout the summer months the Berlin station is to broadcast daily from 6.45 to 8.15 a.m., in addition to its normal hours.—ICELAND.—Parliament has resolved to terminate as from January, 1932, says *The Times*, the contract with the Great Northern Telegraph Company for cable connexion between Iceland and the Shetland Islands. Wireless communication will be used in place and the above authority thinks it probable that the Government will accept an offer of the Marconi Company for telegraph and telephone services between Iceland and foreign countries for £20,500. The Director of Telegraphs anticipates that the new method will mean a great saving, besides giving more dependable communication, as cable interruptions are now very frequent. INDIA.—The report of the India Office Post and Telegraph Department for 1929 states that there are one hundred and sixty-five wireless stations in India, fixed, mobile, and experimental included. The Beam telegraph service between London and Bombay was considered to have given successful results. A steady increase of traffic, principally in the cheaper classes of telegrams, was noted and by the end of the year the average number of paid telegrams amounted to 70,000 per month. The telegraph and telephone mileage was increased by 2,016 miles of line, 14,000 miles of wire, 34 miles of cable, and 2,400 miles of cable conductors. New construction included 7,932 miles of wire for the various railways and 1,898 miles for irrigation service. The maintenance under the charge of the Department at the end of the year was altogether 102,000 miles of line carrying 467,000 miles of wire and 1,073 miles of cables containing 82,500 miles of conductors. Thirteen departmental telegraph offices, namely those at Kalbadevi, Amraoti, Jaipur, Dalhousie cantonment, Narayengani, Debrugarh, Tavoy, Toungoo, Taungyi, Allahabad cantonment, Fyzabad, Salem, and Hyderabad were converted into combined post and telegraph offices. It should perhaps be mentioned that at one time post and telegraph offices were completely separated, so much so that there were cases where one had to go to one part of the town to despatch a telegram and to quite another in order to obtain stamps to post a letter. Telegraph and postage stamps were quite distinct and could not be used for alternate services as was the case at one time in Great Britain. The scheme for the extension of telegraph facilities by authorising sub and branch offices and village postmen to accept inland ordinary telegrams from the public for transfer to the nearest telegraph offices for onward transmission had been found successful and is to be continued. One very interesting fact recorded of the wireless Beam service in India is that "Interruptions were of very brief duration and were mainly caused by disturbances on the *land lines* between Bombay *and* the wireless stations." It does not require a tropical climate to produce conditions such as those just quoted, for one has heard of similar results in northern climes! The principal improvements in land-line telegraphy which have been introduced by the Government during the last six or seven years have been in connexion with long-distance circuits employing high-speed printing systems. The installations of regenerative repeaters or retransmitters has rendered quadruple "up and down" working on the Baudot system possible over the longest circuits operated by the Department. ITALY.—According to a recently-issued report of the Italian Department of Posts and Telegraphs, there were 41,133 miles of telegraph lines, representing 326,149 miles of wire in Italy last year. JAMAICA.—It is understood, says *The Electrical Review*, that the Government has granted an English company a licence to erect a wireless broadcasting station at Kingston. It is to be erected shortly at a cost of £20,000. U.S.A.—It is announced that an additional 10,000 simplex telegraph typewriters (teleprinters) are to be installed this year by the Western Union Telegraph Company. The Postal Telegraph Company states that they have increased the number of typing telegraph installations on their system by 500%.

Meddlesomeness.—Meddlesomeness is the very opposite of helpfulness, for it consists in forcing yourself into another self, instead of opening yourself out to the other.—G. Macdonald.

J. J. T.

CORRESPONDENCE.

TO THE EDITOR OF "THE TELEGRAPH AND TELEPHONE JOURNAL."

SIR,—For the most honest borough in London I would give the palm to Chelsea.

This morning a police officer presented himself at the exchange door and handed in 4*d*. He explained that a caller in a call office had pressed button "B" in order to get 2*d*. back on an ineffective call, but a silver sixpence had come down the chute instead. The caller changed the sixpence, kept 2*d*., and took the remaining 4*d*. to the nearest policeman on point duty.

M. J. C. (Flaxman Exchange).

A PLEA FOR THE USE OF CORRECT TERMS AND EXPRESSIONS IN DEALING WITH TECHNICAL MATTERS.

TO THE EDITOR OF "THE TELEGRAPH AND TELEPHONE JOURNAL."

Probably most of your readers are aware of the ability of our cousins in the U.S.A. to coin words to suit the occasion, and of the remarkable aptness of many of those terms; but when it is a matter of recording technical subjects and of their conservation for the use of posterity, there is unquestionably a duty on everyone who has to deal with such matters, not only to use correct language, but also to use correct and understandable words and expressions.

Brevity is an admirable quality, much too often ignored nowadays, but there is no necessity to sacrifice correctness to obtain it.

The term "trouble shooter" for the official who has to clear faults, may be expressive, but its meaning is not clear to everyone, neither is it correct. Similarly the expression for a fault as a "bug" in the instrument or on the line, as the case may be, is neither correct nor suitable. Of course, one thing leads to another, and it may be that the term "trouble shooter" was the logical outcome of the description of a fault.

The word "phantom" is being used considerably in reference to certain types of telephone circuits, and there has been an occasional use of "ghost" for another type, which might involve the use of "sprite" or "sylph" for further developments in that particular direction. Now neither a phantom nor a ghost have any existence whatever, and their use is totally inaccurate and unsuitable. The use of either of these terms by a profession which is generally supposed to be one of the most modern and progressive is to my mind most regrettable, because there is no necessity to do so. The English language has ample accommodation to supply correct and understandable words and expressions without the need for adopting incorrect and unsuitable words just because they happen to be used on the other side of the Atlantic.

The word "superposed" is much to be preferred to "phantom" and is in every sense correct, while "double superposed" when used to indicate a circuit that is obtained by superposing on two other superposed circuits is quite understandable and is also correct.

If it is a case of brevity and conciseness, I can think of no better word than "plus," which is shorter than "phantom," and "double plus" for the double superposed circuit. The usual plus sign of "+," and "++" are very convenient too, both in writing and in labelling.

The Commission Electrotechnique Internationale does not use the available word "fantôme," but "circuit combiné."

Although the writer of this note is a great admirer of the progress and inventiveness of the Americans, there are some things they do which he considers not to be desirable and should not be adopted in this country, more particularly by a Government Department. If not, then we ought not to stop at half measures, but proceed to adopt his "bug," his "dooty" and his radio "toobs."

May 21. X.

[*Apropos* of "ghost," we have actually seen proposals set forth for styling a circuit superposed on two "phantoms" as a "ghost," and on two "ghosts" as a "spook" circuit.—ED., *T. & T.J.*]

MR. A. G. BRISTOW—NORTH-EASTERN DISTRICT.

ON April 25 we said good-bye to our Traffic Superintendent, Mr. A. G. Bristow, who left York to take up his appointment as District Manager of Bristol.

Mr. Bristow was presented with a very handsome electrical Jacobean standard lamp, and at a meeting of Exchange Supervisors and Traffic Officers was warmly congratulated on his promotion. He expressed regret in leaving a district where he had found such friendly relations between Exchange and Traffic staffs.

We all wish him the best of luck and hope that he will soon settle down in his new environment.

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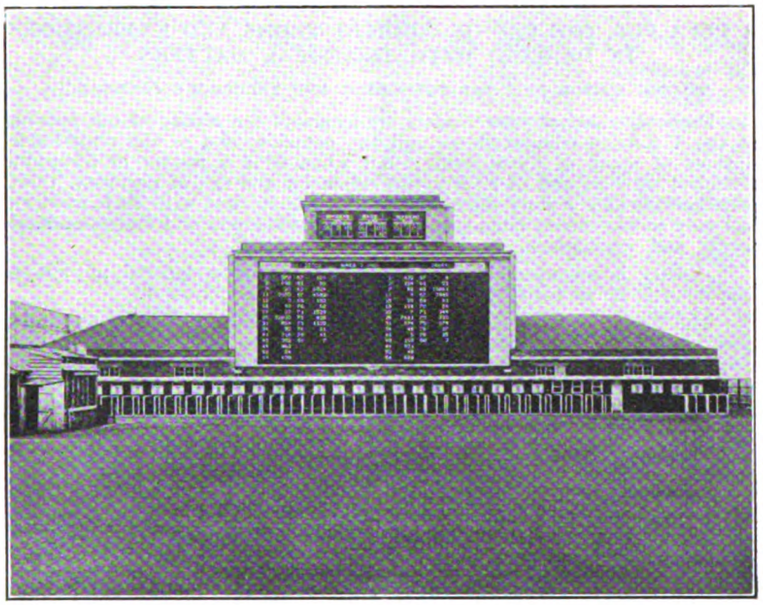
THE A.T.M. ALL-ELECTRIC TOTALISATOR AT THE ROWLEY MILE COURSE, NEWMARKET.

AT this season of the year some of our readers may be interested in the picture we publish of the all-electric totalisator installed by the Automatic Telephone Manufacturing Co., Ltd., of Liverpool, on the famous Rowley Mile Course at Newmarket. It is the first installation of its kind.

The Newmarket totalisator is designed for a total of 45 runners, the entire equipment, with the exception of certain ticket-issuing machines, located at other parts of the course, being housed in the building which constitutes the main indicator.



Its chief claim on the attention of a non-sporting publication like the *Journal* is that the electro-mechanism is identical with that comprising Strowger automatic telephone exchanges all over the world. It is made up into detachable component groups, mounted on pressed steel shelves carried by angle-iron frames.

Each of these component groups of Strowger switches and relays can be lifted from its shelf or replaced within a few seconds, and without disturbing the permanent wiring, a system of interlinked contacts resembling a double comb, one set fixed to the supporting rack, the other attached to the component group, ensuring perfect electrical continuity.

An important item of the equipment is the central control switchboard, from which the whole of the betting, including the issue of tickets at any point on the course and the horses running in each event can be controlled. Betting can be started, stopped, or modified as necessary, from this central switchboard, and, once the control switches have been set for betting in accordance with the agreed procedure on any given race, the control board is locked to prevent accidental operation of the control keys, or unauthorised interference whilst the race is in progress. This facility is one of several which effectually safeguards the racegoer against fraud.

GLASGOW TELEPHONE NOTES.

MISS MARION C. JAMIESON, the subject of our portrait, joined the service of the ex-National Telephone Company when the Message Rate System was introduced in Glasgow, and was one of the first Women Clerks employed in the District Office. The employment of women extended rapidly soon thereafter, and Miss Jamieson, at quite an early age, was promoted to be Head of the Section, with responsibility for the control of all the local and trunk call accounting. She now occupies the post of Higher Clerical Officer in the same office in which she commenced her telephone service. During her career, Miss Jamieson has seen the abolition of the Unlimited Rate, various changes in methods of recording and accounting, and the introduction of many mechanical devices for increasing the output of work. She takes a keen interest in all phases of the service, and is always ready with valuable suggestions for the improvement of the work. As far back as July, 1908, there appeared in the *Journal* an article from her pen on Sectional Balancing of Accounts at Glasgow, and it is interesting to note that this method has since been introduced generally as the standard practice under which telephone accounts are rendered. The writer of these notes, who, in 1908, was stationed in one of the southern districts, filed his copy of the article in his History of Telephone Accounting, and surprised Miss Jamieson by reminding her of it on his taking up duty in Glasgow three years ago.

MISS JAMIESON.

As a Supervising Officer, Miss Jamieson applies that rare principle enumerated by David Copperfield—"To do our duty to those whom we employ, than which there is no better way to get them to do their duty to us," and she fosters the spirit of encouragement of right methods, in preference to carrying on a campaign against wrong methods which, where indulged in, is out of proportion to the sum of the day's work.

Outside of her business activities, Miss Jamieson is interested in literature, is fond of music, and finds considerable pleasure in a garden.

"A Garden is a lovesome thing, God wot!
Rose plot,
Fringed pool
Ferned grot—
The veriest school
Of peace; and yet the fool
Contends that God is not—
Not God! in gardens! when the eve is cool?
Nay, but I have a sign:
'Tis very sure God walks in mine."

T. E. BROWN.

Princess Mary's Visit to Glasgow.—The Civil Service Sports Ground, Scotstoun, was the setting of an interesting and impressive spectacle on the afternoon of May 10, when Her Royal Highness Princess Mary, Countess Harewood, who is President of the Girl Guide Movement, took the salute at the Rally of the County of Glasgow Girl Guides.

Several members of the Exchange staffs are associated with the Girl Guide Movement and took an active part in the proceedings.

MISS M. K. SHEARER. MISS M. M. RUXTON.

The above photographs are of Miss M. K. Shearer, Assistant Supervisor, Class II, and Miss M. M. Ruxton, Telephonist, both of the Central Exchange. They had the distinction of being presented to Her Royal Highness, the former as a member of the Civil Service Sports Council, and the latter as District Commissioner of the North-Eastern Division of Girl Guides.

Our congratulations are due to both these ladies, and especially to Miss Ruxton, on her recent promotion from Staff Captain to District Commissioner.

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Glasgow Post Office War Entertainments Committee.—The past winter has seen no decrease of activity on the part of this Committee towards the welfare of our wounded soldiers. In all, nine entertainments have been provided for the patients at the Bellahouston, Ralston and Erskine Hospitals, and, in addition, a general outing to "Princess" Pantomime in February. We desire to place upon record our appreciation of the Committee for another successful season.

Mr. E. N. Payne, Assistant Traffic Superintendent, left Glasgow on April 30 to take up duty at Edinburgh on the following day. "Ernie" has the good wishes of all his late colleagues for a successful and happy career in the branch of his adoption.

In this as in most things he has once again shown that foresight for which he is deservedly credited.

A Day with Pepys.—Sunday: Sunday is the day to dine at someone else's expense.

Up right early and before I went out of my chamber did draw a musique scale, in order to my having it at any time ready in my hand to turn to for exercise, for I have a great mind when not at work to perfect myself in my scale, in order to my practising of composition. After breakfast did take an airing in the garden to my very great content. Then to church, where there preached little Dr. Duport. But though a great scholler, he made the most flat dead sermon, both for matter and delivery, that ever I heard, and very long beyond his hour, which made it worse. However, much against my will stayed out the whole church in pain, but I did entertain myself with my perspective glass by which I had the great pleasure of seeing and gazing at a great many fine women; and, what with that, and sleeping, I passed away the time till sermon was done. Thence to my Lord Rutherford's with some others, his officers and Scotch gentlemen, of fine discourse and education, did dine. Last Sunday did dine at home all alone, which I do not like on Sundays. Then to church again, where I did hear a young preacher, and he did exhort in terms beautifully devoid of eloquence—splendid with the deadly accusive monotony of truth. Back again to my Lord Rutherford's, where some Scotch people at supper. Pretty odd company; but there played one of their servants upon the viallin some Scotch tunes only; several, and the best of their country, as they seemed to esteem them by their praising and admiring them: but! the strangest ayre that ever I heard in my life, and all of one cast. But strange to hear my Lord Lauderdale (a Scot), say himself that he had rather hear a cat mew, than the best musique in the world; and the better the musique, the more sicke it makes him; and that of all the instruments, he hates the lute most, and next to that the bagpipe. Thence home and to prayers and to bed.

LEEDS DISTRICT NOTES.

Retirements, &c.

Miss Marion Rawcliffe, Assistant Supervisor, Class I, Huddersfield.—Evidence of the affectionate regard in which Miss Rawcliffe is held by the Huddersfield telephone staff was shown by the large gathering which assembled in the Dining Room at the Huddersfield Post Office on Monday evening, May 12, when a presentation to her was made by the Head Postmaster,

MISS RAWCLIFFE.

Mr. Austen, of a handsome standard lamp, given by the Supervisors and Telephonists of the District. A presentation of a service wagon from the Postal and Telegraph Supervising Officers was also made later.

Miss Rawcliffe entered the Post Office as a Sorting Clerk and Telegraphist at Burnley in 1885, and she soon became an expert telegraphist, being frequently called upon for duty for special events. On one occasion, when the American Ambassador was speaking at Burnley, advice was received of a column report too late to make special arrangements. Miss Rawcliffe keyed the report on a long-distance YQ circuit to all the principal cities of Great Britain from Aberdeen to Plymouth. She walked home at 3 a.m., after each station had signalled "Good night, old man." In 1907 she transferred to the telephones as Assistant Supervisor II at Burnley, becoming Assistant Supervisor I at Huddersfield in 1920. Clear-sighted capacity, shrewd observation and forthrightness were allied in Miss Rawcliffe with a sympathetic and charming personality. She leaves the Post Office after 45 years' service in good health, with the hearty good wishes of all her colleagues that she may spend many happy years of retirement in her new home at New Milton, in Hants, overlooking the Solent.

Mr. G. M. Burton.—Another officer to reach the allotted span of official life is Mr. G. M. Burton, Executive Engineer in charge of the Technical Section of the Superintending Engineer's Office. He commenced his service as a telegraphist at Hull Post Office in 1885, and 10 years later was transferred as a clerk to the P.O. Engineering Department at Cambridge. Three years later he was appointed Sub-Engineer in the then Bishop Auckland section, and in 1919 became Executive Engineer.

At an informal gathering in the Dining Hall of Telephone Building, a wireless set was presented to Mr. Burton as a token of esteem from the North-Eastern District staff generally, and he was also handed a brooch for Mrs. Burton. Mr. J. W. Atkinson (Superintending Engineer) and others testified to the regard in which Mr. Burton was held, and all present wished Mr. and Mrs. Burton the best of health and happiness during his period of retirement. The formal presentation was made by Mr. C. Wood (Inspector, Technical Section), after which Mr. Burton, in a few well-chosen words, thanked his colleagues for the gifts and good wishes.

Mr. H. J. Hewins.—On April 30 another member of the Superintending Engineer's staff—Mr. H. J. Hewins—retired on reaching the age limit. Mr. Hewins entered the Service at Birmingham in 1885 as telegraph learner. He was transferred to the Engineering Department as a clerk in 1900 and served in that capacity both at Birmingham and Preston. In 1913 he was promoted to a 2nd Class Clerkship at Leeds, becoming later a Higher Clerical Officer, which rank he held until his retirement.

At an informal gathering on April 30, in Telephone Building, Mr. Atkinson (Superintending Engineer), on behalf of the staff, presented Mr. Hewins with a clock and a case of pipes as a token of the esteem in which he was held, and, with other speakers, conveyed to him their best wishes for a happy period of retirement.

Miss W. Field, Assistant Supervisor, Class II.—One of the most popular members of the junior supervising staff at Leeds Exchange, Miss W. Field, left the Service on April 10 on the occasion of her marriage. She was the recipient of a handsome pewter tea-service from the exchange staff, and the many other gifts from individual members of the staff bore eloquent testimony to the friendships she had made.

Bradford Notes.

The close business relations between the Yorkshire woollen area and Australia made us anticipate that the new Australian service would be welcomed by Bradford subscribers, but it was pleasing to find that the first call from Bradford to Sydney was made on the day the Australian service was inaugurated. The call, which was from Mr. Robert Cook to his father-in-law, Sir Joseph Cook, a former High Commissioner for Australia, was in every way satisfactory, and received many favourable press comments throughout the district.

Our hats felt somewhat tight when we read the following in a recent edition of the *Yorkshire Evening Post*:—

> "There was a nice little compliment paid the other day in an assembly of business people to the women who work in Bradford Telephone Exchange. Said a visitor to the city, 'You have the quickest, most courteous, most intelligent, and most musical-voiced set of telephone operators I have heard in any provincial town.'"

It was with great regret that the Bradford telephone staff said good-bye to Miss M. Charnock, Assistant Supervisor, Class II, prior to her resignation on Mar. 31, on account of marriage. The numerous and costly presents which she received from the staff were real expressions of the affection in which she was held.

Golf.

On Friday, May 9, the Leeds Civil Service Golfing Society held their first annual competition at Sandmoor, when 92 competitors took part in a medal round over 18 holes, to decide which Department should be the first holders of the Championship Shield presented by Lt.-Col. T. P. Hobbins, C.B.E. The weather in the forenoon was not propitious, and the 40 competitors who were drawn to play before lunch completed their rounds in a downpour of rain, proving that if, as has been claimed, Civil Servants are the salt of

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the earth, their salt is not of a soluble character. Afternoon players had fine weather, but found difficulty in contending with a high wind.

The Shield was won by the P.O. Survey Department, N. E. District, with 4 net scores, aggregating 293. Other team results were as follows :—

Leeds H.P.O.	305
Inland Revenue	311
Ministry of Labour	311
P.O. Engineering Department	317
Ministry of Transport	317
Customs and Excise	319
Ministry of Pensions	336

The prize for the best gross score was carried off by Mr. H. A. Harrop, of the North-Eastern Survey Department, whose round of 82 was a fine performance in the rain. Mr. A. L. R. Cross (Ministry of Transport) and Mr. J. A. Schofield (Inland Revenue) tied for second place with 83; upon a play-off Mr. Cross won. The best net score of 69 was returned by Mr. J. N. Green (Leeds H.P.O.), Mr. J. Haig Smith (N.E. Survey Dept.) being runner-up with 70.

Supper and a musical evening at the Club House completed a highly enjoyable and successful day.

Football.

The Lancashire and Yorkshire Cup-tie re-play between Leeds H.P.O. and Doncaster P.O. was decided at Roundhay on Good Friday, and was witnessed by an unusually large number of P.O. people. In the first stages Doncaster, with the advantage of the wind, appeared dangerous, but in every case their finishing was weak and shooting erratic. Playing against the wind, Leeds largely concentrated on a defensive game, although several times the forwards broke away in rushes which ended in the Doncaster goalmouth. Half-time arrived with no score, but after the re-start Leeds soon showed their superiority, and Gaunt scored in the first few minutes. The Leeds half-backs kept the ball low and passed well, while at full-back Irons showed fine judgment and played a splendid game. A goal from Cass put the Leeds team further ahead and then goals followed in quick succession from Vickers (1), and Gaunt (3). Result: Leeds 6, Doncaster *nil*.

The semi-final against the Sheffield Engineers took place at Sheffield on May 3, and when time was called after a strenuous game the score was one goal each. Extra time was played and there was an orgy of penalties for "hands" against Leeds, which resulted in Sheffield Engineers running out winners by 4 goals to 1.

Cricket.

The following is the draw for the first round of the Cricket Competition for the Yorkshire Postal Cup, and promises some good matches :—

Pontefract and Castleford	*v.* York.
Doncaster	*v.* Leeds.
Bradford	*v.* Halifax.
Sheffield	*v.* Huddersfield.

LONDON TELEPHONE SERVICE NOTES.

Contract Branch Notes.

THE business done by the Contract Branch during the month of April resulted in a net gain of 3,382 stations as compared with 4,653 stations in the corresponding month last year. The gain in April shows a considerable improvement on the figure of 1,992 for March last, but the returns are unfavourable compared with the results for April, 1929.

The attenuated returns in the business quarters of the City suggest a possible explanation in, among other things, the many schemes of amalgamation, or rationalisation as it is more commonly called.

This modern industrial phase may prove to be a temporary barrier to the hitherto normal expansion of telephone development in this direction, as it is not unreasonable to suppose that the economic considerations underlying these schemes will affect telephone growth as well as other varied interests.

We can, however, look forward to reaping in full measure our share of the advantages claimed for rationalisation when the hoped-for results are being realised.

Underground Telephones.—We have reported from time to time how the telephone has penetrated new and strange places. Not long ago we fitted a number of kiosks in the subways of tube stations, and more recently kiosks were installed in the Rotherhithe and Blackwall Tunnels, under the River Thames. There is no limit to the "heights" as well as the "depths" to which the telephone aspires.

Reward for Good Work.—The Surrey County Council recently opened new offices at Kingston-on-Thames. Included in the invitations to the opening ceremony was one to the Contract Section, and it is interesting to record that this special privilege was extended to us, because we were regarded by the S.C.C. as one of 3 "Contractors" whose general work had most favourably impressed the Council.

Exhibitions.—We have received 21 enquiries for telephones from exhibitors at the forthcoming World's Poultry Congress, which is being held at the Crystal Palace in July this year. Exhibitors nowadays realise in increasing numbers the need to be on the 'phone, but a notable exception is the case of the many Dog Shows held throughout the year. This must be altered, even though some facetious critic may charge us with "going to the dogs."

By the Way.—In response to a request a Contract Officer called at an address in the West End prepared to interview the enquirer. He rang the bell several times and eventually the door was opened about 14 inches, at which a tired face with sleepy eyes appeared.

The following conversation took place :—

"What do you want?"
"I have called from the London Telephone Service, Sir."
"London Telephone Service?"
"Yes, Sir. You asked for a call to be made to-day."
"Well, what's to-day?"
"Tuesday, Sir."
"Good Lord! Have I been asleep since Saturday."

L.T.S. Sports Association.

Annual General Meeting.—The Annual General Meeting was held in the Cornwall House Refreshment Club at 5.45 p.m. on Monday, April 28. There was a very good attendance, and the Civil Service Sports Council was represented by Mr. A. E. Watson, C.B.E., Vice-Chairman of the Council, and Chairman of the Finance Committee. The chair was taken by Mr. Hugh Williams, who, after the minutes of the last general meeting had been read and confirmed, gave a brief résumé of the various sports sections during the past year.

He referred to the success of the Bowls Section in winning the Sir Henry Bunbury Cup, a much-coveted Civil Service trophy, to the efforts of the Hockey Section in organising clubs which resulted in the formation of 5 during the past year; also to the net-ball competitions for the "Liddiard" Shield, which were still in progress.

He announced that the Football Club had succeeded in reaching the top of the Second Division of the Civil Service League without losing a match. The Chairman expressed a hope that this time next year he would be in the position to announce a similar result in the First Division. The Cricket League Shield was won by the Traffic Club last season, and, now that it had been held by each club in the League except the Messengers, the competition during the coming season is sure to prove very keen. In referring to the Swimming Section, it was reported that there were now 33 Clubs with a membership of about 1,300. (Mr. Williams asked the members to note that through an error in transmitting the figures by telephone, the total would appear in the Civil Service Sports Handbook as 3,000.) The L.T.S. now held all Civil Service Ladies' Swimming records and there is every prospect that that high standard will be maintained.

The Lawn Tennis Section also reported a successful season. There were 21 team entries from the Exchange and Office Sections for the Agnes Cox Cup. The final was played at Regents Park and resulted in Clerkenwell, who were the original holders, regaining the cup. The Pink Cup, for singles, draw 28 competitors and the prize was won by Miss Wilson, Office Section, A.R.1, after a hard struggle with Miss Parker, Maryland. The entries for this year are 28 for the former and 77 for the latter. There only remains the Table Tennis Section to report on. Here again the interest is principally maintained by a tournament. There were 96 competitors in the past season's contest and the winners were: Ladies, Miss Gardner, Accounts Branch, A.R.7; and Gentlemen, Mr. George Lewis, also of the Accounts Branch, A.R.4.

The followed the election of officers, which resulted in the re-election of Mr. Hugh Williams, Chairman; Mr. George Lewis, General Secretary; and Mr. F. Meyer, Executive Secretary. A discussion took place as to the formation of an Athletic Section and it was unanimously agreed to call a special Meeting of those interested for this purpose, and also to arrange a Sports Competition during the summer.

The general business of the Association having been disposed of, the Chairman introduced Mr. Watson, who, in response to the cordial reception given to him, stated that he was gratified to find so many members interested in the business part of the Association and added that such a well organised body of enthusiasts was sure of success. He proceeded to relate how the sums contributed to the Council were disposed of and expressed a hope that it would not be long before each district of London was provided with its own sports ground. He referred to the facilities available at Chiswick, both for sport and refreshment, and concluded by inviting questions from any member who sought information. Several items of general interest were discussed and the meeting concluded with a vote of thanks to Mr. Watson proposed by the Executive Secretary, Mr. Meyer.

A social followed, when several of the staff performed.

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Bowls Section.—The first trial of strength in the London Area Bowls League took place on Thursday, May 1, when the L.T.S. opened the season with a match against a strong Headquarters team, who are one of the promoted clubs from the B Division. The result was a win for the L.T.S. by 7 shots, 2 rinks winning by a margin of 8 and 3 respectively, the third being down by 4 shots.

Messrs. Cleland & Heard have been selected as Skip and No. 3 respectively, to represent the London Civil Service in the Southern Counties Single rink championship.

Cricket Section (Contracts).—The Annual General Meeting was held in Cornwall House on Monday, April 28, 1930.

Mr. Culley, the Secretary, presented the annual report and balance sheet which showed a balance in hand of £5 5*s.* 10*d.* The programme for the forthcoming season was discussed, and it was decided to purchase additional tackle, involving considerable expenditure. The meeting decided to defer the election of Captain to the players at a meeting to be held when the first practice game is played. It is hoped that the Section will be able to find some new players from the recent additions to the Contract force.

The meeting expressed their appreciation of the continued good work of the Secretary, Mr. Culley.

Wimbledon Exchange.

On Saturday, May 3, H.R.H. Princess Mary, Countess of Harewood, laid the Foundation Stone of the new wing to the Nelson Hospital, Merton, and the Wimbledon telephonists were proud to be among the many contributors to the cause.

Miss M. P. Trett, a 36-hour telephonist, had the honour to be chosen by her colleagues to present to Her Royal Highness a purse containing £5, and the staff will look upon the occasion as a red letter day for all time.

Night Staff.

The London Night Telephonists Branches of the U.P.W. held their Annual Luncheon on April 28. Mr. R. R. Young was, as usual, the presiding genius. A most enjoyable function, which we hope will be continued.

Personalia.

Resignations on account of Marriage.

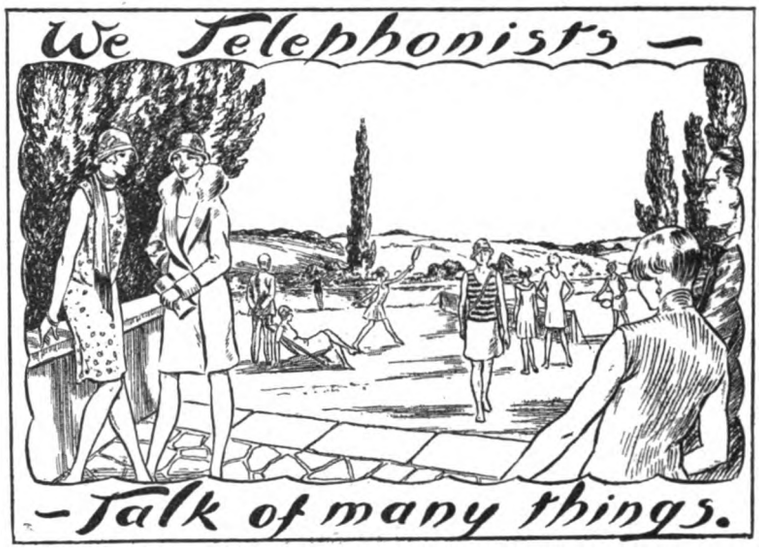
Telephonists.

Miss E. J. Villinger, of Museum.	Miss W. A. Hayter, of Gerrard.
„ R. L. Dilley, of Battersea.	„ M. G. Goater, of Gerrard.
„ V. S. Hitchman, of Battersea.	„ D. S. R. Portsmouth, of Park.
„ C. P. Bywater, of Bermondsey.	„ C. E. Charlton, of Lee Green.
„ F. Redrup, of Richmond.	„ A. F. Short, of Grangewood.
„ K. M. Bishop, of London Wall.	„ M. Norman, of Holborn
„ M. W. Walker, of London Wall.	„ F. Jepps, of Victoria.
„ N. M. Williams, of London Wall.	„ C. E. Isaacs, of Victoria.
„ B. Hunt, of Kensington.	„ E. A. Tracey, of Trunks.
„ K. S. Lawrence, of Western.	„ G. M. Knight, of Trunks.
„ I. Wilson, of Willesden.	„ R. J. Simpson, of Trunks.
„ D. V. Tilling, of North.	„ D. M. A. Bird, of Trunks.
„ E. M. Sturt, of Tandem.	„ D. M. Bentley, of Trunks.
„ G. D. Graddon, of Ealing.	„ E. V. Nice, of City.
„ E. M. R. Newell, of Bishopsgate.	„ M. F. Sleight, of Purley.
„ A. E. Wallace, of Hop.	„ R. M. Billings, of Maryland.
„ J. M. Austin, of Gerrard.	„ A. M. Abel, of Streatham.

FOR OUR ADVERTISERS, &c., &c.

Australia, Melbourne, P.M.G.'s Dept. June 17. Supply of loading coil pots (Ref. B.X. 6350). Also, same date and dept., supply of multiple twin cable (Ref. B.X. 6349). Also, same date and dept., Indicators (Ref. B.X. 6333). *New Zealand*, Wellington, Posts and Telegraphs. June 25. Supply of condensers (P. & T. 151/2240) (Ref. B.X. 6308). Also, same date and department, 100,000 3½-in. lead clips, 30,000 2½-in. ditto, &c. (Ref. B.X. 6375). *Australia*, Melbourne. July 8. Supply of telephonists' telephones (Ref. B.X. 6352). Also, same date and department, telephone generators (Ref. B.X. 6376).

The monthly journal of the British Chamber of Commerce in Argentina directs the urgent attention of British wireless manufacturers to a decree recently issued governing the operation of broadcasting services, &c., which is more than likely to make a big demand in the near future for "high-class complete wireless sets." The journal urges that the effects of the decree should be watched by British makers of the type of set above mentioned whose apparatus would be suitable for the trade which hitherto has been held in check by the defects of the services. J. J. T.



The Seven Deadly Sins.

JUST above my desk hangs a pipe-rack. There are no pipes in it. It is too good for even such excellent and comforting friends as pipes. It is a work of art. It consists of a row of seven heads—monks' heads, to judge by the cowls—and in each head, in the place where the tonsure would be, is a shallow hole for ash. The faces are wickedly ugly and are stated to represent the Seven Deadly Sins. I should think it probable that they do. The rack came from Paris, from whence, it is popularly supposed, most sins, deadly and otherwise, are imported duty-free. Which face represents which sin I cannot say. What indeed are the deadly sins and are there as many as (or only) seven? You don't know I'm sure, and although supervisors know everything, I should hate to be so catty as to suggest that even chief supervisors knew. Such enquiries as I have made of sundry sources—made ever so discreetly and with infinite tact—have only met with a prim Victorian reticence, pursed lips and a knowledgeable shake of the head. However, it doesn't really matter—although one feels that one *would* like to know how far one had yet to go before one was quite a positive rascal. I wonder if—but hush, here comes the Editress.

As I was saying, this pipe-rack has given rise to a division of family opinion. With a bluntness of expression which goes by the name of plain truth, one sister avers that, of the seven faces, that on the extreme left bears a remarkable resemblance to me. Camou, with a loyalty to me which is really quite touching, disagrees, but adds as her profound conviction that the face on the extreme left was undoubtedly copied from that worn by my sister's husband. (He, of course, is my brother-in-law—it's as well that you should be clear in the matter.) I interpose the remark—with the best of intentions, I can assure you—that anyway, he didn't look like that before he married. Have you ever been pierced with a withering glare or withered with a piercing glare, which intensifies a thousandfold when you gasp, "Oh, what *have* I said!"? I have. I felt like a day-old lettuce—all flimp and matty. The other sister, with a Solomonic impartiality, says that so far as she can see, each of her male relatives is a composite reproduction of the whole seven. Fortunately, she is small and can be dealt with suitably at a convenient season.

I would not have you suppose, however, that the whole family is torn by dissension. Not at all! My "in-law" and I are unanimous in the opinions that neither of us can be considered as being in any way like any of the seven faces and that our respective wives showed a rare perfection of taste and appreciation of quality when they chose us out of the heap.

PERCY FLAGE.

Exchange Names.

"Lives of great men all remind us, we can make our lives sublime." Evidently the "power of example" prompted the choice of such exchange names as "Livingstone," "Gladstone," "Tudor," "Waterloo," and others.

The Livingstone Exchange can be reached by taking a stroll through the leafy paths of Grange Park. It stands on top of a hill commanding a view of several counties and is opposite the fine old church of "All Saints." In the stately homes surrounding it dwell those select, exclusive people to whom "Every prospect pleases"—but the "L.T.S." is vile.

Perhaps a Stanley will be sent next September to relieve, assist, explore, and write his memoirs on "How I found Livingstone."

What did Gladstone say in '84? He is supposed to have said: "When one has one, one wants one little one more." But I do not credit him with that observation—his was not a frivolous nature!

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One can imagine those stormy days when the Irish Members of Parliament under the leadership of Parnell pursued their obstructionist policy to such an extent that Gladstone might well have addressed the House of Commons in these terms: "In 50 years' time, my friends, England will be in the throes of automatic telephony—let Ireland have Home Rule!"

"Chancery," is so named because it is rumoured that the Editress may, at some future date, write a telephone play with a Ward in Chancery as the heroine.

The fall of Napoleon was due to the victory of the English at the battle of Waterloo and the phrase "He met his Waterloo" comes from this source.

The Waterloo Exchange is accommodated in the same building as "Hop," which would appear to mean that "Hop" has met its "Waterloo."

"Tudor" is named after King Henry VIII, presumably because he possessed "personality." Portraits of him suggest that he was no lover of slimming diets and he was an adept in the art of disposing of unwanted wives. Ye who have charge of the exchange which bears his name, do not, I pray you, admit a Henry into your Tudor!

Does "Fairfield" lie in green pastures where young lambs gambol in the glorious rays of the summer sun? No! it is situated in the heart of a densely populated London suburb and is near the Croydon Town Hall, where the police court strikes terror into guilty souls. A grand piece of architecture known as the "Croydon Almshouses" is situated in the narrow and most frequented part of the main road, a danger to pedestrians and motorists alike. Over 25 years ago members of the Croydon Council talked of having the almshouses removed—they are still talking! The exchange is a short distance from the parish church, with its wonderful peal of bells; it is proposed to make this church a cathedral when Croydon becomes a city. Oh, "Fairfield"! your subscribers need never complain to the Controller, they have but to consign you to the police court, the almshouses, or the tolling of the bell!

The "Empire," "National" and "Metropolitan" Exchanges will eventually be housed together; they derive their names from the fact that the Union Jack may possibly be hoisted over the Wood Street building at the request of satisfied subscribers.

Within the next few years "Wordsworth," "Byron," and "Macaulay" will be opened and it is anticipated that many other English poets and authors will be commemorated by an automatic exchange.

G. M. T.

Contributions to this column should be addressed: The Editress, "Talk of Many Things," *Telegraph and Telephone Journal*, Secretary's Office, G.P.O. (North), London, E.C.1.

LIVERPOOL NOTES.

It is always a pleasure to announce promotions, and Liverpool just now is able to offer congratulations to several members of its telephone staff.

Miss E. E. Walker has been promoted from Writing Assistant to a Clerical Officer's position at Colchester. Her popularity with her colleagues was exemplified in tangible form by several tasteful and useful presents.

Mr. A. Duxbury and Mr. J. Harding have also satisfied the promotion board that they are worthy of better things and have been promoted from Clerical Officers to Higher Clerical rank at York and Southampton respectively.

In search of a milder and sunnier climate, Miss Hill, a Clerical Officer from the District Office has at her own request been transferred to Guildford.

A popular and well-known figure in Liverpool, Miss C. Williams, the Travelling Supervisor, has left the Service of the State to enter into one no less important—that of matrimony. Her departure was marked by many tokens of the deep regard of all sections of the staff, and we all wish her every happiness and success equal in married life to that she attained in official life.

Her successor is Miss Kermeen, late of Bootle and Trunks, to whom we wish the same success (in her official capacity, of course) as Miss Williams.

A subscriber, describing his experience of the Chilian Service on a call from Santiago to Liverpool, says:—

> "I should like to congratulate you, and the telephone engineers, on this wonderful achievement. The transmission was perfect—we heard everything as clearly as a Liverpool-London call. I was advised that the call would come through about 6.30 p.m., and practically to the minute I was talking to my son all those thousands of miles away."

Although the Australian service has not been opened very long, there are not wanting signs that it will be found of much value to Liverpool.

An interesting departmental golf match took place at Bidston on May 13, the Post Office gaining a victory over the Ministry of Labour after some very strenuous but enjoyable contests.

C.T.O. NOTES.

Promotions.—Mr. E. L. Clair, Asst. Superintendent to Superintendent (Lower Grade), Mr. W. R. Francis, Overseer to Asst. Superintendent, Mr. S. H. Courtnell, Telegraphist to Overseer.

Miss E. Horsley, Supervisor to Supervisor (Higher Grade).

Miss F. L. Ockeford, Assistant Supervisor to Supervisor.

Miss A. L. M. Rolt, Telegraphist to Assistant Supervisor.

Retirements.—Messrs. H. Potter, Overseer, A. H. Colvin, Telegraphist, and Miss M. A. Holloway, Telegraphist.

Cable Room.—At a most successful Cable Room Smoking Concert, under the chairmanship of Mr. J. G. King, opportunity was taken to wish Messrs. A. Bing, A. Jay, and G. Matthews, on behalf of the whole of the Cable Room Staff, good health, long life, and happiness in their retirement. In each case the sentiments of goodwill were accompanied by a cheque.

Reunion Dinner.—The Threadneedle Street B.O. and Stock Exchange Reunion Dinner was held once more at the London Tavern, Fenchurch Street, where about 100 past and present members of the Staff sat down and enjoyed a splendid meal. The chair was taken by the Controller (Mr. J. Stuart Jones), who, during the course of the evening proposed the toast of "The Staff." Mr. W. C. Hooper ably responded. "The health of the Chairman" was moved in felicitous terms by Mr. Corner and Mr. Stuart Jones suitably replied. The enjoyment of the evening was added to by a delightful concert in which Miss V. Lemaire and Messrs. D. Knowles, F. Hudson, Parr, and Jennings, with Mr. A. White at the piano, gave of their best.

Sport.—The seventh season of the Centels Chess Club closed in mid-April.

For the seven seasons the Club has maintained the record of never losing a game by default. Such a record has been praised in one of London's leading evening newspapers, and this record has gone so far afield as being noticed in the *Brooklyn Eagle* of the United States.

The first team, by half a point, finished second to the Admiralty II in the Civil Service League, Division III. They also finished second in the London League "C."

Football.—The annual fixture for the Aldwych Cup—Centels *v.* Barts Hospital—was played at Chiswick and, after being the losing side for five consecutive years, Barts won the cup by one goal to *nil*. The Barts' fund was helped considerably by the sale of tickets.

Billiards.—The final of the C.T.O. Billiards Handicap resulted in a win for A. W. Edwards who, with 200, beat W. Smith (Cable Room) who scored 121.

WESTERN DISTRICT NOTES.

ON a Saturday morning during last summer (1929), at 10 a.m., Mr. H. W. Francis, Head Postmaster, Falmouth, received a personal call from London. He was told that a gentleman in New York was on the telephone and wished to speak to his brother, who was *staying somewhere on the front* at Falmouth. They could only furnish his name. After doing a bit of quick thinking Mr. Francis, with the assistance of the Inspector of Postmen and a Postman ascertained that the gentleman required was staying at a boarding house called "Holmlea." Enquiry was made at the boarding house, but the gentleman happened to be out. A message was left with the manageress to ask him, directly he returned, to get on to the telephone exchange, when he would be put into communication with his brother in New York, who was waiting to speak to him. Fortunately the gentleman required returned quickly, and within 25 minutes from the time that the Head Postmaster received the call from London the two brothers were speaking to each other.

Subsequent enquiry of the Controlling Telephonist in London elicited the fact that the conversation was perfect.

Presentation at Exeter.—Mr. Thomas Houseman, who has held the position of Staff Officer in the Western District Surveyor's Department, G.P.O., Exeter, for the past 10 years, retired from the Service on April 7, and as a mark of the esteem in which he was held by his colleagues he was presented with a very handsome oak monk's bench and a "Buoyant" wing armchair. The bench bore a tablet suitably inscribed.

The presentation was made by A. O. Spafford, Esq., O.B.E., Surveyor of the Western District, in the Palm Court of the Imperial Hotel, Exeter.

Mr. Houseman will long be remembered for his kindness of heart and sympathy, especially for those who experienced illness or bereavement.

F. I. FROST, Traffic Supt.

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THE

Telegraph and Telephone Journal.

VOL. XVI. JULY, 1930. No. 184.

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All correspondence relating to advertisements should be addressed to MESSRS. SELLS, LTD., 168, *Fleet Street, London, E.C.*4.

TELEGRAPH AND TELEPHONE MEN AND WOMEN.

LXXVI.

MR. A. B. HART.

MR. HART, Staff Engineer, of the Engineer-in-Chief's Office, is in charge of the Lines Section, dealing with the provision of submarine and underground cables as well as with aerial lines for both telegraph and telephone services. In the latter case is included the telephone repeater stations situated at suitable intervals on all the main telephone routes. He was born on Dec. 2, 1874, entered the P.O. service at Cambridge in June, 1893, and was transferred to the Engineering Department in 1896. His experience is a varied one, embracing clerical as well as engineering duties in various parts of the country.

He is a member of the "Comité Consultatif International des Communications Téléphoniques à Grande Distance," and in that capacity he shares the credit with the other members of that important body for the remarkable extension of telephony between this country and the Continent during the last few years.

Having been born in the country his hobbies, quite naturally, are influenced by his early associations. He has a small farm, is a golfer and an expert motorist, having taken up that entertaining recreation in the very early days of its development when it was essential that a motorist should also be an expert mechanic and a lover of mechanism, which Mr. Hart has been during the whole of his service with the P.O.

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The
Telegraph and Telephone Journal.

PUBLISHED MONTHLY IN THE INTERESTS OF THE TELEGRAPH AND TELEPHONE SERVICE, UNDER THE PATRONAGE OF THE POSTMASTER-GENERAL.

Editing and Organising Committee - - - Lieut.-Col. A. A. JAYNE. J. STUART JONES. W. D. SHARP. W. H. U. NAPIER. J. W. WISSENDEN.

Managing Editor - - W. H. GUNSTON.

NOTICES.

As the object of the JOURNAL is the interchange of information on all subjects affecting the Telegraph and Telephone Service, the Managing Editor will be glad to consider contributions, and all communications together with photographs, diagrams, or other illustrations, should be addressed to him at the G.P.O. North, London, E.C.1. The Managing Editor will not be responsible for any manuscripts which he finds himself unable to use, but he will take the utmost care to return such manuscripts as promptly as possible. Photographs illustrating accepted articles will be returned if desired.

VOL. XVI. JULY, 1930. No. 184.

TELEPHONE HATRED.

MR. BALDWIN recently confessed that he abominates telephones. We are told that the late Lord Oxford disliked them so much that he never used one. We can, therefore, make no political capital out of these confessions, since leaders of both the older parties have made them. They may argue a conservative habit of thought, but then the vast majority of us, unless we are self-deceivers, are conservative in our attitude to new ideas. At the best, we suspend judgment. At the worst, we are obscurantists determined to see no good in what our fathers did not enjoy before us. Some few have the gift of truly discerning at once the significance of a new invention, or of a new development in art, and can recognise in them the dawn of a new era.

Telephone hatred, the *Evening Standard* aptly comments, is an infirmity of many noble minds. But we feel emboldened to say that it is not the telephone which noble minds detest; it is the annoyance to which they are often subjected through this channel. Public men are often unwarrantably disturbed at their work (or leisure) by telephonic "gate-crashers," but the blame should be laid at the door of those pushing and pertinacious members of society whose actions are not circumscribed by ordinary considerations of courtesy, rather than at that of the telephone itself. Even politicians, we think, cannot really abominate an invention which brings them in direct and immediate touch with those to whom it is their pleasure or their necessity to speak, even though separated from them by hundreds or thousands of miles.

The achievements placed at our disposal by science differ in one notable respect from the works of artists and authors. We may ignore, and even love, the weaknesses and defects of the latter, as we look with indulgence on the foibles of dear friends: we never love the defects or drawbacks of a machine, or the service in which it is employed. We may admire the railway, yet never be reconciled to the missed connexion or the hopelessly late train. We may be wireless enthusiasts, but never regard "fading effects" with affection.

Hence, however much we appreciate the telephone, we like it less when the unwarranted correspondent fritters away our time, and look with no indulgence on the infrequent but none the less unwelcome "cut-off." Others there are, of course, who dislike railway travelling in itself but admit its immense convenience: who have good physical reasons to abominate steamships and yet own that they are admirable and efficient means of communication. To put it shortly, it must be recognised that useful inventions do not, however disquieting this may seem from the ethical point of view, depend on love or admiration for their success. You may abominate them and yet find them indispensable. A more reasonable attitude is one of gratitude for their benefits, and a kindly tolerance of any inconveniences which follow in their train.

HIC ET UBIQUE.

THE expansion of the Anglo-Continental Telephone Service, which at one time seemed to be following the route of the Orient express, has now followed and pushed beyond the itinerary of the Nord express. As our readers know, service was lately opened to Lithuania. Last month, service between London and Tallinn (Reval) in Esthonia was opened on the 2nd, and between all places in Great Britain and all places in Latvia on the 5th. The charge for a 3-minutes' day call between London and Riga is 17*s.* 6*d.* between London and Reval 22*s.* 3*d.*

The Anglo-Australian radio telephone service was extended to Adelaide and other places in South Australia on the 19th ult., and now embraces the four great cities of Australia, viz., Sydney, Melbourne, Adelaide, and Brisbane. The charge for a 3-minutes' call is £6.

A special number of our contemporary *Tijdschrift voor Posterijen-Telegrafie-Telefonie* celebrates the twenty-fifth year of the existence of the Union of Higher Officials of the Dutch P.T.T. It contains retrospective and commemorative articles and a record of the chief officials of the Union since 1905. Besides a group of the Administrators it also contains excellent portraits of MM. Zeilmaker, Renier, Pronk, Fijn van Draat, Meijer, van Poppel, Verpalen, Wesselink, and Kuyper.

The following incident, reported by our correspondent, shows that the life of a contract officer is not without variety and excitement:—

On making a call on the 4th floor of a large block of flats my knock was answered by an elderly maid, who became much annoyed when her mistress's pet dog bolted down the stairs whilst she was conversing with me.

On hearing of the possible wrath of her mistress, if Fido was lost, I joined the maid in a rush down the stairs to recapture the dog. In response to our shouts a butcher's boy eventually succeeded in capturing him.

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The worst was yet to come. The front door had slammed, leaving the lady's lunch (sausages) still frying on the gas-stove. The maid was without a key, and the only means of entry was at the rear, which involved climbing the fire staircase, which she did not relish. Considering the position was brought about by my call, I offered to effect the entry. On doing so I discerned the smell of fried sausages in the scullery and turned the gas out before opening the front door for the maid (and Fido), who was much relieved to hear me say: "The sausages are O.K., and not burnt."

ACCORDING to the report of the Department of Overseas Trade, the growth of the telephone system in New Zealand proceeds rapidly, and on Mar. 31, 1929, the number of stations was 152,541 (or 103.72 per 1,000 of population), as compared with 144,552 a year previously. A recent development in New Zealand is the adoption of the system known as "carrier-current" telephony, which not only increases the carrying capacity of the circuit, but adds tremendously to the ease of long-distance communication. The area now covered by inter-island telephone services has been extended, and considerable developments are taking place in the installation of automatic telephone exchanges. On Mar. 31, 1929 42% of the telephones in use were automatic or dial. Dunedin was cut-over to automatic in May, 1927, and Christchurch, the last of the four main centres to be entirely equipped with automatic exchanges, was cut-over on Sept. 14, 1929. In addition, ten of the leading secondary centres are so provided, whilst Whangarei, Marton, and Gisborne will shortly be equipped. The first all-British automatic exchange was cut into service at Hawera in January 1927, whilst two other all-British have since been installed at Dannevirke and Stratford.

The *Daily Mirror* inserts the following letter under the heading "The useless telephone." We venture to think a column entitled "Plaints of the Peevish" would be useful for such correspondents.

A telephone is to me the most irritating, and almost the most useless of modern inventions.

I am rarely able to get a number. When I do get it the people I want to talk to are out. Few of one's friends are ever in, in these days of restless agitation. STAY AT HOME.

The moral seems to be that in these days of restless agitation the irritated gentleman's friends ought to stay at home when he is likely to ring them up, or at least when they are at home, they should arrange not to be using the telephone when he wants to speak to them.

According to the *Exchange Telegraph* the Roumanian Government are understood to have granted a twenty years' licence to the International Telegraph and Telephone Corporation for the development of the Roumanian telephone service.

All dial telephones, says Reuter, have been ordered to be removed from the Senate wing of the Capitol by a special resolution of the Senate, members of which have complained that automatic 'phones are a "nuisance."

The *Chicago Tribune* makes the following caustic comments:—

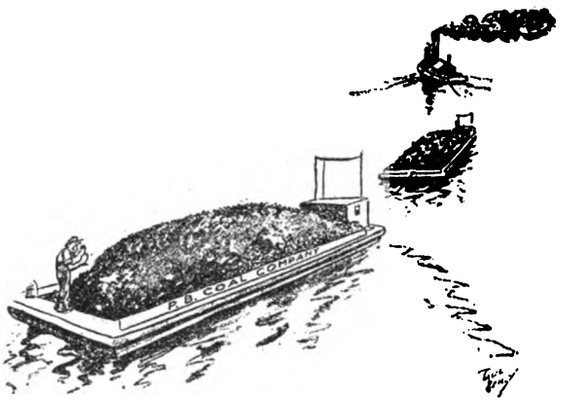
"As the dial telephone mechanism is familiar to us here, it is required of the citizen using it that he know his letters and his numbers. With that literacy, he can take off the first three letters in the name of a telephone exchange.

"He is also required to know the exchange and the number with which he wishes a connexion. Then he is called upon to insert his finger or a pencil, a fountain-pen, gold toothpick, knife point, scissors blade or any other small, suitable instrument—a drill if he is a dentist, the handle of a paint-brush if he is an artist, or a corkscrew if he is a congressman—and whirl the dial around.

"The Conscript Fathers in the Senate at Washington are ordering the blank dials out because Senator Carter Glass of Virginia can't work the abominable things, nor can the other Fathers. . . . It will probably be all for the best."

Three thousand telephones, says *The Electrical Review*, a record number for any single European building, will be installed in Thames House, Westminster, London, on its completion in 1931. The previous record in this country was held by Imperial Chemical House, which had 2,000. In view of the size of the building, which contains three miles of corridors, is of eleven stories, and has 770,000 sq. ft. of floor space, it is proposed to equip Thames House with public call boxes and a system of private intercommunication telephones.

According to a study made by W. P. Banning, Asst. Vice-President of the American T. and T. Co., in the *Bell Telephone Quarterly*, in an analysis of telephone conversations, computes that out of 80,000,000 conversations 50 words account for 60% of the total words used and 700 words account for 75% of the total words used. In 500 conversations in which about 80,000 words were used, only 2,200 were different, or 3%.



The picture here reproduced from *Life* (New York) reached us via the Brazilian journal *Sino Azul* (Blue Bell). We take the Portuguese version of the joke to read:—

"RADIO-TELEPHONY.

"No, Sir! You're on the wrong line. This boat is *not* the *Leviathan*."

RETIREMENT OF MR. D. M. FORD.

MR. D. M. FORD, Deputy Controller of the Central Telegraph Office, who retired on June 20 last after nearly 45 years' service in that Department, was presented by his colleagues at a farewell gathering with a "Grandmother" clock as a token of the high esteem and affection with which they regarded him. The Controller (Mr. Stuart Jones), in asking Mr. Ford to accept the gift, said that Mr. Ford was leaving the service in the best of all frames of mind. He was neither eager to go nor reluctant to leave. He had kept his interest in his work and his energy in doing it up to the very last day of his service and that was characteristic of him. Behind the competent official and the admirable colleague, there was a very kindly and lovable man, and they parted with him with the utmost reluctance. They wished him every happiness in the fresh adventure which life would now offer him. Mr. Ford, in replying, said that he had spent a happy life in the Central Telegraph Office and that he greatly appreciated the gift of the beautiful clock, which would remind him, if a reminder was necessary, of the friends he left behind.

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PEREGRINATIONS THROUGH THE BROADCASTING WORLD.

BY J. J. T.

(*Continued from page* 180.)

THERE are cases, no doubt, where the unsophisticated owner of a loudspeaker is under the impression that by increasing its volume one is unselfishly giving pleasure to neighbours and passers-by who—poor unlucky ones—are not in a position to afford the luxury of a "super" set.

Hugh Scott in his recently published book on "Good Manners and Bad," an historic treatise on past and present manners in this country, is inclined to compare the abuses perpetrated by the owners of both gramophone and wireless sets with that of the road-hog of to-day, or let us say the misuse of the tooth-pick at a public dinner in the early part of last century!

However this may be, one thing is evident and that is the dissatisfaction of electrical engineers themselves with the present loudspeaker itself. Not more than three months ago Capt. P. P. Eckersley at an informal meeting of the I.E.E. opened a discussion on "Loudspeakers" which was eagerly followed by a very large and keen audience. The captain maintained that "it ought to be possible to assume that transmission could be effected without distortion, but there remained the difficulty of producing a sound-field round the listener equivalent to the sound-field at the microphone, and maybe much of the trouble arose because users expected *too big a compass of sound.*" Travelling over the possibilities of further improvement in loudspeaker construction, the opener of the discussion terminated by asking one or two questions, which themselves prove that the loudspeaker at its best is not yet considered to have reached perfection by those who undoubtedly are well qualified to know. Said Capt. Eckersley: "Where should progress lead? The human ear was drugged by noises to which it had been trained, and was unable to make an impartial selection of sound purity. It could not be assumed, therefore, that people wanted reality. What did reproduction mean? Should they aim at the perfect gamut without transients, or adapt distortion and dignify it by the name of Art?"

All of which brings us to a point where the whole question of "annoyance" by means of a loudspeaker appears to be a matter of differing tastes, at a given time, always remembering that, up to the moment the loudspeaker is an imperfect instrument in a very imperfect world of men and women.

Perhaps one of the best systems of broadcasting reception is after all that by means of headphones—except for dance music, as is sometimes provided on certain Continental long-distance trains. In Poland, for example, an attendant passes through the moving train and produces a pair of headphones duly sealed and sterilised, the hire of which for five or six hours is less than one shilling. Connexion is made at convenient plugging-in points underneath the luggage racks.

The huge amount of money spent on radio-advertising by American firms is scarcely realised this side of the Atlantic. Mr. E. P. H. James, Sales Promotion Manager of the American National Broadcasting Company, at a luncheon given by the Aldwych Club in London, stated that "*one hour's broadcasting-time on stations which covered the whole of the United States*, cost 10,000 dollars, and advertisers would in addition spend from one to seven thousand dollars on a single musical or entertainment programme to fill that time."

The average cost of a programme, however, worked out at about one thousand dollars, which, of course, includes stations of much more restricted ranges. Even so, the average half-hour programme, frequently contains not more than three minutes "sales talk."

Whether broadcast advertising is a use or abuse one must leave to those directly interested to decide, but that "listening-in" competitions such as the following have a touch of futility about them would probably prove the unanimous verdict of readers of the *T. and T. Journal.*

It is on record that a competition took place in Louisville, Kentucky, where a prize was offered to the lady or gentleman who should prove able to "out-listen all comers on the radio." A young woman won the prize after continuously wearing the headphones for 106 hours, but became delirious as soon as the strain of the contest had terminated, which in this particular case occurred just as the runner-up—a man—was announced as having fallen fast asleep!

The Electrician not so long ago published a photograph—which by the courtesy of that long-established technical weekly is hereunder reproduced—illustrating quite another type of broadcasting competition which took place at the Los Angeles Radio Show, where each one of a large fleet of perambulators was equipped

with receiving apparatus, each perambulator being tuned in to a different station. Various bed-time stories were then broadcast, the prize being awarded to the story-teller whose respective baby first succumbed to his soporific tale!

There are features of broadcasting which obviously contain far-reaching potential utilities such as experiments carried out by our own Air Ministry, whereby by means of the Fultograph or other wireless picture system it is hoped that weather charts will be broadcast for the use of both air and seacraft.

Developments are also proceeding along the lines of a combination of aircraft photography and wireless broadcasting, whereby photographs of submerged vessels, wrecked or active, may be taken from the air, and the location and particulars duly diffused, to be picked up either on sea or land.

There is naturally a double-edge to the advantages of broadcasting in certain applications of this science, such as the dissemination of news regarding fugitive criminals. The Berlin police last month sent out the description of a known swindler, in fact it has apparently become something of a German routine procedure. One would, however, estimate that such information could easily act as a danger signal to the fugitive himself, who would thus gain considerable time over the sleuthhounds of the law. So subtle is the human mind, however, and at times so surprising are its reactions to circumstances and conditions, that in the particular case quoted the Berlin *Polizei* were astounded to see the wanted man walk into the police-station half an hour after this particular description had been broadcasted. According to the Berlin correspondent of the *Daily Telegraph*, the explanation of this rapid surrender was, "now everybody knows the sort of man

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I am, I can no longer bear to be such and I would rather go to prison."

Another writer in the same newspaper aptly appeals to our own B.B.C., if in anyway possible, not to give the British Public a *Police* Gazette every evening, for, continues the humorist, "it is not every man who is inspired with a desire to do a far far better thing than he has ever done by listening to broadcast warnings"!

Here, indeed, we have a case where there is decidedly room for two opinions as to "use" and "abuse" of broadcasting.

(*To be continued.*)

THE MAINTENANCE OF TELEPHONE PLANT.

H. G. S. PECK, B.Sc. (HONS.), M.I.E.E.

(*Continued from page* 175.)

Secondary Cells.

The maintenance of secondary cells is based on the variation of specific gravity with charge and discharge. A log-book containing a complete history of the attention given to the cells is kept for each battery and for large batteries particulars of every charge and discharge are recorded therein.

A test charge and discharge are made when the battery is installed or when any major repairs or renewals are carried out. On the test charge the battery is considered to be fully charged when the P.D. and specific gravity remain comparatively steady for 2 hours; the test discharge is made at the 9-hour rate and is ceased when the P.D. falls to 1.83 volts per cell. The specific gravities are recorded over the discharge period and corrected to a temperature of 60° F., and from the range of gravity the ampere hour capacity per hydrometer division (.001 S.G.) is determined for the battery.

Under working conditions the battery is discharged over the full range of specific gravity whenever circumstances permit, the average discharge being not less than 90% of the capacity. The P.D. of the battery is checked during discharge and departure from specified minimum voltages, for various discharge rates is an indication that some internal short circuit exists, that the battery has lost capacity, or that it has been discharged through more than its proper range. Typical minimum permissible voltages are 1.795 volts at 5-hour rate, 1.83 at 9-hour rate and 1.94 at 60-hour rate.

Discharged batteries are re-charged immediately at a rate which gives the greatest efficiency for the charging set, provided this is not greater than the ampere hour capacity divided by 4.5. When the P.D. per cell reaches 2.35 volts, the charging rate is reduced to a value between the ampere-hour capacity ÷ 12 and the ampere-hour capacity ÷ 15.

One charge during each month is continued until three successive half-hourly hydrometer readings on each cell do not vary by more than half a division (.0005 S.G.) and is called an equalising charge. Other charges are ceased when the specific gravity attains a steady value for half an hour.

The maximum specific gravity is not reached until some few hours after the charge has ceased; failure of the specific gravity to increase after the charge has ceased is a further indication of unsatisfactory conditions.

The electrolyte is kept at a level of not less than ½ in. above the top of the plates and is covered with a layer of pure petroleum oil. The oil prevents spraying and reduces evaporation to an almost negligible quantity.

Since the specific gravity fall during discharge is proportional to the quantity discharged, it is possible at any time to ascertain the residual charge on the battery by comparing its specific gravity with that obtained on the equalising charge and applying the ampere hour equivalent of one degree of specific gravity to the further available range.

Design.

Every detail of the design and manufacture of the plant has its effect on maintenance. Adequate factors of safety, especially in electro-mechanical apparatus, have not always been provided in the past, but the qualities of reliability and accessibility are now receiving much greater attention. It is obvious that the method which is cheapest in first cost is by no means necessarily the most economical when the annual charges for maintenance are properly brought to account.

A most difficult task in engineering is that of determining the proper stage at which improvements should be introduced and of deciding to what extent improvements shall be applied to existing equipment. Theoretically, such conditions should be reduceable to terms of £ *s. d.* but, practically, the precise value of many of the factors is indeterminate and, often, consideration for the reliability of the service has also an important bearing on the matter. Any change in design that cannot be, or is not, applied to all existing plant increases the difficulty and cost of maintaining the older equipment although, of course, the cost of maintaining the whole system may be reduced. Furthermore, the cost of maintenance is always increased by the existence of variations even though they all may be of the same efficiency.

Construction.

With standard methods of construction it is still possible for the maintenance to be considerably affected by the degree of foresight exercised in the erection or installation of the plant. The choice of alternative routes or even between the two sides of a road for an overhead line may considerably affect its reliability. The size and shape of manholes, the position of the entrances thereto, the exact position of footway boxes and the accessibility of cable joints affect the cost of maintaining underground plant. The difficulties in maintaining subscribers' apparatus are increased if protectors, terminal blocks and distribution cases are fitted in inaccessible positions, or if batteries are fitted where they are liable to be knocked or kicked over, or in the proximity of radiators or stoves where evaporation is accelerated.

The telephone system is continually growing and frequent extensions and modifications of existing plant must be made; a certain amount of experimental work is also necessary; such works inevitably disturb the service, and some faults always result. Plant is sometimes provided in the anticipation that it will be required for a limited period only and temporary methods of construction are adopted; unfortunately such plant is often retained in service far beyond the period for which it was originally provided.

Standards of Maintenance.

Omission to carry out a proper amount of preventive maintenance leads to an increase in faults, hence the making of an excessive reduction in costs by reducing routine attention leads inevitably to an increase in order to deal with faults, the second condition being worse than the first as less satisfactory service is given.

A liberal and extravagant provision of staff would enable every fault to be dealt with immediately it occurred, with a consequent short duration and an absence of faults carried over to the following day. A parsimonious provision of staff has the reverse effect.

Inefficient maintenance will lead to the occurrence of a large number of faults, long fault durations and high cost.

It is easy to say that costs should be low and faults few with their durations short, but these requirements are to some extent opposed, and the exact conditions to be aimed at as representing the ideal conditions of maintenance are not easy to determine.

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THIS WIRELESS BUSINESS.

BY B. S. T. WALLACE, C.T.O.

GREETING a colleague with the compliment, "You are a very good representative of public opinion, what do you first look at in the wireless journals?" I promptly got a reply (referring to a popular radio weekly), "The first two pages and the answers to correspondents. All the rest in between is the same old length of wire wound in a different way."

The first two pages of the journal referred to are composed of a medley of lighthearted gossip and banter around wireless things in general, and may be likened to the average amateur's junk box: full of rubbish, but not to be thrown away before careful scrutiny for fear of losing "just the very thing I want."

Even so with these paragraphs: they occasionally bring to light some useful information or reveal and illuminate a difficult or obscure technical point from an unusual angle. It is the same with answers to correspondents, unexpected sidelights on apparently simple everyday matters are constantly being focussed in a manner which amateurs of limited technical knowledge and experience find very helpful.

The one-time popular constructional articles seem gradually to be devolving into a stalemate. It is quickly realised that though new names are easily found for new sets, basically they are identical with hundreds of others in performance. No sooner is a design boomed as the last word in perfection when it is forgotten in favour of some "new" attraction which turns out to be an old friend of years ago.

Complete receivers, and sets of parts, are now so cheap that the average wireless man soon determines what type of instrument more or less suits his purse and purpose and thereafter rakes the wireless periodicals for those tit-bits of information which are likely to be of assistance in the maintenance, or improvement in the performance, of his own pet receiver. He wants to know more about the things which are too often taken for granted.

There is also the question of faults and failures; some of a minor nature, others leading to complete breakdown. They can at times be most elusive and baffling as the queries of correspondents frequently indicate.

It has been suggested that all these things come within the legitimate sphere of the *T. & T. Journal.* Although I do not wish to bring a millstone about my neck by inviting queries, an effort will be made in these jottings to touch upon points of general interest to the broadcast listener not too deeply versed in the practical technicalities of a subject which long experience alone can give.

With the high amplification now available in comparatively simple receivers, little consideration is given to the aerial and earth when it is found that the nearby stations come in with all the volume desired on a short length of wire suspended anyhow. If interest does not extend beyond the locals no comment need be made, but if the alternative of distant programmes is desired a great deal is being missed if the aerial and earth are not as good as they might be. Have we not all heard the story time and time again of how the enthusiastic Brown, after promising to demonstrate with his wonderful set the reception of distant stations on Jones' aerial, and failing to get beyond the local, blames everything, from the weather to evil spirits, when the only thing at fault is the aerial-earth system?

Unless one has had extensive comparative experience or knows exactly what to do and to avoid, it is impossible to say whether a newly erected aerial system is efficient or otherwise, and this will make all the difference btween getting or not getting those extra 29 stations.

Perhaps the majority at times turn in desperation to the foreign stations for a change of scene. Despite alternative programmes there remains that sameness of atmosphere, that absence of freedom and spontaneity which comes over so well from some of the foreign stations. They entertain their audience, while our own organisation appears more often to be entertaining the microphone.

So a few details not generally known about aerials and earths may be useful.

Summer time nowadays is a slack period in amateur wireless activity. Not so at one time. Before valves were discovered everything depended on the pick-up of the aerial system and the fine months were devoted to its improvement. There were no restrictions, and dotted about the country were to be found amateur lattice work masts up to 100 ft. in height with hundreds of feet of wire attached to them. Aerials of any sort were comparatively rare. If one attempted anything ambitious he was sure of a certain amount of fame among his brother amateurs, who would often ask to be allowed to hear signals they knew the larger aerial would bring in, but which would not be audible on their own limited erections. They would often travel many miles for the thrill of it.

An increase in height and length of wire always resulted in an improvement in the reception of the distant stations. True, the volume of atmospherics was also increased, but as the net average result was a better signal this consideration would be ignored. Exactly the same applies to-day. The more you put into the set the greater will be your factor of what we might term the satisfactory and consistent reception of distant stations.

An important point to note is that a number of valves do not convert a small aerial into the equivalent of a large one. If the small aerial does not pick up a signal no amount of amplification will reveal it. Valves will only amplify what your aerial has already picked up.

In case it should be argued that, theoretically, any piece of wire picks up every signal passing, so to speak, and that it only requires sufficient amplification to resolve it, the answer to this academic point is that the valve capable of doing it is not yet with us. A series of valves does not help, because only the first H.F. valve can magnify the aerial signal, the remainder merely amplifying what the first passes on.

If the reception of distant stations—and one can in this respect regard anything beyond 50 miles as being "distant"—is contemplated, then it is advisable to make the aerial and earth as good as possible.

To commence with, we are legally limited to an aerial length of 100 ft. I wonder how many broadcast listeners know the origin of and reason for this limitation? When reaction first came into use it was found that an oscillating receiver attached to a large aerial could be heard many miles away; the larger the aerial the greater the interference likely to be caused by these oscillations. This serious menace to reception and the difficulty of preventing or controlling reaction at an almost unlimited number of receiving points was early realised, and the danger minimised at the outset by the restriction of aerial length.

The dominating factor in an efficient receiving aerial is its height above the earth and surrounding earthed objects. The best broadcast aerial would, practically speaking, be a vertical wire 100 ft. in height. Failing the ideal we must attain as great a height as possible and dispose the remainder horizontally. For distant reception no advantage is to be gained by using a shorter aerial than 100 ft. The received signals will actually be weaker both on the 300 to 500 metre waveband and particularly on the higher wavelengths.

This fact in some instances may not be apparent because the shortening of the aerial will with certain old types of receiver enable reaction to be more readily obtained, and so bring in a signal that might otherwise not be heard; but this is a failure of the set and not a virtue of the small aerial. (Measurements of aerial signal strength must be made without local reaction.)

A reduction in the length of the aerial is a recommendation frequently put forward as a remedy for inselectivity in a receiver. This is wrong in principle. The apparatus should be made more

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selective to enable it to make use of the greater energy available with the larger aerial.

Some of you will no doubt murmur a protest against the unsightliness of aerials in general and particularly amateur efforts to attain great heights—though I know there are a select few who will always look upon a mast of over 50 ft. in height as a "thing of beauty and a joy for ever."

The aerial wire itself is probably the most unsightly part of the system, and perhaps it will arouse a new interest when you hear that your ugly 7/22 copper or insulated ex-field telegraph aerial wire can be replaced by something which is practically invisible when suspended in the air, costs about threepence, and will not only give results equal to anything you may have but in many cases a definite improvement.

Freak wires at fancy prices have been marketed for aerial wires with glowing promises of wonderful improvement in reception, but try how you will not one of them will give you a better signal than a length of 26 S.W.G. enamelled soft copper instrument wire. It is all but invisible, can if desired be attached to light and elegant supports, stretched taut to reduce sag, and is electrically efficient.

The heavier wires on the average mast sag a foot or more, and a loss in height to even this extent is quite enough to make an appreciable reduction in a weak distant signal. These wires, whether solid or stranded, are no advantage electrically.

A 100-ft. length of 26 S.W.G. weighs 2 oz. It will stretch about a foot or more—almost like a piece of elastic—when pulled taut by the guy ropes, and allowance must be made for this when erecting. Though it is not nearly so strong mechanically as the normal bronze line wires of heavier gauge, it is quite strong enough for a single aerial length and will withstand the fiercest gales.

You will find this type of aerial well worth trying, especially if an endeavour is made to get every inch of height and length above and away from surrounding objects.

For insulation, a single small porcelain pigeon's egg insulator is fully efficient.

The earth connexion is quite as important as the aerial, but the improvement of a good water main earth usually entails a considerable amount of work; conditions are not always favourable for the making of it; and it may be inconvenient to house the receiver in the desired position.

Theoretically, the best location for the set is literally on the ground right on top of the earth connexion. In practical effect, any wire leading from the earth connexion to the set is equivalent in its height and length to that same amount cut off from the aerial. In other words, if your receiver is situated on the first floor of a house and about 20 ft. or so above the earth connexion, the removal of it down to the earthing point will be equivalent, electrically, to raising the height of the aerial.

For guidance in the improvement of an earth, your standard of perfection is the metal hull of a ship at sea. This is the best possible "earth."

Should you contemplate in your pensioned leisure, in a quiet bungalow amidst the trees and fields, the spending of many happy hours with the ideal presentation set, do not at any time be tempted to take your receiver for test on board a ship. That cottage will vanish in a flash. You will for ever after sigh for a good old copper-bottomed windjammer complete with a 150-ft. mast, anchored snugly in a backwater of Falmouth Harbour. The romance of it will appeal to you strongly, for in no other place does a wireless receiver give so well that sensation, of the "Whole world being at your feet."

The nearest approach to the ideal on dry land is a series of metal plates buried vertically immediately beneath the aerial. Zinc is perhaps the best metal to use, but well galvanised iron is a good substitute.

A precaution to be observed in running an earth lead is that if it is not insulated the wire must be prevented from making bad or intermittent contact with conducting and semi-conducting surfaces such as damp walls, rain water and waste pipes. Contact with these may have the effect of varying the earth capacity and resistance, with a consequent fluctuation in the tuning adjustments, especially on selective and sensitive receivers.

Interference from neighbouring electrical apparatus and between adjacent parallel aerials are problems continually arising. The former, generally speaking, can only be cured at the source. The use of a counterpoise instead of an earth connexion is no remedy as a general rule. At best it will only reduce both interference and signal strength. It is much the same with frame aerials. Those who tried to use the latter in the vicinity of the recently abandoned Southern overhead high-tension electric railway, found interference from this source every bit as bad on a frame as on the open aerial.

An interesting point with regard to the selectivity of frame aerials as embodied in portable receivers arises in Cornwall. Most of the early portables were in their circuit arrangements inselective and relied on the orientation of the frame for selectivity. Daventry 5XX was the only English station to be picked up readily in that area, but this also placed the frame in a line with the P.O. station at Land's End, with the result that morse was frequently superimposed on the broadcast transmissions, despite the difference in wavelength.

The mutual interference of adjacent parallel aerials causes a variety of difficulties. To some extent each is continually acting as a wavetrap to the other. There is a way of materially reducing this effect by taking the lead-in from the opposite ends of neighbouring aerials.

If your aerial is of the conventional suburban type with one end fixed to the house and the other to a mast at the far end of the garden, with the lead-in taken from the house end, and your neighbour's is of a similar type and apt to upset your tuning or cause a partial wipe-out, take the lead-in from the distant end and leave the house end free. The longer lead-in will not otherwise be a great disadvantage unless it comes back very close to the top part of the aerial. Aim at getting as wide an angle as possible between the top portion and the lead-in.

The popular type of three-valve receiver is apt to be overloaded by the local transmissions. The incoming signal can very conveniently be regulated by a simple water resistance leak connected between aerial and earth.

Obtain a small glass jar about three inches in diameter and fill with water. Suspend in this on each of two convenient supports, a carbon rod from an old flash lamp or H.T. battery, or any piece of metal. Connect one to the aerial and the other to the earth. Regulate the distance between the rods till your incoming signal is the required strength. This is an instructive little arrangement which will give a very wide range of resistance values and does not affect your tuning. With a little junk and ingenuity it can be made up in other forms, such as with a piece of glass tubing and two corks, the electrodes being made a sliding fit in the corks. The ordinary anode, or any other type of non-inductive resistance, can also be used for the purpose.

Just one more hint: The wavelength of the national transmitter was found to be too low for many old receivers and almost without exception the remedy advocated for this was either, or a combination of, a reduction in aerial size and a series aerial condenser.

There is a better method. If your aerial tuning arrangements will not get down to the short wave, place an inductance in parallel with the aerial tuning inductance. This need not be embodied in the set but can be placed outside and simply connected across aerial and earth. If, for instance, your normal aerial coil approximates to a 40-turn coil and you wish to tune below its minimum, place another basket coil, plug-in coil, or simple solenoid of from 20 to 40 turns across the aerial and earth. Conditions will vary somewhat with circumstances, but a little experiment will soon put you in the right direction. Correctly done, this will bring in the lower wavelength without the inevitable loss of efficiency incidental to a series aerial condenser or a restricted aerial.

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TELEGRAPHIC MEMORABILIA.

THE telegraphic world generally is all out in its endeavours to avoid a balance on the wrong side of the ledger, and with this end in view keen eyes are eagerly looking out for some new point where economies may be effected. Wisely the American companies are never loth to catch a chance in this direction, although the telegraphs in the U.S.A. are fully solvent.

Thus one is not surprised to read in the American telegraph press that experiments are being carried out in Denver as to the longevity of the shoe-leather of its 500 telegraph messengers. Everyone of these five hundred lads have been equipped with shoes of special leather and make, and each is supplied with a reliable pedometer.

The shoes are only worn when on duty, and so far the following figures have been obtained. The average messenger walks 10 miles per day delivering telegrams. In four months he will have walked 1,280 miles. The average weight of the Denver messenger is 128 lb. From these figures it is computed that the pressure on each pair of shoes for the period mentioned amounts to three hundred million pounds, or 150,000 tons. "That is to say," finishes the report, "each shoe would receive 75,000 tons pressure, or more than the gross tonnage of the *Leviathan*."

Unfortunately that is all the information at present available. Should it subsequently transpire that as a result of these statistics a messenger-proof material has been found guaranteed to last twelve months or even longer, the writer will most gladly and dutifully pass on the information to the authorities concerned.

Meanwhile, simultaneously with the above there has come to my hand the prospectus, with sketch, of a substitute for hand towels which might possibly prove of use to our own service in reducing the length of Casual Reliefs! It is British made and may be obtained within half a mile of Charing Cross. It is known as the Electric Hand Dryer, and is designed "to dry the hands in record time,"—in 30 seconds actually—without making use of towels. Thoroughly hygienic it is guaranteed not to cause cracked or chapped hands. In fact an advanced type of this new electrical machine with its *three* jets of hot air, "has also the advantage of making the apparatus adaptable for drying the face!"

Congratulations to the employees of Standard Telephones & Cables, Ltd., who according to *The Electrical Review* have recently had a very considerable enlargement of their non-contributory pension scheme, and which now covers every employé of the company, including hourly-paid workers.

It is reported that a successful television demonstration took place in the laboratory of the General Electric Co. of New York, when a play was audible and visible in a theatre at Schenectady a mile away. No definite details of this experiment have up to the present apparently reached this country, and so much depends upon the conditions under which the experiment was made.

In the meantime, according to an actual case which was presented by a lady with a grievance before the magistrate of Tottenham (England) police-court, someone has invented a very marvellous apparatus. The lady in question seriously complained to the magistrate for an injunction against a neighbour who she alleged had a television set and was continually taking pictures of herself and her husband when they were at home together!

Promotions.—Congratulations to the, in round figures, two dozen ladies who last month received their respective promotions from Telegraphists and Telephonists, &c., to higher ranks in connexion with the C.T.O. In more than one case it can be safely said that, "she will be severely missed" from the field of other activities.

To Mr. P. Crisp of the Cable Room also upon his well-earned promotion to the Asst. Supt. Class, Telegraphs C.T.O.

Personal.—While congratulating Mr. W. Day upon his rise in the Engineering Service, it is a matter of personal regret, shared by not a few that his advance means removal to the Provinces. The T. and T. Society will surely miss him at their gatherings, which he not infrequently enlivened when he rose to contribute to a discussion—no matter upon what subject.

To Messrs. F. Poffley, Asst. Supt., A. Bing, Overseer, A. Jay, and G. Matthews sincerest wishes for a long and happy pensioned life, the latter almost the last of the Submarine Telegraph Company's telegraphists transferred to the Government service in 1889, when that company was absorbed by the British Post Office.

Obituary.—Following quickly upon the death of Mr. John B. Murray, mentioned in the last issue of the *T. and T. Journal*, came the news of the passing of Mr. R. Collihole on Sunday, June 8. Formerly of Torquay Post Office, for some years of his retirement he had been closely associated with J. B. M. in his activities at Ellacombe Church, South Devon.

Round the World.—BELGIUM.—The Fourth International Conference on Wireless Regulations is to be held at Liege from Sept. 22 to 26 next. The meetings will be officially opened by M. Forthomme, Belgian Minister of Posts and Telegraphs. It is expected that when the two high-powered stations are opened near Louvain they will secure easy reception all over the British Isles. Both, it is claimed, will be heard with greater clarity than 5 GB, and both have agreed to broadcast regular programs for British listeners, says the *Daily Express*. One of these stations is the property of the Radio-Belgique Corporation, while the other belongs to the Flemish Catholic party—which, as is known, is particularly interested in the preservation of the Flemish language. CHINA.—*The Electrical Review* states that a program of repair and improvement of all Government telegraph lines throughout China has been formulated by the Telegraph Administration Department of the Ministry of Communications. It will take six years to complete the entire program. During the first year a total of 4,773 miles will be renewed, including the Nanking—Hankow, Peiping—Tientsin, Hangchow—Foochow, and five other main telegraph lines and their various branches. During the second year 3,398 miles will be repaired, including the Hankow—Canton, Hsuchow—Tsingkiangpu, Hankow—Chungking, and Kalgan—Lanchow lines. In the third year 2,984 lines will be dealt with and the remaining three years will be devoted to the replacement of old apparatus and other improvements for the various main and branch lines. To minimise the danger of attacks by pirates when sailing in Chinese waters, Marconi automatic transmitters fitted in a fireproof safe and equipped with the necessary power have been provided for shipping. The simple closing of a switch sets the transmitter in operation, the safe is then locked, the automaton persistently signalling the ship's call sign and the request for assistance, while the continuous radiation provides an excellent signal from which directional bearings may be taken. A contract was recently signed by the Nanking Government for the erection in Nanking of a powerful broadcasting station. The Telefunken Co. of Berlin represented by the Siemens China Co. has secured the order, and the plant will be erected near the Yangtsze River with two 400-ft. steel masts. Power plant of 600 h.p. will render the station independent of power supply from the city electricity works. A cable connects the station with the studio in the centre of the Republic's capital. CANADA.—Reuter's Toronto correspondent reports the inauguration of a wireless network by the Ontario Provincial Police which will link up district police stations all over Ontario with the departmental headquarters in the city. The code to be used is to be a secret one and the wavelength will be known only to provincial police officials. Each district will have its own radio operator. FINLAND.—The number of licensed listeners now totals 90,232, of whom some 12,984 are of Swedish nationality. FRANCE.—It is understood that, in addition to the short-wave transmitting station now being erected in the Rue de Grenelle, Paris, another is to be built at St. Germain. The Eiffel Tower short-wave station is now to be used as the centre of an extensive police radio service. Receiving stations will be established all over France and at boundary towns and seaports. GREAT BRITAIN.—The number of broadcast licences continues to increase.

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(See "Parliamentary Items.") In connexion with the scheme to build a national repertory theatre in London as a Shakespeare memorial, it is suggested that the Government should make an annual grant of £100,000 for a number of years to meet interest and sinking fund charges, such grant to be made from the proceeds of wireless receiving licences. There is no great public support for the scheme at present. The London *Daily Telegraph* states that the B.B.C. engineers consider that a site near Falkirk is the best for the Scottish regional broadcasting station. When completed it will mean the closing down of the stations at Glasgow, Edinburgh, and Dundee. HUNGARY.—In connexion with the reorganisation of the country's broadcasting system, the Postmaster-General has granted the necessary licence for the erection of a new transmitting station near Budapest of 120 kw. against the present station's 20 kw. power. Should it not serve the whole country adequately, relay stations may be established, and it is intended to use short waves in addition to the normal band, mainly to serve the farmers. INDIA.—The Government of India has completed its selection of personnel for the new Indian Broadcasting Board. It will have as chairman, says *The Electrical Review*, the member of the Viceroy's Council concerned, and its other members will be two non-officials and two officials. Of the last named, intimates *The Times*, one will be a financial adviser, and the other will probably be selected for his administrative experience. IRISH FREE STATE.—In the course of his Budget speech in Dail Eireann, the Minister for Finance announced that the import duty on wireless apparatus produced over £30,000 in the year under review, an increase in round figures of £4,000 on the previous twelve months. Four years ago the anticipated amount was £20,000. It had been steadily rising and it was thought that it could now be safely stated that the yield would not be likely to fall below this year's figure. When the new high-power station had been erected, the amount of the tax levied and the sum received for licences, the combined yield would be definitely devoted to improving the broadcasting service. ITALY.—A census of listeners is being conducted throughout the country. Special forms have been distributed which must be filled up by every householder, without exception, who must declare whether or not a wireless receiving set is used. The number of *known* listeners for the whole of Italy is at present only 135,000. Signor Ciano, Minister of Posts and Communications, whose broadcasting schemes include the active encouragement of short-wave transmission, is also urging forward the opening of new stations, so that listeners all over the peninsula will be able to hear with quite small sets at least one of the national programs. *World Radio* states that the new stations at Trieste and Palermo will be opened within twelve months. It will be recalled that it was originally suggested to remove the 3-kw. Rome transmitter to Palermo, but this idea has been replaced by equipping both Trieste and Palermo stations with completely new transmitters. JAPAN.—The Japan Wireless Co., says *The Electrical Review* has installed short-wave transmitting plant of the R.C.A. type in the station in Aichi Prefecture, which carries on wireless traffic with Europe exclusively, while the receiving station at Yokkaichi, in Miye Prefecture, has been equipped with beam appliances of the Marconi type. MONGOLIA.—From the same reliable source it is understood that the construction of ten radio transmitting centres in inner and outer Mongolia and Tibet is being planned by the Ministry of Communications. These will be operated by the Government, but in addition to the transmission of official dispatches will also be open for public communications. NEW ZEALAND.—From a report originating in the Trade Commissioner's Office in Wellington, it is gathered that although satisfactory results have been secured by the Post and Telegraph Department for some years, as elsewhere the telephone is rapidly superseding the telegraph as a means of speedy communication. NORWAY.—At present four private companies provide Norway with broadcasting facilities, each operating transmitters within separate and limited areas. This arrangement does not appear to have proved altogether satisfactory, and a reorganisation plan is accordingly in process of completion for submission to the Storting. *World Radio* in fact has definitely stated that the proposals recommend the formation of a new company, limited by shares, with the State as principal shareholder, to exist only until all the stations, present and prospective, have been paid for. Total expenditure anticipated to be not more than £250,000. Redemption of this amount anticipated by 1938. The further details are equally interesting but space compels brevity. Plan provides (1) for 43 transmitters (2) crystal reception to 90% population. (3) Present licence fee Kr. 20 reduced to Kr. 17. (4) Total licence income to go to new company, who will pay program company one third. (5) New company also to pay £11,000 per annum to State. (6) Program company to be organised by Press Association, Telegraph Bureau, Norwegian Association of Newspaper Owners including Oslo papers. (7) Local program councils in all important towns plus chief program council for nation. (8) Latter council will be drawn from Department of Church and Education, Commerce, University, High Schools, Press organisations, theatres, music organisations, authors' organisations, and last but not least LISTENERS. PORTO RICO.—There are now 1,072 miles of telegraph line in operation in Porto Rico. SWITZERLAND.—At the annual general assembly of the International Broadcasting Union held at Ouchy, the Broadcasting Section of the Portuguese Postal Administration and also the Radio-Ljublijana, of Yugo-Slavia, were admitted to active membership and the Columbia broadcasting system of the U.S.A. to associate membership. The Union now represents 330 transmitting stations, serving 22½ million families or about 90,000,000 individuals. An agreement for the establishment of a special wireless station for the League of Nations in times of emergency was signed on May 22 last at Geneva by Sir Eric Drummond on behalf of the League and by M. Motta on behalf of the Swiss Government. The station is to have a world-wide radius. U.S.A.—On May 2 the Federal Radio Commission suspended until July 31 its recent order changing the frequencies of 26 radio stations, but at the same time has withdrawn the concession to grant any dissatisfied station a hearing on June 17. URUGUAY.—By virtue of a recently passed law, says *World Radio*, an official Uruguaian broadcasting service has been made possible, and is to be placed under the ægis of the Department of Public Education. An honorary commission appointed by the National Administrative Council will prepare, broadcast, or re-broadcast programs for the use of public schools. The expenses of the service will be met by receipts from a duty of 60% on the value of all radio sets and accessories—and also on gramophones and gramophone records imported into the republic. The licence fee for each receiver will be £2 per annum, while "a fine of £20 will be imposed upon any theatre or public hall which refuses to allow performances to be broadcast." WEST AFRICA.—According to Reuter's Lisbon agency the new wireless station at Monsanto (near Lisbon) and that of St. Thomé (West Africa) have given excellent results. A great saving of both time and expense is anticipated, seeing that up to the present all official messages have had to be exchanged over privately-owned cable companies. It is believed that the Government will later on authorise private messages to be sent by these military stations.

Amy Johnson.—"Where the women are heroes, what must the men be like"?—C. Kingsley in "Hypatia."

J. J. T.

PARLIAMENTARY ITEMS.

ON June 3 Mr. Lees-Smith, Postmaster-General, informed Capt. P. MacDonald that the Prime Minister had recommended the Rt. Hon. J. H. Whitley for appointment as Chairman of the British Broadcasting Corporation.

On the same date, in reply to Mr. Day, Mr. Lees-Smith also stated the number of wireless receiving licences in force on April 30 last, was 3,117,000. There were no statistics available showing how many licensees used portable receiving sets.

Also, on June 3, Mr. Graham White asked the P.M.G. if he would state the number of employees in the Engineering Department of the Post Office on Jan. 1 1930, and the corresponding figures at the latest convenient date.

Mr. Lees-Smith said that the figures fluctuated considerably according to storm conditions. The number of employees in that Department on Jan. 1 last was 31,544. The corresponding figure on May 1 was 32,128.

J. J. T.

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RETIREMENT OF W. J. MEDLYN, M.I.E.E.

MR. MEDLYN retired from his position as Superintending Engineer of the South Lancashire District, after a period of service extending over more than forty years. The South Lancashire District includes both Manchester and Liverpool, and for the past seventeen years Mr. Medlyn has been in control of the provision, development, and execution of the works involved in the continuous extension of telegraph and telephone services.

In 1926-27 Mr. Medlyn was Chairman of the North Western Centre of the Institution of Electrical Engineers. He has for some years served on the Council of the Manchester Geographical Society. In consequence of his official position he has also served as Chairman of the Institution of Post Office Electrical Engineers.

A remarkable gathering took place on the evening of May 31, which was Mr. Medlyn's last day of service, and during the evening he performed his last official act in investing Mr. H. Martin, a member of the staff, with the Imperial Service Medal. A company of over 400 assembled and were received by the Chairman, Mr. T. E. Herbert, Mr. W. J. Medlyn, and Colonel Sir Thomas F. Purves.

After a light meal speeches in honour of the guests of the evening were made by: Col. Sir Thomas F. Purves; Messrs. J. W. Atkinson, Superintending Engineer of the North Eastern District; H. Downes; J. G. Maddan, Postmaster Surveyor of Manchester; T. McLeod; F. N. Harrop; C. H. Smith, General Secretary of the Post Office Engineering Union; G. H. A. Wildgoose, A.M.I.E.E.; H. Broadhead; H. Hepplestone, A.M.I.E.E.; and finally by Sir William Noble.

The presentation was then made by Mr. T. E. Herbert. The speeches had all of them in common the very high appreciation of Mr. Medlyn as an official and as a man, and universal regret was expressed at the termination of a long period of very happy associations.

The presentation took the form of a portable wireless set, a gramophone, a camera, and a handbag for Mrs. Medlyn. The ladies of the staff had, on an earlier occasion, given Mr. Medlyn a motoring picnic case, but perhaps one of the most striking testimonies to Mr. Medlyn's work in the district was provided on the occasion of the last Whitley Committee meeting, when the Chairman of the staff side presented a little token of regard for Mr. Medlyn, in appreciation of the kindly consideration and fairness of judgment which he had always delivered.

REVIEW.

"Commercial A.C. Measurements," by G. W. Stubbings, B.Sc. (Lond.), F.Inst.P., A.M.I.E.E. 320 pp. Published by Messrs. Chapman & Hall Ltd. Price 15s. net.

Measurements of A.C. quantities involve many more complications than are found in D.C. work, and a book of this nature must be distinctly welcomed. The usual book on this subject is either a treatise on testing or a more or less amplified summary of maker's lists. The scope of this book, however, is considerably broader than is indicated by the title, dealing largely, as it does, with the theory underlying the design and use of the various types of measuring instruments included. While not concerned in any way with details of manufacture, sufficient information is given as to the general construction of the instruments to enable the reader to understand their performance and the principles involved in the design, while the errors entailed by the various methods of measurement are also discussed.

The book, therefore, will be found of service to both users and designers of measuring instruments, while it will also prove to be a good text book for students taking the subject of electrical measurements in the examination for B.Sc. (Eng.) London.

A preliminary chapter is included on elementary A.C. theory, and subsequent chapters deal with the measurement of Current and Voltage, Power, Instrument Transformers, Energy, Power Factor and Frequency and Determination of Phase Sequence, Reactive Power and K.V.A., the final chapter dealing with Test Room Equipment.

This chapter gives a great deal of useful information, especially as regards plant for altering phase relations so as to obtain various power factors, &c.

The short Appendix included, dealing with the Trigonometry of A.C. Theory will probably serve as a useful refresher in many cases, as a book of this nature must of necessity involve a considerable amount of mathematics, but this has been simplified by the use of vectorial methods where possible, and the diagrams are of considerable assistance.

References are given to various authorities at the ends of the chapters so that particular points may be followed up if desired. Altogether it is considered a well-thought-out book and one that may be thoroughly recommended. J. McG.

TRADES AND PROFESSIONS.

UNTIL one happens to peruse a classified Telephone Directory, one does not realise the varied number of trades and professions that go to make up a telephone system.

Happening on one for the Liverpool and District was quite interesting. I found there were between a thousand and eleven hundred different classifications. One would think this must embrace every trade and profession in existence, but of course it does not. It seems, however, a pretty wide range for a district which is mainly known for its docks, shipping and port activities.

Among the professions, accountants and solicitors are well represented, the former rather exceeding the latter, but both are considerably behind the number of physicians and surgeons who outnumber the dentists by about two to one. What perhaps strikes one, in a district of this nature, is the number of farmers,

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nearly 300, thus showing that agriculture still holds an important place even in the midst of a large manufacturing district, and that the farmer is alive to the value of the telephone.

The tea merchants and the brewers about balance; this must afford some comfort to teetotalers. There are no less than twenty-three types of engineers and eighteen types of brokers. There is a manufacturer of iridium pivots, and one of garters, another of skewers, while one makes curled hair, and so one could go on; but there would appear to be little difficulty in finding on the telephone exchange one or more to satisfy any want of any kind.

W. E. G.

PROGRESS OF THE TELEPHONE SYSTEM.

THE total number of telephone stations in the Post Office system at the 30th April, 1930, was 1,889,193, representing an increase of 7,083 on the total at the end of the previous month.

The growth for the month of April is summarised below :—

	London.	*Provinces.*
Telephone Stations—		
Total at April, 1930	678,742	1,210,451
Net increase for month	2,959	4,124
Residence Rate Subscribers—		
Total	168,170	261,713
Net increase	1,048	1,293
Call Office Stations (including Kiosks)—		
Total	6,078	25,386
Net increase	62	311
Kiosks—		
Total	1,762	6,451
Net increase	53	120
Rural Party Line Stations—		
Total	—	9,983
Net increase	—	—
Rural Railway Stations connected with Exchange System—		
Total	17	1,671
Net increase	—	57

The total number of inland trunk calls dealt with in February, 1930 (the latest statistics available) was 8,638,363, representing an increase of 161,463, or 1.9% over February, 1929. Outgoing international calls numbered 43,241 and incoming international calls 46,971, representing increases of 1,531 (3.7%) and 2,379 (5.3%) respectively over February, 1929.

Further progress was made during the month of May with the development of the local exchange system. New exchanges opened included the following :—

LONDON—Addiscombe (automatic), Loughton.
PROVINCES—Aberlemno, Charlton-on-Otmoor, East Langton, Good Easter, Hale, Kinlet, Linley, Morland, North Waltham, Salmonds Muir, Tow Law (all rural automatic).

and among the more important exchanges extended were :—

LONDON—Wembley.
PROVINCES—Jesmond, Langside, Rhyl, Slough, Sunbury, Uxbridge, Willenhall.

During the month the following additions to the main underground system were completed and brought into use :—

Coatbridge—Bathgate,
London—Leatherhead,

while 73 new overhead trunk circuits were completed, and 85 additional circuits were provided by means of spare wires in underground cables.

GLASGOW TELEPHONE NOTES.

IT may be of interest to mention that 25% of the Glasgow District Telephone Accounts are paid over the counter at the District Manager's Office. We understand that Glasgow is exceptional in this respect. At all events, during the period of greatest pressure, the Cash Office is reminiscent of the barriers at an international match between Scotland and England, when special staffing arrangements have to be made to cope with the rush.

Miss Janet F. G. MacBryde, Clerical Officer, has put off the ties of official life to enter the bonds of matrimony. Miss MacBryde entered the service of the late National Telephone Company as a telephonist in August, 1909, and came over to the clerical side in April, 1914. She is held in the highest esteem by her colleagues, who could not, and did not, allow the occasion to pass without tangible proof of their regard. She was the recipient of many individual gifts and a handsome electric standard lamp and shade, with best wishes for her future happiness.

We take this opportunity of acknowledging our indebtedness to Miss MacBryde for her valuable work as Secretary and Treasurer of the Glasgow Office National Savings Association, the success of which, in no small part, has been due to her efforts.

We wish God-speed to Miss M. Mowat (Douglas), Miss M. D. Whiteford (Central), both of whom have resigned the service to take up residence abroad; also to Miss L. V. Fisher (Queen's Park) on her transfer to Belfast.

The first inter-office golf match between the Glasgow and Scotland West District Office staffs was played on June 13 over the Caldwell course. The match, as all such games should end, resulted in a draw, each side having four wins and one game halved.

The idea that telephone exchanges are also general information bureaux still persists :—

Telephonist: "Number, please?"

Caller: "Don't want a number, Miss; want to remove the stains of travel after a long train journey; can you direct me to the nearest Turkish baths?"

Telephonist: "At . . ."

Caller: "Thank you: knew that the telephone girls would best be able to help me."

A Day with Pepys.—Monday: Monday is the day on which to study the cost of living and to buy everything under price.—Waked up early this morning with a very high wind, and said to my wife, "I pray I hear not of the death of any great person, this wind is so high!" After reading a little in Cicero (whose eloquence is beyond all comparison, and I verily beleeve, that none shall ever equall it) I made me ready and to my office. Did pass the gate-porter, and he did salute me, and I do notice that his salutations are in exact ratio to his estimation of the standing and condition of the various officers. As I approached my room, a chamber-maid, with a room-cleaning air fluttered near by; she threw open the door, drew out a duster, and waved it without using it. I did also notice that my windows are made clean to-day. By and bye comes Captain Cooke, Sir W. Batten, Sir W. Coventry and Duncomb; and we all to Sir J. Minnes, and I did give them a barrel of oysters I had given to me, and there had good discourse about the getting and spending of money. And we all did agree that it was not the salary of any place that did make a man rich, but the opportunity of getting money while he is in the place. Among other merry discourse about spending money, and how much more the cost of living is now than it was heretofore, Duncomb did swear that hitherto he did live of £100 a year with more plenty and with greater pleasure than he can now for £200. Then we did discourse about the preparing of reports, and Sir W. Coventry did advise me in what I write to be as short as I can, and obscure, saving in things fully plain; and that the greatest wisdom in dealing with reports is to say little and let them get out what they can by force. At noon to the exchange, and so home where my wife had got ready a very fine dinner—viz., a dish of marrow bones; a leg of mutton; a loin of veal; a dish of fowl, three pullets, and two dozen larks all in a dish; a great tart, a neat's tongue, a dish of anchovies, a dish of prawns and cheese. After dinner did play bill-yards for an hour and did win 8*s*. of Captain Cooke and my Lord Bruncker. Did score 98 in one brake, the most I ever did score in one brake in my life; but my conscience troubling me for fooling away the time. Then the rest of the afternoon mighty busy at the Office till about six o'clock. It do seem that it is only a legend that there are waste-paper baskets in in Government Offices, as the floors are littered with dead papers. Then homewards, and on my way did see a fellow insult my wife. So I did give him a cuff or two on the chops, and seeing him not oppose me, I did give him another; at last found him drunk, of which I was glad. Then to Sir W. Batten's, where very merry, good cheer, and up and down the garden with great content to me. So to the Wardrobe, where I found my Lady had agreed upon a lace for my wife of £6, which I seemed much glad of that it was no more, though in my mind I think it too much, and I pray to be kept and to so order myself and my wife's expenses that no inconvenience in purse or honour follow this my prodigality. After this Mr. Butler, Captain Cooke and I to a tavern hard by where we sat till eleven at night. There Captain Cooke did give us a song or two; and without doubt he hath the best manner of singing in the world. And so home and to bed, but could not sleep all night, and being overheated with wine I made a promise next morning to drink no more strong drink this week for I find it puts me out of order. This do remind me that when I mind my business my mind is in good ease, and I sleep well, which methinks, should be a good argument to me never to do otherwise.

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PICTURE TRANSMISSION.

BY E. S. RITTER, M.I.E.E.

(Abstract of paper given before the Telegraph and Telephone Society.)

PICTURE Telegraphy may be defined as the transmission of print, drawings and sketches in black and white or facsimile, which is one type of transmission ; and the transmission of photographs and half-tones, which is the second type. Both types may be transmitted over a telephone line, radio service or perhaps a long submarine cable. All the systems which are mentioned require a sending apparatus, a receiving apparatus, and means for keeping the movements of sending and receiving apparatus in synchronism ; i.e., the two drums on which the sent and received pictures are mounted, must be rotated at exactly the same speed. In addition, arrangements are required for starting and stopping the apparatus at the commencement and finish of the picture transmissions. It was not until the advent of the thermionic valve and the photo-cell that the early picture systems could be developed to their present state of comparative perfection.

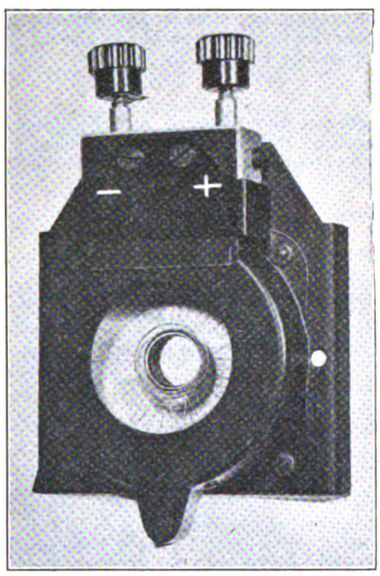

FIG. 1.

Now as to the means for transmitting the pictures. The sending apparatus has got to scan the picture or print to be sent, line by line, in the form of a spiral and originate an electric current proportional to the whiteness or blackness of the picture. A distinction must be made between those systems which send the current proportional to the whiteness of the picture, thus rendering intermediate tones, and those systems which only send a current for white and no current for black, thus giving no half-tones, but only black and white. A system working on the latter lines would transmit print and diagrams but would not be suitable for pictures or photographs containing a range of tones. The picture to be transmitted is usually mounted on some form of drum which is rotated and traversed in the same manner as a nut upon a screwed thread, so that all parts of the picture are brought consecutively under the influence of the sending device in the form of a long spiral. In some systems the drum the picture is mounted upon rotates and traverses, whilst in others the drum rotates and the sending device traverses ; or, alternatively, the sending device rotates and the picture traverses.

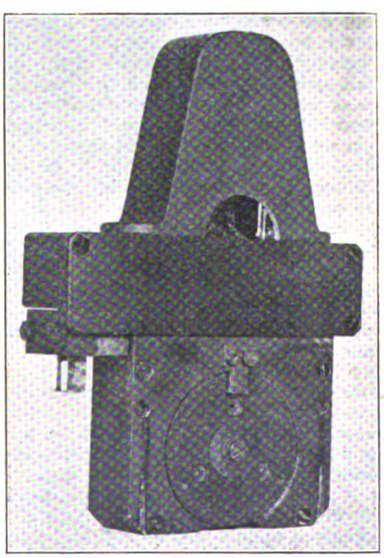

FIG. 2.

The device used for converting the tones of the picture into electric current is known as the photo-cell, and it consists of an evacuated or partly evacuated glass vessel with two electrodes and the necessary leading-in wires. One electrode, the anode, consists of a plate of metal or a grid of wire, the other electrode, the cathode, being a very thin film, generally of potassium deposited on the glass. When suitably treated this deposit emits electrons when light falls on it, the number of electrons being proportional to the quantity and intensity of the light. Its sensitivity follows that of the ordinary photographic plate—insensitive to red light but sensitive to the ultra-violet. By special treatment the colour sensitivity may be changed. The glass bulb may have a trace of hydrogen or other gas left in it.

On the table was a photo cell, also battery and galvanometer. The movement of the light spot on the galvanometer indicated the amount of current flowing through the galvanometer. When light from a pocket torch acted on the photo cell, the galvanometer light spot deflected, indicating the current flowing in the circuit. With red light from the torch no measurable deflection was observed; changing to green, an extremely small deflection was seen, thus showing that the photo-cell is relatively insensitive to the red light but sensitive to white, and slightly sensitive to green light.

The photo-cell shown was one manufactured by the General Electric Company at Wembley.

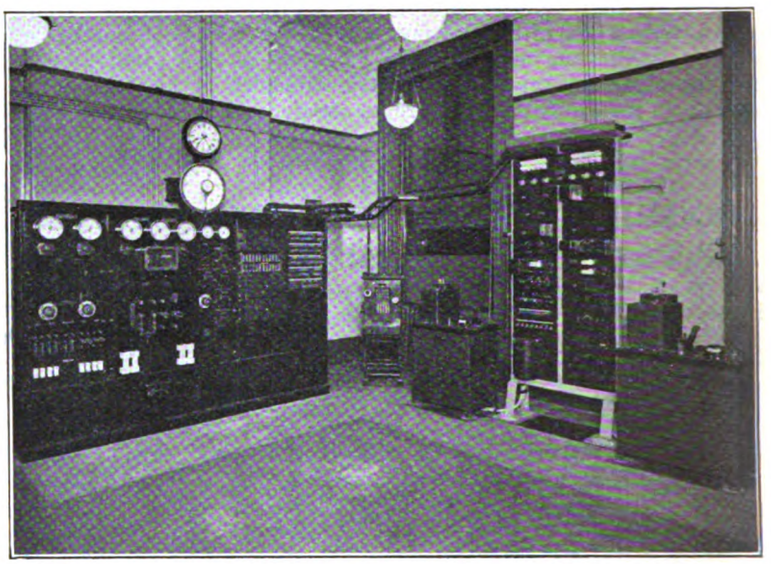

FIG. 3.

Fig. 1 is a view of the Siemens' photo-cell in its mounting. Showing the wire grid or anode. The light goes through the hole and is reflected back from the picture.

Sending.—The light from the sender lamp may be projected either on or through the picture to be sent. In other words, transmission either by reflected light in the case of the positive prints, and by means of transmitted

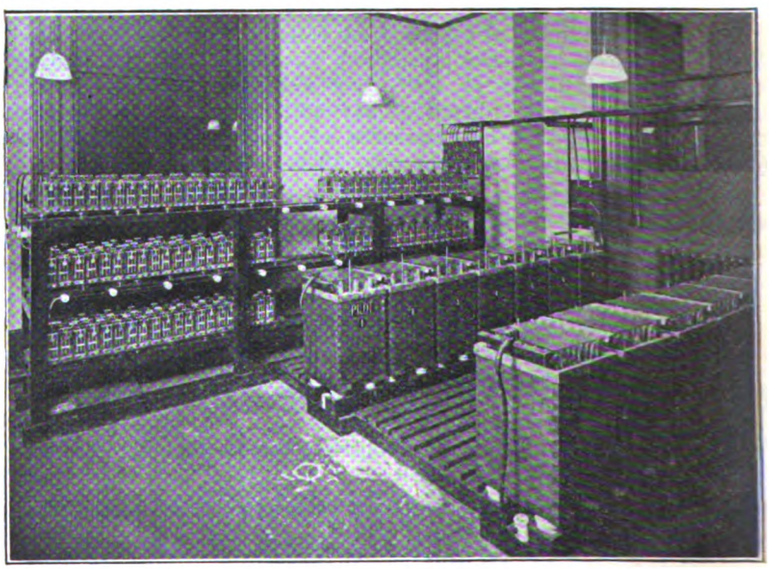

FIG. 4.

light, that is the light passes through the picture into the photo-cell in the case of films, negative or positive. In every case the reflected or transmitted light acts on the photo-cell. In one system the light is projected from a small spot on the picture and the reflected light is caught in the photo-cell ; in another system a larger spot is put on to the picture and a small spot of the picture focussed on to the photo-cell.

In all cases a battery draws off the electrons from the photo-cell in the form of electric current, which is extremely small, 1 micro-ampere or less. It is necessary that this small current should be amplified before it can be put on to a telephone line in order to be transmitted from one place to another. Therefore the photo-cell is connected to the grid of an amplifying valve or valves in order that it may be amplified to any desired extent. The type of valve is similar to those used in wireless sets.

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Care must be taken that the voltage applied to the photo-cells is not too great, as although the higher the voltage the more sensitive it is, too great a voltage produces ionisation glow. One generally uses as much voltage as one can—about 150 volts is quite a usual voltage, but the exact value depends on the photo-cell. Working 10 or more volts below ionisation point is satisfactory.

With a photo-cell there is an almost instantaneous response to the light in the form of electric current, so long as ionisation or glow does not take place in the cell. In earlier systems selenium cells were used but the response is not instantaneous.

One can either project on to the picture interrupted light, in which case the current that has to be transmitted to the line will have a frequency corresponding to the number of interruptions of light per second; or on the other hand, the amplified voltage from the photo-cell may be used to decrease or increase the intensity of an alternating current produced by some means such as a valve oscillator. In either case the strength of the current sent over the telephone line will be proportional to the whiteness of the picture, and its frequency in accordance with the number of light interruptions, or the frequency of the oscillator in cycles per second.

The reason for using alternating current in the line is in order to use a current of such a nature that it can be transmitted over a telephone line; frequencies within the voice range are suitable. The carrier frequencies generally used vary from 800 to perhaps 1,300 alternations or cycles per second.

At the receiving end of the line the reception is generally, but not always, done on either photographic paper or film. The *modus operandi* consists in having a light spot going over the film in the form of a spiral in the same way that the sending light spot went over the picture in the form of a spiral, and at the same speed; and being able to control the intensity of this light spot proportionally to the amplitude of the received electric current. If at the transmitting end a large current is sent for white, then at the receiving end the maximum amount of light is given to the light spot on the film, then when the received film is developed and fixed, where the light has come on it with a strong current will be black, and where in the original some portion was black the received film will be clear. Hence the reception is negative. If a positive is to be received on bromide paper, then the strong current received has got to cut off the light and a weak received current has got to make the light strong. So where the light is strong the picture comes out black; and where the light is weak the picture comes out white, or alternatively, a small current may be sent for white and a strong current for black, so that the control at the receiving end is as for the reception of a negative. It is in the photographic side where a good many of the troubles reside. One reason for this is that if the electric current is made absolutely proportional to the whiteness or blackness of the pictures being sent, and the light spot control proportional to the current received. It does not follow that a faithful reproduction in tone value will be given on a print. In the case of a print from a received negative, provided the exposure is right, the development is correct and the paper suitable, the tones may be nearly correct. But if a positive is sent and a positive received it is possible that the tones will be quite wrong. Therefore there

TABLE I.

COMPARISON OF SYSTEMS.

The following table compares the various systems. Some of the information may not be exact, but it is the best available.

System.	*Sending System.*	*Receiving.*	*Synchronisation.*
(1) SIEMENS KAROLUS ...	Interrupted light, light spot focussed on picture as spot 0.2 mm. dia. reflected into photo-cell. Interrupted light to fixed photo-cell for altering contrast in picture. Scanning disc geared to picture drum. Picture drum rotates, photo-cell traverses. Fixed photo-cell carrier added to picture carrier or picture carrier may be subtracted when receiving positive from positive sent.	Amplified A.C. to Kerr Cell, Sealed Multiplex type. No D.C. bias. Bias provided by fixed carrier. Drum rotates light spot traverses. Machine in daylight.	Valve driven tuning fork, thermostat control, drives alternator which controls D.C. motor. Phasing necessary.
(2) BELL	Fixed light through special aperture. Transmitted through prepared transparent film. Battery coupled amplifier. Picture current modulates oscillator produced carrier.	Amplified A.C. operating vibrating ribbon light valve, slow film used for receiving. Drum rotates and traverses. Machine in dark room with a red light.	Contact driven tuning fork drives phonic motor. Also modulates driving carrier sent to line along with picture carrier. Separation by ba d filters. Automatic start.
(3) BELIN	Interrupted light, large spot on picture, reflected light, small spot taken and focussed in photo-cell. Scanning disc independent drive. Picture drum rotates and traverses.	A.C. carrier amplified and rectified operates oscillograph light projected through specially shaped aperture. Drum rotates and traverses. Machine in daylight. Can receive positive or negative by reversing aperture.	Contact driven tuning fork operates phonic wheel motor. Automatic start.
(4) FULTOGRAPH	Pin point on copper foil with prepared picture modulates carrier.	Pin point produces image by electrolysis carrier amplified and rectified. Drum rotates pin point traverses.	Gramophone motor drive, mechanical governor, mechanical detent released electrically each revolution.
(5) MARCONI FACSIMILE...	Interrupted light, spot focussed on picture, spot reflected and focussed on photo-cell. Independent drive of scanning disc. Light spot rotates, picture traverses.	Amplified carrier to Simplex Kerr Cell. No. D.C. bias (black and white only) or Neon lamp. Reception on bromide paper. Spot rotates and paper traverses. Machine in orange light as paper exposed.	Valve driven tuning fork, thermal control, drives alternator holds D.C. motor in synchronism. Phasing required.
(6) NIPPON ELECTRIC CO.	Interrupted light, can use either transmitted or reflected light. Picture drum rotates and traverses.	Oscillograph movement vibrating with carrier frequency, special apertures for receiving positive or negative from either positive or negative sent. Machine works in daylight.	Phonic wheel control of D.C. motor either 100 cycles per sec. transmitted over line with picture beat frequency between 350 and 450 cycles per sec. used. Automatic start.
(7) BART-LANE	Five prints prepared on copper foil with different exposures, pin points make contact and operate 5 selectors which punch up 5-unit code telegraph tape for transmission. Pictures rotate and traverse. Now uses the photo-cell to operate the 5 relays which operate the punch selectors.	Five-unit code cross punched tape received from telegraph office put in machine. Light controlled by tape. Film on drum rotates and traverses. Machine works in daylight.	Machine motor driven. No synchronism. Tape started at correct position. End of line indicated by punching holes 1, 3, and 5 in succession.

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TABLE II.

COMPARISON OF SYSTEMS.

System.	Carrier frequency ( ) indicates adjustable.	Scanning Speed Cm./Sec.	Scan mm. per cycle.	Traverse.		Drum.		Picture.			Time min.	cm.² per min.	Tuning fork frequency cycles per sec.	Single space typewriting at 9.15 letters per square centimetre letters per minute transmitted by phototelegraph apparatus.
				mm. per rev.	Revs. per cm.	Revs. per min.	Drum mm.	Round cm.	Along cm.	Area cm.²				
(1) Siemens Karolus	1,125	21.6	0.192	0.2	50*	47	88	25	18	450	20	22.5	1020	206
	—	—	—	0.25	40	—	—	—	—	—	16	28.2	1020	258
	—	—	—	0.33	30	—	—	—	—	—	12	37.5	1020	343
(2) Bell ...	1,300	22.8	0.175	0.254	39.4	90	—	12.7	17.8	226	8	28.3	60	259
(3) Belin ...	(1,000)	19.8	0.198	0.185	54	72	—	15	10	150	8	18.8	32	172
(4) Belin ... (as altered by the *Scotsman*.)	(900)	25.9	0.288	0.185	54	72	—	20.1	15.1	302	12	25.2	32	230
(5) Fultograph	(500)	12.9	0.258	0.4	25	50	—	11.5	8.9	102	4.25	24	—	219
(6) Marconi ... (Various combinations of speed and traverse available.)	(5,000) to (10,000)	—	—	0.318 0.254 0.212 0.182	31.5* 39.4 47.3 55	20 30 40 60 80 120 150	88	26.7	25.4	678	—	—	300	—
(7) Nippon ...	1,500	15.7	.105	0.167 0.250 0.125	60 40* 80	60	50	14.7	11	162	13	13.8	100 or 350 and 450	126
(8) Bart-Lane	—	—	.339	0.509	19.7	—	—	10.2	8.9	90.5	32	2.8	When transmitted over Western cable at 1,620 letters per min.	25.6
(9) Proposed International Standard ...	1,300	20.7	—	0.1875	53.33	60	66	18	13	234	12	19.5	—	—
Will work to		27.6	—	0.25	40	60	88	25	18	450	12	37.5	1020	—

*Alternative traverses.

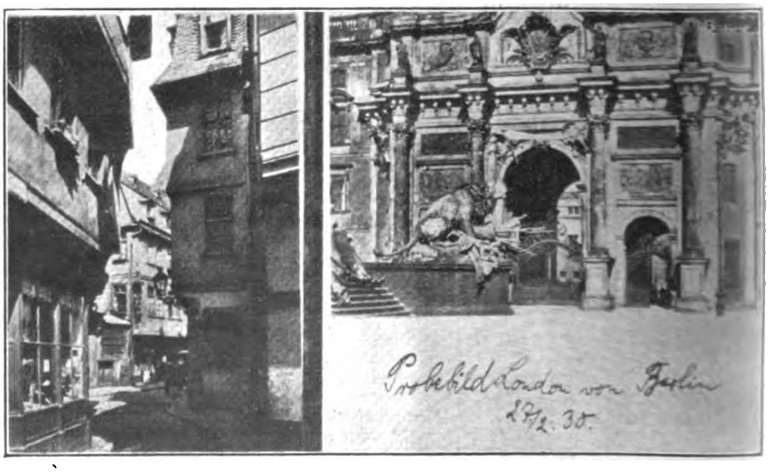
is quite a lot in connexion with the photographic side of the business as well as in the electrical side. Unfortunately in a photographic negative, if there is white and black in the original positive and grey is defined as being made up of an equal number of small black and white spots, then the grey in the negative reproduced is not the grey of the original. In other words the law between black and white on the negative is not straight line law, and this has to be taken into account in photography. Of course, photographers know all about this and their work cannot be criticised here.

There are several ways of controlling the small light-spot at the receiving end. One is to project a light on to a small mirror and wobble the mirror by the received current over the line amplified as necessary. Then in another system a thin metallic tape is caused to vibrate in front of an aperture through which the light is projected on to the film. The stronger the received current the greater the amount of wobble on this tape and the more light goes on to the film. In the system which the Post Office are using at the moment—Siemen's Karolus—the light is controlled by a purely electrical method. There is no question of moving anything at all. Polarised light is passed through the plates of a Kerr cell (see Fig. 2) when voltage is applied across these plates in proportion to received current; the light is increased and decreased, but unfortunately not in exact proportion. There are practically no adjustments to be made, and it is therefore simple to operate, having no moving parts to go wrong.

Then there are non-photographic methods of reception. A method of reception used on some of the radio services. A stream of hot air, controlled by the received current, impinges on waxed paper. The wax is more or less removed by the heat, and where the wax is removed the paper will take up ink.

Another method which has been used is to have a pin running over moistened chemically-treated paper, and the greater the current through the pin point the darker the picture. The electric current decomposes the chemicals and produces coloration more or less proportional to the current received.

The real trouble with picture transmission is the keeping of the two drums of two machines at exactly the same speed. It is necessary to drive the drums at exactly the same speed because if this is not done the pictures will look a bit peculiar at the receiving end. Accuracy is therefore necessary.



In the case of the Siemens' Karolus system the length of the spiral measured round a full-sized picture is 813 feet. The length of spiral of light-spot travel round the receiving drum must not exceed by more than ½ ths of an inch, plus or minus the length travelled by the sending spot! It takes

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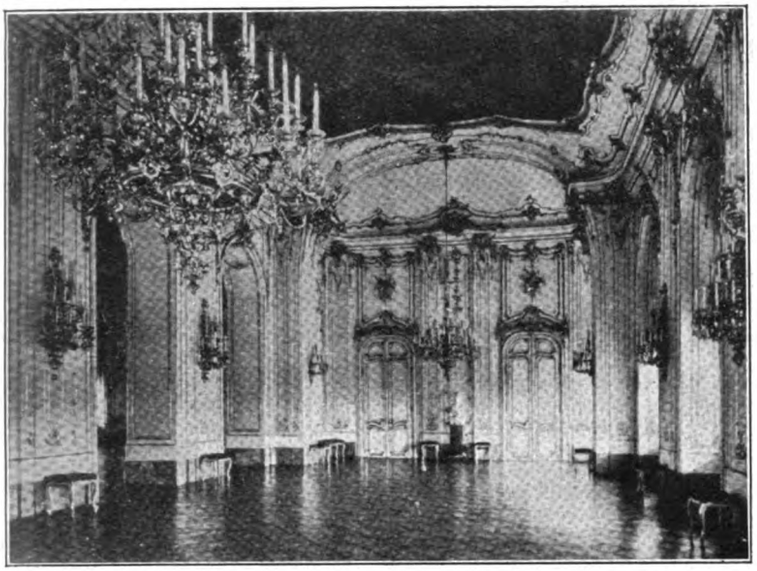
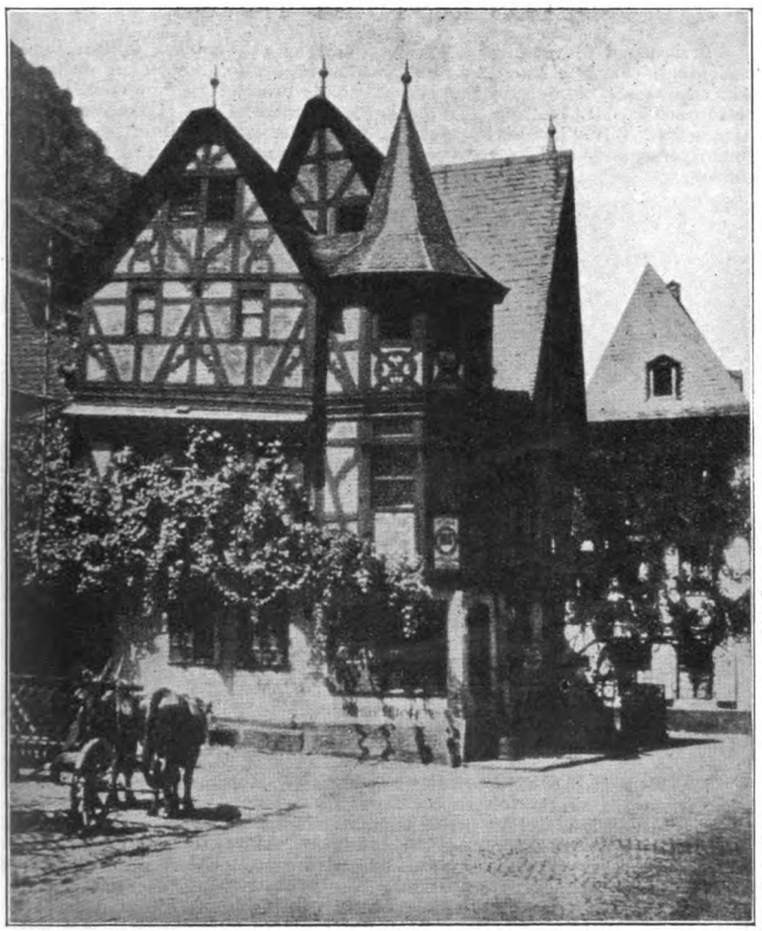


VIENNA—LONDON, FEB. 8, 1930. SCHÖNBRUNN PALACE.

about 20 mins. to travel the 813 feet. It can be seen that these drums are going at substantially the same speed.

There are various methods of driving the drums and keeping them at the same speed. One is by sending some tone over the line or using a tuning-fork drive—either device is used according to the system. Generally speaking, they work very well.



PROBEBILD. FRANKFURT—LONDON, MAR. 10, 1930.
AT BACHARACH ON THE RHINE.

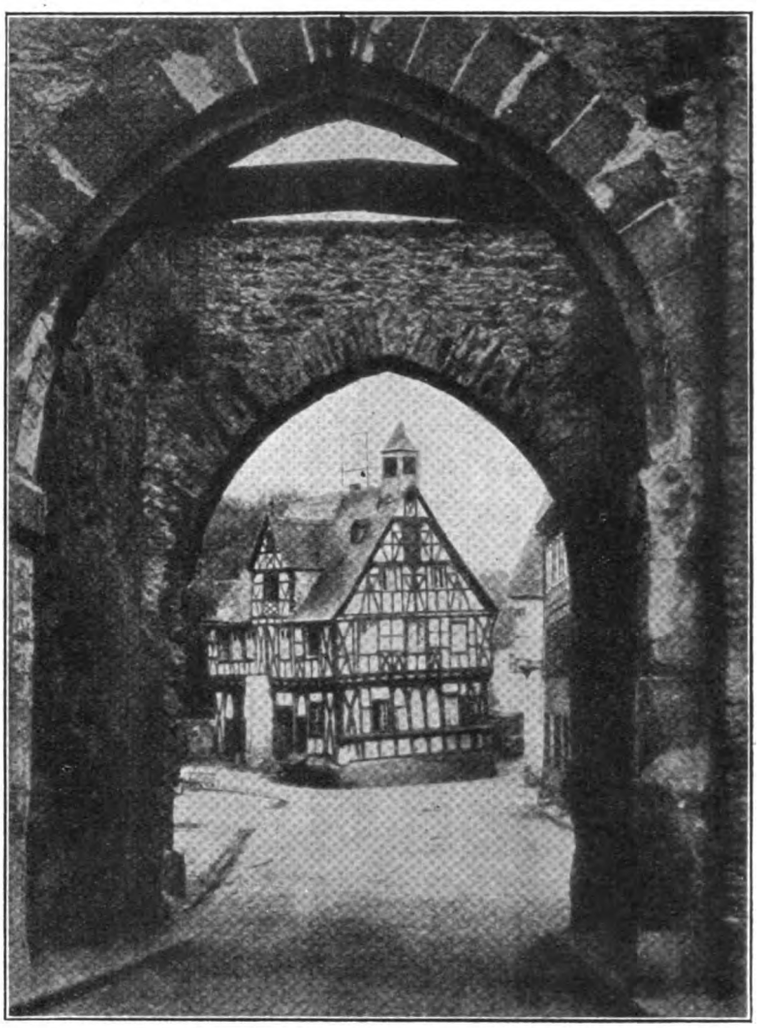
Sample pictures transmitted by the various systems—the Bell, for instance, which is much used in America, the Belin, and the Siemens' Karolus and Marconi's, &c.—were on the walls of the room for inspection.

* * * *

An experimental set of the Siemens' Karolus system was installed in the Post Office two years ago. In this system the sending and receiving was done on the same machine.

Fig. 3 shows the existing Siemens' Karolus set installed in G.P.O. West for working to the Continent. On the left is the power switchboard for charging the batteries, &c., next comes a small P.B.X., then the sending machine, control panels and receiving machine.

Fig. 4 shows the battery room with filament and anode batteries.



PROBEBILD. FRANKFURTMAIN—LONDON, FEB. 3, 1920.
RHENS ON THE RHINE.

Tables showing the characteristics of machines in use will, it is hoped, furnish useful information.

Table 1 gives the general characteristics and Table 2 speeds, sizes of pictures, &c., in so far as they are known to the author: in some cases the figures are only approximately correct.

At the present moment Public Picture Services exist between: London and Berlin, Frankfort-on-Main, Munich, Copenhagen, and Vienna, and in addition between Stockholm and stations, with the exception of London. A direct London—Stockholm service may be opened in the near future, the system used being the Siemens' Karolus. Also in Australia between Sydney and Melbourne.

Private newspapers have sets on either the Bell, Belin, or Siemens' Karolus systems at Paris, Hamburg, Milan, Leeds, Manchester, Glasgow and Liverpool.

In America public service on the Bell system is given between New York, Atlanta, Boston, Cleveland, Chicago, St. Louis, San Francisco, Los Angeles.

In Japan the Siemens' Karolus and Nippon Electric Co. systems are in use by newspapers between Tokio, Nagoya, Osaka, Kioto, Okayama, Hiroschima, Fukuoha.

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LONDON TELEPHONE SERVICE NOTES.

Contract Branch Notes.

THE business done by the Contract Branch during the month of May resulted in a net gain of 4,189 stations. The net increase in stations for the quarter ending March, 1930, was 11,966.

Telephones in London Hotels.—For some years determined efforts have been made to convince hotel proprietors that the telephone service is an essential part of the equipment of the modern hotel, and during the past 18 months some encouraging orders have resulted, especially in the Kensington district. Nineteen hotels have placed orders with the department, the average number of circuits being six exchange lines and 110 extensions per hotel. There is still a wide field for this class of business, which is being actively explored. Hotel proprietors are gradually becoming convinced that an up-to-date service of message transmission is as necessary as an efficient service of water or lighting.

Of the above-mentioned 19 hotels, 13 have discarded the use of bell signalling and are using the telephone for all services.

Marriage.—Mr. S. Hodgkiss, Clerical Officer, at the West District Contract Office, was married on May 24. His colleagues, in wishing him and his bride happiness and health in their married life, presented him with a canteen of cutlery suitably inscribed.

Retirement.—On June 13, 1930, Mr. W. C. Burrows, Contract Officer, attached to the West Contract Office, retired from the service. Mr. Burrows entered the service of the National Telephone Company in 1906, and, with the exception of the war period, during which he rose to the rank of colour sergeant, was throughout the whole time connected with the Contract Branch.

The staff at the West Contract Office presented him with a wrist watch (for Mrs. Burrows) and a cheque. The presentation was made by the District Contract Manager and Mr. G. G. Rogers (First-class C.O.) also said a few words of eulogy.

Obituary.—We regret to announce the death of Mr. A. F. T. Burrowes, Contract Officer, Class II, who passed away on May 26, 1930. Mr. Burrowes, who was 56 years of age, died suddenly from septic pneumonia. He joined the National Telephone Company at Brighton in 1900 and was transferred to the London Telephone Service in 1906. During the Great War he served in the Navy.

Mr. Burrowes was very highly esteemed by his colleagues and his untimely death came as a shock to his many friends. Our deepest sympathy is extended to his widow and daughter in their sad loss.

Contract Branch Cricket.—Two matches have been played in the Shield competition, both against the Accounts Branch. The first resulted in a win for the Contracts, the score being: Contracts 128, Accounts 103. It was an interesting match, and only some vigorous hitting by Murfit, who went in at the fall of the 7th wicket with the score 91 made victory possible. Fitzgerald was top scorer with a useful 34 and Doody secured 5 wickets for 28 runs.

The return game ended in a draw. Batting first, the Accounts compiled 93 runs in 2½ hours. Widdup and Vacher batted stubbornly without adding many runs. The Contract Branch were left with only 65 minutes in which to get the necessary runs. In the circumstances they did well to reach 80 for 6 wickets. Doody batted brilliantly in compiling 54 not out and Channing secured 4 wickets at small cost.

London Telephone Service Sports Association.

The first annual athletic meeting is to be held on the Civil Service Sports Ground at Chiswick, on Friday, July 18, at 5 p.m. The committee have arranged an excellent programme of events, full particulars of which can be obtained from Mr. G. W. R. Robinson, T/TKL, L.T.S., Cornwall House, Waterloo Road, S.E.1. A dance in the Pavilion will follow the sports, tickets for which at 1*s.* each can be purchased from Mr. George Lewis, AR4E, L.T.S., Cornwall House, Waterloo Road, S.E.1. Early application is desirable as dancing accommodation is limited.

Refreshments will be provided at moderate prices.

Football.—The annual general meeting was held in Cornwall House on Friday, May 30. In the report of the past season reference was made to the success of the team in winning the championship of the 2nd division of the Civil Service League without losing a match. Next season the team will be competing in Division I. Mr. Evans, who has so ably filled the position of Secretary for several years, has resigned, and Mr. Culley, of the City Contract Office has been appointed to the position.

Mr. Futerman will again be the captain and will be supported by Mr. Thomson, vice-captain. It is intended to run two teams next season and arrangements will be made to fix up a number of friendly games on opponents' grounds for a 2nd eleven. If the venture is successful, application for membership of the 2nd division of the Civil Service League will probably be made in the following season.

Personalia.

Promotions to Assistant Supervisor, Class I.

Miss E. A. Whythe, of Abercorn.
„ L. E. Spencer, of North.
Miss E. M. Elford, of Park.

Promotions to Assistant Supervisor, Class II.

Miss E. M. Burtenshaw, of Kensington.
„ D. F. Vince, of Wimbledon.
„ A. L. Curtis, of Tandem.
„ F. L. G. Adams, of Clissold.
„ W. G. French, of Trunks.
Miss A. H. Loutit, of City.
„ E. A. Messenger, of Regent.
„ C. G. Cousens, of Reigate.
„ W. M. Dunstone, of Emberbrook.

Resignations on Account of Marriage.

Assistant Supervisor, Class II.

Miss F. A. G. Schofield, of Erith.

Telephonists.

Miss H. K. Arney, of Victoria.
„ P. E. Heseldin, of Victoria.
„ E. S. Carey, of Willesden.
„ E. Hambleton, of Willesdon.
„ M. V. Phillips, of Terminus.
„ J. P. Burgess, of Park.
„ B. E. Cutler, of Riverside.
„ F. E. Ferrier, of Riverside.
„ H. Nield, of City.
„ G. E. Eddiford, of City.
„ M. E. Holmden, of City.
„ E. E. Francis, of Wimbledon.
„ J. M. Tuck, of Metropolitan.
„ N. E. Gearing, of Bexley Heath.
„ R. A. Wells, of Flaxman.
„ E. E. Hardy, of Brixton.
Miss D. J. Warner, of Richmond.
„ L. Forrest, of Tandem.
„ E. G. Russell, of Gerrard.
„ D. M. G. Roberts, of Central.
„ V. M. Watson, of East.
„ E. Miles, of Clissold.
„ A. L. Hardy, of Avenue.
„ E. M. Fuller, of Avenue.
„ I. M. Howard, of Bushey Heath.
„ M. P. Jennings, of Hop.
„ E. N. Randall, of Hop.
„ E. A. Joiner, of Streatham.
„ M. E. White, of Trunks.
„ A. E. Skelton, of Trunks.
„ H. Herron, of Trunks.

LEEDS DISTRICT NOTES.

IT is usual to visualise a Traffic Officer as a lynx-eyed, lantern-jawed individual, closely related to Sherlock Holmes, who dabbles in decimals, and carries a slide rule in his pocket. This description, however, cannot be applied to Mr. W. Tate, Traffic Superintendent, Class II (known to his friends as "Billy"), who has just retired under the age limit, and whose genial personality and breezy ways will be very much missed in the Traffic Office.

MR. W. TATE.

Mr. Tate is one of the fast disappearing "sixpenny telegram" staff. After graduating on the telegraph side, where he became a technical overseer, he transferred his activities in 1913 to the telephone service, and joined the Leeds traffic staff in 1914. He did his bit during the war training telegraphists at Aldershot, and since the war he has had the oversight of the transfer of 40 automatic and manual exchanges. The popularity of Mr. Tate, and his fellow officer, Mr. Goodwin, who recently preceded him into the state of well-earned leisure, was demonstrated by the large attendance at a "Tea" which was held at the Y.M.C.A. on June 3. The Postmaster-Surveyor, Lt.-Col. Jayne, D.S.O., O.B.E., M.C., presented Mr. Tate and Mr. Goodwin, each with an easy chair on behalf of the staff, and expressed his pleasure

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at seeing Mrs. Goodwin and Mrs. Tate present, not his surprise, at finding that one easy chair was regarded in both cases as sufficient. Tributes to the regard felt for both officers was also conveyed in neat and humorous speeches by Mr. Lawrence, Mr. Walker, Mr. Jowett, and Mr. Murray, who, in the absence of Mr. Bates, took over the duties of Chairman. Messrs. Tate and Goodwin suitably responded in characteristic fashion. Mr. Tate's reply was cheery, short and snappy, whilst that from Mr. Goodwin was longer, carefully worded, and drawing from his long experience, gave good advice to the younger members of the Traffic Section. A pleasant and enjoyable evening was tempered only with regret that it meant farewell to two very popular officers.

An interesting civic ceremony took place on June 3 at Hebden Bridge when the new post office was formally opened by Councillor E. Hartley, J.P., Chairman of the Hebden Bridge Urban Council. Mr. J. E. Barlow, in asking Councillor Hartley to open the new Post Office, said that he had felt the occasion was so auspicious in the daily life of Hebden Bridge that it should not be allowed to pass without some public ceremony. As the new building had fallen upon the birthday of His Majesty the King, Mr. Hartley and his colleagues on the Council forwarded a telegram of congratulation to His Majesty. Later in the afternoon the following reply was received from Buckingham Palace :—

> " I am commanded to convey to you, and to all who joined in your message, the King's sincere thanks for the good wishes to which it gives expression.—Stamfordham."

Lt.-Col. Jayne, D.S.O., O.B.E., M.C. (Postmaster-Surveyor), on behalf of the Department, thanked Councillor Hartley for his services and encouraging speech and hoped that the trade and prosperity of Hebden Bridge would increase so largely that he would at no distant date have to ask Councillor Hartley to open a new wing. Mr. Atkinson, Superintending engineer, also spoke, and asked those present to become missionaries for the telephone service. He asked them to praise the service when it was good, and if it was not good, to say so without any embroidery. A new C.B. switchboard which is being installed in the post office was equipped to enable demonstration calls to be made, and Mr. Murray (Traffic Superintendent) explained the operating methods which applied to the new system. During the tea which followed much interest was created by a demonstration Continental call from Rotterdam, Holland, to Mr. Pickles, one of the guests who were present.

We have to record with an expression of deepest sympathy the passing of Mrs. Bates, the wife of our District Manager, in a nursing home in Ewell, Surrey. Although of late years, because of illness, Mrs. Bates was unable to take any active part in social functions, it was known that she still took a close and personal interest in all matters connected with the telephone staff, and the staff feel that they have lost a sincere friend. The interment was conducted at Ewell and floral tributes of respect and affection were forwarded from the Leeds Exchange and the District Office staffs, and also from the staff of the Bristol District, where Mr. Bates had been stationed before coming to Leeds.

LIVERPOOL NOTES.

AN interesting function took place at the end of May at the Orrell Park Sports Pavilion, Liverpool, in connexion with the leaving, on promotion, of Messrs. Harding and Duxbury. A social evening was spent at which many of the clerical and traffic staff were present. Although perhaps the weather was more conducive to outdoor than indoor amusement everyone thoroughly enjoyed the singing of Miss G. Jones, of the Engineering Branch, and the dancing did not lack energy. During a break for refreshments, admirably served by the Ladies' Committee, the opportunity was taken to present each of the guests of the evening with a parting gift from their colleagues. This was done by Mr. Gauntlett, the District Manager, in a few well-chosen words. There was also a gift for their respective wives. Messrs. Harding and Duxbury thanked their colleagues for their gifts and their good wishes and both remarked that it was a considerable wrench for them to leave a district where they had spent the major part of their lives but they hoped they would be as happy in their new surroundings both so far as colleagues and environment were concerned as those they were leaving.

An event of interest took place in Liverpool on Whit-Monday. Chicago, U.S.A., have built a Temple of Commerce for the Corn Market and the President of the Liverpool Corn Trade Association was invited to participate in the opening ceremony by wire. This he did by pressing a key on a special circuit in the Liverpool Corn Exchange provided by the Western Union Telegraph Co., which had the effect of throwing on a screen in the Chicago Temple of Commerce the words " Greetings from Liverpool Corn Exchange." Simultaneously a telephone call from the Liverpool Corn Exchange was effected to the Chicago building and the President of the Liverpool Corn Association, Mr. Alex. Slater, junr., and several of Liverpool's civic and commercial leaders had conversation with Mr. John A. Bunnell, the President of the Chicago Board of Trade and others.

At the conclusion of the opening speech a great burst of cheering by the Chicago gathering was heard in Liverpool.

Considerable satisfaction was expressed at the very successful results and the Post Office officials were complimented on the arrangements made for the ceremony.

On Wednesday, June 11, the Liverpool Post Office Golfing Society again met in friendly rivalry their doughty opponents, the Manchester staff. The meeting was at Warren Hill Golf Course, Warrington. On this occasion the honours went to Manchester, who won the greater number of games. This is, perhaps, as it should be, as Liverpool won last year.

Most of the games were keenly contested and everyone voted it was a most enjoyable meeting.

These interchanges of social meeting are all to the good of the service where all meet on common ground and one gets to know the other fellow outside officialdom. Long may they continue.

A Birkenhead telephonist, Miss Dorothy Mather, has been selected from 50 candidates to represent the " Spirit of Progress " at the Manchester-Liverpool railway centenary celebrations at Wavertree in September. It is one of the only two speaking parts for women in a pageant of 4,000 players.

MISS D. MATHER.

She will wear an English sports costume of modern design and lead an international group against landed proprietors, tradesmen, and others who opposed the introduction of the steam engine. In a scene demonstrating how each change of transport disturbed the settled mode of living and affected recreation she will harangue the " stagnationists."

Miss Mather has had both footlight and microphone experience as an amateur.

She is delighted with the distinction of having secured one of the only two speaking parts for women, and hopes to play her role well, as she is in entire sympathy with it.

LONDON ENGINEERING DISTRICT NOTES.

AN interesting function took place on May 30 last in the Refreshment Room, Denman Street, under the Chairmanship of Mr. Gomersall, when we bade farewell to our old friend, Mr. C. H. Rodway. There was a large attendance from all branches and sections of the District. In his opening remarks the Chairman recalled his long and happy association with a valued servant of the Department. Tributes to his sterling qualities, kindness of heart, and capacity for hard work, were paid by Mr. Hart, Captain Hines, Mr. Freeman and several other colleagues, and his ever-ready willingness to give others the benefit of his wide experience was particularly emphasised. The Chairman then made the presentation, consisting of an up-to-date wireless set and loudspeaker, and a cheque for the purchase of an arm-chair. In felicitous terms Mr. Gomersall expressed the kindly feelings of the whole staff to Mr. Rodway, and expressed the hope that he would have many years to spend in his retirement. Mr. Rodway excelled himself in returning thanks for the gifts, and with a touch of humour recalled the many lessons he had learnt in the Engineering Department. There could be no mistaking the warmth of the ovation that was given to Mr. Rodway at the conclusion of the meeting.

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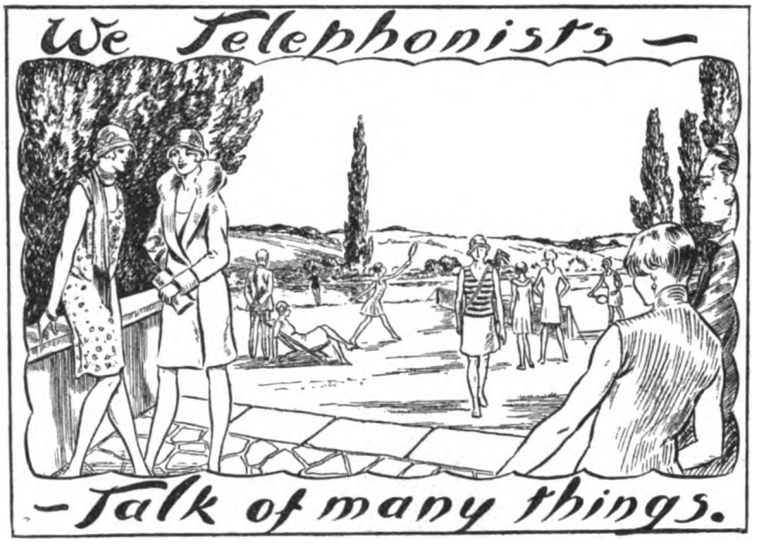

Haddocks' Eyes.

I THINK it probable that the White Knight was an income-tax official, for, despite his mild, blue eye and a kindly smile that lit up his foolish face, he put the Aged, Aged man through a severe examination as to his ways and means. He succeeded, no doubt, in concealing his true occupation from Alice, because he makes it appear that while the old man was talking he was thinking out schemes for dyeing whiskers, living on batter and preserving the Menai Bridge from rust. But all the time he was evidently making mental notes as to the Aged Man's occupation and profits and by his rigorous methods he secured not only facts but figures. One hopes that the old fellow had been honest in making his last return.

The Aged, Aged Man was surprisingly versatile and was a cunning craftsman. Who else but a poor man would—

" . . . hunt for haddocks' eyes
Among the heather bright,
And work them into waistcoat-buttons,
In the silent night.
And these I do not sell for gold
Or coin of silver shine
But for a copper half-penny,
And that will purchase nine."

One could almost have furnished two waistcoats for a copper half-penny—no wonder he "seemed distracted with his woe, and rocked his body to and fro." It sound like a fresh version of the "Song of the Shirt" or another facet of the conditions under which match-boxes used to be made.

The patience of the very poor is amazing, and can only be understood by remembering that they cannot afford to be otherwise. Their ingenuity also in fashioning use out of the seemingly unusable is remarkable. Have you ever been to a jumble-sale? I have—there were no bids so I was returned—and some of the things I saw there were so awful that I marvelled—at the patience and ingenuity of the poor and at the impracticable optimism of the donors. One imagines that the original owners must have said: "There is a soiled, worn and useless article; it has been lumbering up my place for years. I really must—no, I'll send it to the jumble-sale. Some poor soul will be glad of it." And by the look of it the said soul would need to be very, very poor to be even the slightest bit glad. Framed texts, old dresses, battered books, derelict shoes, 1890 hats, bronchial bellows, rackets minus the trellis-work, bipedal chairs with lumbagic backs, whatnots and what not—but it all goes, somewhere. Truly, oh *so* truly, has it been said, "It is more blessed to give than to receive"; but the man who lives by haddocks' eyes cannot afford to be a vegetarian.

PERCY FLAGE.

"The Honourable Banana."

(From "*The St. Helen's Reporter.*)

A Chinese schoolboy recently wrote the following essay on the banana. His facts appear to be indisputable! "The banana are great remarkable fruit. He are constructed on the same architectural style as the honourable saugage. Difference being skin of saugage are habitually consumed, while it are not adviceable to eat rapping of banana. Perhaps are also intrissting the following differences between the two objects: Banana are held aloft while consuming; saugage usually left in reclining position. Banana are first green in culler, then gradual turn yellowish. Saugage start out with indeffinit culler (resemble terrier cotta) and retain same hue indeffinitely. Saugage depend for creation upon human being or stuffing machine, while banana are pristine product of honourable mother nature. Both article resemble the other in that neither have pit or colonel of any kind. In case of saugage both conclusions are attached to other saugages; honourable banana on opposite hand are joined on one end to stem; other termination are intirely loose.

"And finally banana are strictly member of vegitable Kingdom, while affiliation of saugage is often undecided."

Courtesy, Accuracy and Speed.

This triple maxim of the past—
Proud watchword of the L.T.S.—
Some latent virtue doth possess
Where'er our lot in life is cast.

Make courtesy your constant aim,
Howe'er beset by verbal strife—
'Twill serve to oil the wheels of life
And earn for you an envied name.

Be accurate—and none will then
Have cause to doubt your slightest word;
But everything by you averred
Will be as Gospel unto men.

Then practise speed. To those distressed
Be swift to lend a helping hand—
To sympathise, and understand—
So shall your path through life be blest.

C. A. S.

Contributions to this column should be addressed: The Editress, "Talk of many Things," *Telegraph and Telephone Journal*, Secretary's Office, G.P.O. (North), London, E.C.1.

CORRESPONDENCE.

TO THE EDITOR OF "THE TELEGRAPH AND TELEPHONE JOURNAL."

SIR,—Lovers of the beautiful will not be envious of "Percy Flage" in his possession of the pipe-rack, "a work of art, which consists of seven heads—monks' heads, to judge by the cowls." He says "the faces are wickedly ugly, and are stated to represent the Seven Deadly Sins."

I would not dare say that the faces are those of the Seven Bishops, the Seven Sleepers, the Seven Wise Men of Greece, or the Seven Champions of Christendom; but the heads certainly do not represent monks' heads, as monks are not wickedly ugly of countenance, any more than supervisors are wickedly ugly, and those monks who bear a cowl—not all do—do not wear that garment *on the head*.

There are numbers of monks in England, and despite their severe mode of life, their looks do not suffer in comparison with their peers of the cultured classes. Some are actually among the handsomest of men; and I have in mind one—the titular Abbot of an ancient Scots foundation—a graduate of Oxford, and a noted author and journalist, who looks what he is in worldly title—a distinguished Scottish Baronet of long and noble lineage.

The Seven Deadly Sins are Capital Vices, in that they are the sources of many other grievous sins; and I hope Camou Flage does not find a resemblance to Percy, in the face of the leader on the left.

The Capital Sins are named in one of to-day's best sellers—a little booklet published by Burns, Oates & Washbourne; but therein one may also find information regarding the beautiful attributes—the principal Virtues, the Seven Gifts, the Eight Beatitudes—the knowledge of which might have an excellent effect on one's pholosophy of life and on one's writings.

The title is "A Catechism of Christian Doctrine," and the price is 2*d*. net.

June 18. FRA ANGELICO.

FOR OUR ADVERTISERS.

Australia, Melbourne, Postmaster-General's Department. July 8. Supply of telephonists' telephones (Ref. B.X. 6352). Also, same Department. Aug. 19. Supply and delivery of telephone jacks (Ref. B.X. 6477). Victorian Railway Commission. July 30. Supply of renewals for caustic soda primary cells (contract No. 43701) (Ref. B.X. 6441). Radio Research, Special Report No. 9 (Department of Scientific and Industrial Research, published by H.M. Stationery Office, price 5*s*. net), reviews the design of radio-receiver amplifiers and includes a general bibliographique of the literature of the subject from 1916 to April 1929. The work has been prepared at the National Physical Laboratory on behalf of the Radio Research Board. The New Zealand Trade Commissioner at Wellington, in his reports, remarks that "British radio manufacturers do not appear to have been very successful in the Dominion, although the trade has grown considerably in the last two or three years." J. J. T.

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WESTERN DISTRICT NOTES.

Rural Automatic Exchanges.—Travellers by road and holiday visitors to rural areas will probably notice, sometimes alongside the open road, and sometimes in a small village or even hamlet, a telephone kiosk in front or by the side of a small brick or stone structure about the size of, and resembling in outward appearance, a private garage. A peep inside the building would disclose the latest thing in rural telephone practice, the R.A.X. (rural automatic exchange).

Within the last year a considerable number of this type of exchange has come into being, and there can be no doubt that they have considerable advantages from the subscriber's and telephoning public's point of view. They afford the best possible grade of service for subscribers during both day and night, and the kiosks (having pre-payment, multi-coin boxes) provide facilities which would not, in other circumstances, be available.

In Devon and Cornwall about a score of these tiny automatic exchanges are either in service or in course of construction, so when visitors from the cities and towns seek their annual repose in quiet country farmsteads let them not be surprised if, after a two-mile walk from the nearest railway station the first thing that meets their gaze on entering by the low doorway is an up-to-date telephone instrument complete with dial.

It is highly probable that the penetration of the most modern type of telephone equipment into rural areas will in time produce an outlook in the minds of the inhabitants that will induce them to feel the need for equally modern lighting, drainage and water systems, as conspicuous at present by their absence. If this prove to be the trend of events, then R.A.X.'s will be able to claim to their credit far more than the rendering of their own particular service.

The following is a letter received from a farmer in one of the remote parts of Cornwall when his telephone was out of order :—

"Dear Sir,

"Our 'phone is dead for last 9 days. I quite understand it has been a gale and will put up with it. But this is the third week since I paid up last.

"The last time a young chap came, he put right in three minutes.

"Two chaps came on Wednesday last—left—said nothing—came in my front gate and left it open, in came my pigs and did considerable damage.

"I suppose it is the same with you as it is with me.

"My workman been with me 28 years—he is Bill Brewer and I am Peter Gurney going on for 80 years old. I can't well do without the 'phone.

"Your attention will oblige

Yours faithfully,

P. G.

The famous Bath and West and Southern Counties Agricultural Show was held this year at Torquay and was visited by H.R.H. Prince of Wales, who arrived by air, landing at Haldon Aerodrome (between Exeter and Torquay).

The show was provided with telephone facilities in the form of kiosks, which proved to be much appreciated by those attending the show, the kiosks being continually in use. The load on the Torquay Exchange on the second day of the show was the heaviest since the installation of the automatic plant a few years ago, considerable use being made of the trunk lines.

A short time ago some motorists apparently spending their holidays by touring "Glorious Devon" decided to try conclusions with one of our telephone poles. We have not heard what happened to the motor exactly, but the Hartland Exchange, in the north-west corner of Devon, was put out of action for 3½ hours.

Miss N. Frood, Writing Assistant in the Registry of the District Manager's Office, resigned after 7 years' service, and was presented by the staff with a handsome oak clock on the occasion of her marriage. Miss Frood was originally at Plymouth, being transferred to Exeter on the formation of the Western District in 1925.

F. J. F.

SECRETARY'S OFFICE GOLFING SOCIETY.

THE annual Spring Meeting of this Society was held on May 30 on the course of the South Herts Golf Club, at which 20 members competed. The result of the Medal and Bogey rounds, played simultaneously in the morning, was a tie at 80 net for the Medal round by Messrs. De G. Gavey and W. H. Smith, the latter also winning the Bogey Competition with 3 down. A spin of the coin to decide the winner of the Medal round for the Captain's prize resulted in favour of Mr. Smith, the Bogey prize going to Mr. Gavey.

The Bogey Foursomes in the afternoon were played under very moist conditions, practically all competitors being wet through. As a result only two of the matches were completed, the winners being Messrs. A. Wakely and H. H. Kilby with 6 down on Bogey.

A BRIEF CHRONOLOGY FOR STUDENTS OF TELEGRAPHS, TELEPHONES AND POSTS.

BY HARRY G. SELLARS.

[*These dates should follow the items for July, 1897, on page 163, and precede those for 1899 on the same page.*]

1897, August ... Popoff established wireless communication between a ship aground 47 kilometres from the mainland and the ice-breaking ship *Ermack*. The installation worked well through snowstorms and bad weather.
Popoff, Ribkine and Troitsky introduced a telephone into a telegraph circuit and found that the signals could be read. Popoff thereupon removed the relay and automatic decoherer from his wireless installation.)
Automatic Wheatstone working introduced on the telegraph line between Odessa and Teheran.
Writing, other than the address, permitted on the face of postcards.
International Postal Union, in Washington, dealt with payment for transit by land and sea.

1897, Oct. 1 ... Scale of charges for connexions with telephone exchanges made £8 to £14, instead of £8 to £10.
Telegrams delivered free up to a distance of three miles from delivery office. For places beyond that distance, 3*d.* a mile charged from the delivery office door. Delivery free at all hours in the metropolitan district.
Automatic telephone system introduced into the United Kingdom by Strowger and exhibited at Winchester House, Old Broad Street, London.
Automatic telephone installation employing primary and secondary switches, and introducing the principle of grouping and trunking, produced by Keith and the brothers Erikson and opened for service at Augusta, California.
Railway letter limit of weight raised to 4 oz.
Regular delivery of letters given to every house in the kingdom.
Imperial Penny Postage scheme introduced.
Contractors commenced using motor vans for conveyance of mails.
Tweedmouth revision of Post Office wages.

1897, Dec. 31 ... Telephone licence for 14 years granted to States of Guernsey.

1898, Jan. 11 ... W. P. Thompson (of Strowger's) patented a dial sending apparatus for automatic telephone working.

1898, Jan. 31 ... New switchboard with accommodation for 150 trunk telephone lines brought into use in the Cable Room, G.P.O. (West), London.

1898, March ... Emile Baudot and M. Montoriol installed the Baudot multiplex telegraph in the Cable Room, General Post Office, London, for communication with Paris.

1898, April 1 ... Long debate in the House of Commons on the question of municipal telephone licences.

1898, May 1 ... Limit of compensation for an Inland registered packet raised to £120. Tariff ranging from 2*d.* for £5 to 1*s.* 2*d.* for £120.
Ballycastle and Rathlin Island connected by a wireless installation.
East Goodwin lightship connected with the shore by wireless telegraphy.
Wireless communication established between Flatholm Island and Lavernock Point.

1898, May 9 ... Select Committee appointed to consider telephone questions and to examine the relative evidence taken in 1895.

1898, May 11 ... Lodge's wireless telegraph with Muirhead automatic transmitter and siphon recorder exhibited at a Royal Society conversazione.

1898, May 17 ... Select Committee on Telephones met, Mr. Hanbury presiding.

1898, June 28 ... Telephone exchange opened at St. Peter Port, Guernsey.
Common battery system introduced in telephone exchanges.

1898, July ... Wireless telegrams sent from a vessel at Kingstown Regatta to the Dublin *Daily Express* by Marconi system.

1898, Aug. 2 ... Government authorised to raise further £1,000,000 for trunk telephone wire purposes.
Wireless telegraphic communication established between Osborne House, Isle of Wight and the royal yacht *Osborne*.
Select Committee on Telephones reported and recommended that the Post Office should establish a telephone service.

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Rovelli constructed an iron filing detector for wireless communication.
Tissot, of France, with a detector of steel filings, exchanged wireless signals between Ouessant and l'Ile Vierge (42 kilometres).

1898, Oct. 1 ... Minimum charge for Telegraph Money Orders reduced to 6*d.* and compulsory repetition abolished.
Konrad Gulstad devised a vibrating relay for high-speed telegraphy.
(E. Lack applied the Gulstad vibrating relay principle to the Post Office standard relay.
Using a Gulstad relay adjusted to give a standard rate of vibration, Bille dispensed with correcting mechanism and special segments on multiplex distributors.)
Slingo's Telegraphists' School of Science closed.

1898, Nov. 1 ... Telegraph Money Order service instituted with Germany with fees fixed at 2*d.* in excess of ordinary foreign money orders, in addition to the charges for the telegram.
Sir William Crookes, an authority on electrical matters, became President of the British Association.
Colonial Penny Postage established.
Customs charges on parcels going abroad paid by the sender.
Official redirection of letters undertaken after 12 months for a fee of one guinea a year.

1899, Jan. 1 ... Great Britain accepted the Postal Union Insurance Agreement. Letters for certain foreign countries insurable up to £120, with fees 5*d.* for the first £12 and 2½*d.* for each additional £12, registration being included.
Limit of compensation in the British Office for parcels to colonies and foreign countries (except France and Spain) fixed at £1.

1899, Feb. 12 ... Express delivery of letters on Sundays introduced in London.
Rowland devised a multiplex telegraph system with duplex balance, synchronous motors for distributors, typewriter keyboard perforators and page printing receivers.
Donald Murray constructed a typewriter keyboard tape perforator punching a five-unit code. His receiving perforator punched tape similar to that used for transmitting, and this was run through a printer of typewriter design.
(Western Electric Company produced (*a*) a five-unit keyboard perforator for use with their multiplex telegraph system, (*b*) a typewriter keyboard, typewheel printing telegraph for short lines, and (*c*) a telegraph printer in which the whole of the type unit moves across the page as printing proceeds.
Dr. Louis M. Potts, of U.S.A., devised a perforated page transmitting multiplex telegraph system, and, in his telegraph receiver, arranged mechanically for simultaneous printing and re-perforating.
Meray Horvath invented a method for switching the perforator out when only the printer is required in a combined Baudot printer-perforator telegraph system.
T. B. Caswell, Sacco and Giacomini devised telegraph type printers.
Pollak and Virag introduced a telegraph system with keyboard perforator and automatic transmitter. The perforator tape had six rows of holes of different sizes and in different positions which passed to line three different current strengths of each polarity. The received currents actuated a small mirror which reflected a beam of light producing written words on a photographic paper tape which was afterwards developed and fixed.
Siemens produced an automatic, duplex, five-unit, printing telegraph, with keyboard perforators.
Forbes, a retired Scottish schoolmaster, constructed a five-unit printing telegraph apparatus.
H. H. Harrison devised a five-unit printing telegraph on which Baudot or Murray perforated slip can be used.
Automatic Telephone Manufacturing Company constructed a five-key keyboard, typewheel printing, telegraph with a distributor.
Dr. L. M. Potts, S. R. Smith, W. G. Campbell and Dubreuil Frères devised means of locking telegraph keyboards when a signal is set up, so that transmission is assured.
McNab devised a form of automatic telegraph distributor.
A. F. Dixon devised a means of providing a start-stop system of telegraphy between a central office and a number of small offices, whereby distributors at the small offices were dispensed with.)
Kirk Himrod invented an electrical translator for use in connexion with typewheel telegraph printing apparatus. To store telegraph signals, Himrod used two sets of relays which were connected to line alternately. Siemens and Halske adopted this method in their automatic high-speed printing telegraph.
(P. Rainey used two groups of storing relays on single channel telegraph circuits to obviate loss of line time.
Ehrhardt, of Siemens and Halske, indicated a means of using condensers for storing telegraph letter signals.
Rainey invented a rotary repeater for multiplex telegraph installations.
J. Hume Bell introduced a rotary repeater for quadruple multiplex telegraph circuits.
Benjamin and Pfannenstiel designed a transmitter for the five-unit telegraph code.
Geneva introduced mechanism for producing intermittent rotation in one direction, which has been used for paper feeding on telegraph tape printers.)

1899, March ... Murray automatic typeprinting telegraph exhibited in New York.

1899, Mar. 6 ... House of Commons agreed that it was expedient to authorise expenditure of two million pounds for the improvement of telephonic communication.

1899, Mar. 9 ... Government Telephone Bill read for the first time in the House of Commons.

1899, Mar. 27 ... South Foreland, Kent, communicated with Boulogne-sur-Mer by wireless telegraphy.
85 miles of sea covered successfully by wireless telegraphy during naval manœuvres.
Wireless telegraphy first used for military purposes in the South African war.

1899, April ... Report of Royal Commission appointed in 1896 to discuss All-British Canada-Australia cable made public.

1899, May 8 ... Treasury minute laid down principles on which telephone licences could be granted to municipalities, and announced that a Post Office system would be established in London. Loan of £2,000,000 authorised for telephone purposes of the Postmaster-General.
Erskine-Murray made experiments in long-wave directional wireless transmission.
(H. H. Beverage, of U.S.A., devised an earthed aerial for directional wireless reception.
Feddersen used an aerial consisting of a vertical jet of water expelled through a metal pipe wound spirally.)
Blondel, Ferrié, Jegou and Meunier, of France, devised various kinds of wireless detectors. Ferrieé also introduced a wave-meter. Carpentier and Ferrié invented a frequency-meter.
H.M.S. *Egeria* surveyed the Pacific cable route between Vancouver and Fanning Island.

1899, July 4 ... Joseph Chamberlain, at a conference held at the Treasury, said: "The Home Government must insist that the route the whole way between this country and Australia should be absolutely 'All-British.'"
Volta's original electrical apparatus destroyed by fire at Como.

1899, July 17 ... H. Bremer patented the incorporation of arc lamp carbon with the fluorides of magnesium, barium, calcium, &c., for the purpose of varying the tint of the light and of increasing the luminous efficiency.

1899, Aug. 6 ... Robert Wilhelm Bunsen died.

1899, Aug. 9 ... Government Telephone Bill—much amended—received Royal Assent.

1899, Sept. 26 ... Conditions laid down as to number of subscribers justifying intercommunication, and the levying of terminal fees.
Hughes duplex telegraph installed between London and Frankfurt-on-Main, Emden and Magdeburg.
American Bell Telephone Company merged with the American Telephone and Telegraph Company.
British Post Office purchased a number of Creed's keyboard perforators.
Post Office commenced laying an extensive underground system of telephone lines in London.

1899, Dec. ... Dr. Michael Idvorsky Pupin, of New York, patented a "loading coil" for telephone circuits on which he had been experimenting since 1895.
Uniform rates of postage for parcels to certain British Colonies introduced. Tariff from 1*s.* for 3 lb. to 3*s.* for 11 lb.
Rates of charges for some foreign countries made on similar lines and in some cases reduced.
Telegraph Money Order service extended to Austria Hungary, Belgium, Holland, Luxemburg, Norway, Roumania and Switzerland.

[*Here follow the items for* 1899 *and* 1900 *on page* 163.]

(*To be continued.*)

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THE

Telegraph and Telephone Journal.

VOL. XVI. AUGUST, 1930. No. 185.

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Subscription: To the public, 5s. 0d. per annum, including postage. To the Staff, 3s., including free delivery to any Post, Telegraph, or Telephone Office. Single Copies: To the Public, 4d. each, or post free 5d. To the Staff, 3d. each. Orders should be sent to the Managing Editor, TELEGRAPH AND TELEPHONE JOURNAL, *G.P.O. North, London, E.C.*1.

All correspondence relating to advertisements should be addressed to MESSRS. SELLS, LTD., 168, *Fleet Street, London, E.C.*4.

TELEGRAPH AND TELEPHONE MEN AND WOMEN.

LXXVII.

MR. D. J. BARNES.

THE subject of our sketch, Mr. D. J. Barnes, first made a name for himself in the telephone world at Brighton, in those stirring days when the Corporation ran a telephone exchange system of their own in opposition to that of the National Telephone Company. This system was purchased by the Post Office in 1907, when Mr. Barnes entered the service of the State with the rank of Assistant Superintendent. Since the acquisition of the National Company's system by the Post Office on Dec. 31, 1911, Mr. Barnes has occupied the position of District Manager of Telephones in different parts of the country, North, South and Midland. Beginning at Bradford in 1912, he was transferred to Blackburn in 1914, to Guildford in 1915, and to York in 1920. At York he stayed over eight years, and during his period of management the York and Lincoln districts were amalgamated, and the number of telephones in the combined districts rose from 13,000 to over 22,000.

Mr. Barnes was transferred in 1928 to the more important district of Nottingham, where he is still in charge. He is a genial personality, fighting in recent years against bad health, but yet ever cheerful and possessed of a vein of quick humour which eases the strain of official life.

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The Telegraph and Telephone Journal.

PUBLISHED MONTHLY IN THE INTERESTS OF THE TELEGRAPH AND TELEPHONE SERVICE, UNDER THE PATRONAGE OF THE POSTMASTER-GENERAL.

Editing and Organising Committee - - - Lieut.-Col. A. A. JAYNE. J. STUART JONES. W. D. SHARP. W. H. U. NAPIER. J. W. WISSENDEN.

Managing Editor - - W. H. GUNSTON.

NOTICES.

As the object of the JOURNAL *is the interchange of information on all subjects affecting the Telegraph and Telephone Service, the Managing Editor will be glad to consider contributions, and all communications together with photographs, diagrams, or other illustrations, should be addressed to him at the G.P.O. North, London, E.C.*1. *The Managing Editor will not be responsible for any manuscripts which he finds himself unable to use, but he will take the utmost care to return such manuscripts as promptly as possible. Photographs illustrating accepted articles will be returned if desired.*

VOL. XVI. AUGUST, 1930. No. 185.

ECONOMIC RESEARCH.

WE gather from a report in a provincial journal that in one of a series of pamphlets on "Progress and Plenty," issued by the Pollak Foundation for Economic Research of Newton, Massachusetts, Mr. Robert Caldwell, of New York, delivers himself as follows:—

> "Until Europe installs modern automatic dial telephones she might as well give up the fight. The odds against her are too great. In New York I commonly get a telephone connexion in one-fourth of a minute. In Europe half an hour is not uncommon, and then it is all but impossible to hear on their ancient devices in use. America will take any world trade she goes after against Europe while Europe permits herself to be so handicapped."

This, of course, reads more like the outpouring of some free lance journalist of the more irresponsible sort than the considered opinion of the author of a paper issued in the interests of economic research. We do not know Mr. Cardwell, nor have we any information of the standing of the Pollak Foundation. We can only deduce from this specimen that its pamphlets on Progress and Plenty are plenteous in misstatement and progressive in erroneous deduction. The author's remarks on European telephone service are those of a traveller who, still nursing a grievance born of slow telephone service endured in some backward European town, returns home to compare its conditions with those of New York. His observations on the development of the automatic system are equally dispassionate and well informed. His attitude is precisely that of the guileless person who, having found the dial system working in some foreign town, writes to the papers saying "Why don't we have the automatic telephone in England?" We know him of old, but we had never hitherto regarded him in the light of an economic researcher.

From the first sentence we have quoted the uninstructed reader would imagine there were few, if any, automatic telephones in Europe, whilst in America they were, if not universal, at least in a majority. The fact is that while in both continents the automatic system is well established or in process of introduction in most of the principal cities, the manual system is nevertheless still largely predominant. In the United States 26% of the telephones owned by the Bell Company's system are working on the dial principle. In the British Post Office system the percentage is over 22. We cannot give the percentage for France, Germany and other leading European States; we only know that the same process of change is going on.

If Mr. Caldwell's premises are wrong, what becomes of his deduction. What reliance is to be placed in his statement that he obtains connexion in New York in a quarter of a minute? The time for obtaining a subscriber in London, taking the average over long junction lines and short ones, is 38.5 seconds. This is a recorded average. We know that the New York service is most efficient, but we do not know if the figure quoted is a conjecture or the impression of a slipshod mind. Mr. Caldwell may even be comparing a New York local call with a European trunk call.

Our apology for referring at some length to an unimportant document is that it affords us an opportunity of rebutting a frequently expressed erroneous impression of the development of automatic telephony in this country.

HIC ET UBIQUE.

WE have received a copy of an attractively printed booklet which Messrs. Joseph Lucas, Ltd., of Birmingham, have issued to their staff. It is entitled, "Helping the Telephone to fulfil its Function." It is correctly described as "issued in the interests of everybody," and lays down some sound rules for the guidance of the general telephone user. It pours proper scorn on what it describes as the "ping pong" method of question and reply—the "Hello," "Hello," "Yes," "Who are you?" "Whom do you want?" cycle of enquiries. Some good mottoes appear in the book such as "Don't make a mystery of your identity," "Visualise the person at the other end of the line," "Help to make telephoning a pleasure," and so on. It is certainly an effort to be recommended for imitation.

We borrow from our "wireless" contemporary, *The Signal*, which in turn has lifted it from a New Zealand paper, the following:—

> A story is told of a member of a certain organisation who forgot to pay his subscriptions thereto, and one day in the forest whilst on leave a terrible storm arose. An accommodating hollow log which just fitted his body almost proved his undoing, for after many hours' rain the swollen log held him fast so that he could not get out and he was thus faced with death by starvation. In a state of panic all the omissions and commissions of his past life flashed before his mind when suddenly he remembered he had not paid his association subscriptions. This made him feel so small that he was able to release himself and thus save his life.

We are not sure, however, that this is not an argument in favour of dilatory payment of one's subscriptions.

"New York City," says *The World To-day*, "now has as many telephones as all Great Britain, and Chicago has as many as France." Both these statements are incorrect. The first is 75,000 out.

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A genial contemporary, referring to the British Post Office, says: "Details as to the numbers of new subscribers are readily proclaimed. No particulars as to the number giving up lines would seem to be available.

If the suggestion is that published figures of the increase of telephone stations take no account of "ceased subscribers," it is quite erroneous. The figures represent net growth. There is nothing of particular interest to the public in the number of subscribers who discontinue owing to death, failure or removal to other addresses. This last factor accounts for a considerable number of apparent "ceasements." Our contemporary would probably be surprised to learn that while in 6 months recently in New York 120,000 new telephones were connected, no less than 90,000 were disconnected—most of them due to removals.

The following description from the *Manchester Guardian* of how the Test Matches are "watched" at Manchester will be found of more than passing interest:—

Hundreds of Manchester men were able to "watch" the Test Match to-day on the Flat-iron Market by Blackfriars Street. The scoreboard erected there by the "Johnnie Walker" whisky company is a miracle of ingenuity. Against a background of green, with a white oval ring painted round it, and two wickets in the middle, a white ball suspended by wires moves down the "pitch" as the bowler delivers it as far as a coloured tab which represents the batsman, and thence over the "field" in the direction of his hit. If a run is scored, the coloured tabs at either end of the pitch change places. The batsmen's scores are indicated in the usual way, and other tables show who is bowling and what fieldsman stops each hit.

The secret of the machine is continuous communication by telephone with observers at Trent Bridge. Five men are needed to work it. The resulting spectacle is extraordinarily exciting. The crowd at the Flat-iron Market cheered Chapman's lusty drives and Hobbs's discreet cuts as enthusiastically as if they had been at the ringside. With some knowledge of the batsmen and bowlers engaged it is possible to envisage the kind of ball bowled and the stroke made at it. But, of course, one cannot guess anything of the quality of the play. The interest is purely statistical, though the statistics are shown in visual form, like diagrams.

One point which the machine brought home was the amount of time spent between one over and the next.

For the sake of variety we hail the new caption brought forth by the *Evening World* apropos of the introduction of automatic working at Bristol. Instead of the usual "Hullo Girls Doomed" we get "Wrong Numbers Doomed!" By an effort of genius the inventor of the phrase manages to combine the journalists' "wrong number" complex with the prevailing idea of someone or something being doomed when an automatic exchange is opened.

We clip the following testimonial from the *Essex Weekly News*:—

SIR,—When we read so much abuse of the Post Office, it may be of interest to your readers to know how smart the telephone authorities are to create new business.

We were surprised to have a representative call and state that a check had been kept on our two telephone lines at Harold Wood Ingrebourne No.'s 84 85, and it was found that 14 customers had tried to get through but the line was engaged. Not only did they give the number, but they had got the names of the callers, so there could be no shadow of doubt.

Result:—We were so impressed and immediately agreed to have an extra line, making 3, and really we cannot help but feel that it was very smart on the part of the telephone authorities in showing that they are looking after their job, and we personally are glad, as otherwise we should not have known our need of another line.—Yours faithfully,

For James & Geo. H. Matthews, Ltd.,
GEO. H. MATTHEWS, Director.

Harold Wood, July 1.

Contract Officers who have not already seen it may like to digest the following paragraph from the *Daily Express*:—

This is the story of a voice—a voice called Extension 123.

Every day hundreds of people ring up City 2040 and ask for Extension 123 in tones ranging from the more or less calm to the frankly agitated.

"Yes, sir?" or "Yes, madam?" says Extension 123.

"I want to sell my piano quickly," answers the caller, or else, "My cook has left me in the lurch," or else, "The landlord has given me notice and I must find another flat at once."

Promptly and soothingly Extension 123—who, with her colleagues, comprises the Small-ad. Department of the *Evening Standard*—assures the callers than an advertisement announcing their requirements will appear in that day's paper. If they desire it, Extension 123 drafts the advertisement herself. Then, having read it over to them, she sends it to the printer. . . .

The *Evening Standard* is the only newspaper that will accept telephoned Small-ads. up to 1.30 p.m. *for publication on the same day.*

Keep City 2040 (Extension 123) in mind, and next time the parlourmaid gives notice you will be able to say with baffling nonchalance, "Very well, Jenkins. Kindly pass the telephone."

The new Central Battery Telephone Exchange equipment at Hastings, Sussex, was successfully brought into operation on Monday, July 14. This exchange, which was manufactured and installed by Standard Telephones and Cables, Ltd., has been designed to accommodate 3,600 lines initially, with an ultimate capacity of 7,400 lines.

THE TELEPHONE AS LOVE INDEX.

BY OSSIP DYMOW.

(A feuilleton in a Swiss contemporary.)

IN the street I met the young daughter of my old friend "Why this sad countenance?" I asked. "He loves me no longer," she answered, with an expression which a film star might have envied.

"Why do you think that?"

"He is no longer interested in me. He doesn't even find time to telephone to me. It's all quite clear."

I could not counter this last argument. Not to telephone her! Well, well!

In the Spring I met her again. Her eighteen-year-old eyes shone, her movements were gracious, an unconscious smile played about her lips. "All is right," she called out. "I am happy. He loves me—Oh, how he loves me! At present he is not in Berlin he is spending his holidays at Buchholz."

"Oh, in Buchholz?"

"It appears he was ill last winter and therefore could not telephone me. But he rings me up from Buchholz every morning as soon as I open my eyes. Often he telephones me twice—and three times on Sundays!"

"That is very nice of him. And whereabouts is this Buchholz?"

"Somewhere far away in the South—in Baden, I think. But I know one thing for certain—a telephone call from there costs three shillings for three minutes! On Saturday we talked for 23 minutes! On Thursday for 18. And so it is every day. Oh, how he loves me!"

One evening in the autumn I saw her again in the entrance of a cinema. She was accompanied by a good-looking youth. I whispered to her: "He is certainly a charming young man. I'm very pleased."

She answered disdainfully: "But that's Karl—another one. The one I spoke to you about has turned out quite a shameless deceiver."

"How is that?"

"It appears that he was not at the Buchholz I imagined, but at a different one altogether. It was quite close to Berlin, not in the South at all, and a telephone call from there only costs three-halfpence! A fine heroic deed to telephone for a few pence! And twice on Sundays! Mean wretch!" And she added, in soft tones: "Karl has promised to ring me up from Paris!"

W. H. G.

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THE DEVELOPMENT OF THE ADVISORY SIDE OF CONTRACT WORK.

BY "SHERWOOD."

WITH the adoption of the automatic system there are certain aspects of contract work which take on an added importance. I propose to deal mainly with the holding time on calls and its possible reduction by the scientific arrangement of medium size P.B.X. installations, to the mutual advantage of subscribers and the Department. At the present time additions are made to an installation without reference to the possible effect on its general efficiency, and unwieldy arrangements of poor efficiency are bound to result.

If maximum efficiency is to be attained, every P.B.X. installation must be regarded not only as a detached unit of the main exchange, but also as an entity in itself. This fact involves, as a prime consideration, that the general arrangement of the installation should be left with the Department. The first point therefore to be aimed at is to gain the confidence of subscribers and induce them to place the whole of their telephone arrangements in the hands of a specialist.

Let us consider what advantages would accrue to the subscriber in the event of his agreeing to this proposition :—

(*a*) Disposition of the instruments in the most convenient position for answering and operating.

(*b*) Particular exigencies of the subscriber's business, or premises, catered for in the best possible way.

(*c*) Reduction in lost calls and speedier intercommunication.

(*d*) Extended use of parallel extensions, affording an expeditious means of handling enquiries at an alternative point where either point is not constantly staffed.

(*e*) Full data as to subscriber's probable future requirements would enable a comprehensive and flexible scheme to be drafted at the outset and additions made in pre-determined positions.

(*f*) Satisfaction that he was getting the maximum facilities for his expenditure.

Turning to the advantages from the Department's point of view, these may be summarised as :—

(*a*) Reduction in the holding time on calls.

(*b*) Reduction in Busy Tone cases.

(*c*) More accurate data for development purposes.

(*d*) Retention of smaller P.B.X's often made possible by taking full advantage of parallel extension facilities.

(*e*) Position of instruments can be definitely chosen with a view to ease of wiring and allowance made for additions in pre-determined positions.

(*f*) Installations can be graded in efficiency and canvassing prospects.

To explore the subject a little further, it is obvious that the rate of working at any P.B.X. is dependent on the extension points being in the most suitable position for attention. Thus a compact and skilfully arranged scheme will result in much higher efficiency than a haphazard disposition built up to meet the demands of the moment.

The fact that the provision of additional facilities alone will not necessarily solve a subscriber's telephone problems, and that only by instant response to calls can he obtain the full benefits of the service, is one that should be constantly pressed. This point leads to one of the main items in these suggestions, i.e., the reduction of holding time.

As any technician is aware, trunks, or connecting circuits between switches, are graded, i.e., are arranged on a mathematical basis to carry traffic, as near as possible, to the limit of their capacity. The number of switches is also dependent on the maximum traffic requirements during the peak period. The switches used in a normal call are the 1st code, group, and final selectors, together with the director used for routing the call, plus the trunk circuits involved, and possibly a junction with other selectors. On a busy call all this apparatus and associated circuits is taken into use and held for a definite time, during which period its revenue earning capacity is nil. Other subscribers may receive busy-tone at some point in the train owing to the engagement of this apparatus with the resultant loss of remunerative traffic. Such calls form a considerable proportion of the traffic for which provision has to be made in traffic and exchange equipment arrangements.

As the release time of a switch may be reckoned in fractions of a second, every second gained in the answering of exchange calls and the early release of the connexion by subscribers enables more effective calls to be completed with the same amount of equipment. If the answering and holding time can be reduced even by a few seconds on a fairly large proportion of calls, the expansion of exchange equipment to meet traffic growth may be restricted. The subscriber is available to receive more calls and the caller does not get the impression that the system is inadequate owing to receipt of the busy-tone.

Reverting to another point, provided that a large number of P.B.X. renters will state their anticipated requirements, say for 12 months, and this information can be co-ordinated with other relative facts, reliable data could be furnished as to the anticipated demand in the several types of switchboard and enable the stocks to be held at a minimum. Reservation of numbers becoming spare, and which could be used to expand groups for auxiliary working, could also often be made, avoiding a change of number later.

Parallel extensions can often be utilised to avoid the fitting, and consequent expense, of a larger switchboard where further development is unlikely. Their use may enable a switchboard of more convenient size to the subscriber to be retained, thus simplifying the work of the operator with less overhead expenditure to the Department.

Grading of installations might be applied in regard to the contract aspect, using say three categories :—

"A"—Additional facilities urgently necessary : action, persistent canvass.

"B"—Early prospect of additions : action, canvass in ..... months.

"C"—No prospect of early development : action, record, canvass in 12 months.

The adoption of this principle would allow some idea of canvassing prospects in definite areas to be obtained.

I need not enlarge upon the other points as they are obvious and subsidiary to the main suggestion.

The question then arises as to how these suggestions might be carried into effect. It is clear that the primary purpose of the Contract Branch is to obtain stations but a very important fact is, that subscribers look on the branch accepting their order as being the advisory section of the service. Admitting this fact, it is obviously desirable that expert technical advice should be available in that branch. Having established the point that the advisory function should be associated with contracts, and as it is obviously impossible that every officer could possess the peculiar qualification. I submit that much might be done by the appointment of a trained advisory specialist in each D.C.M.'s office, whose duties would be primarily of a consultant nature.

Such an officer would require to have an intimate knowledge of contract work and technical qualifications would obviously be

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essential. Opportunities for gaining practical knowledge of P.B.X. layout schemes, wiring of subscriber's premises, various routine tests, traffic, and exchange procedure would be a necessary part of his "specialist" education. A wide knowledge of fixed time, trunk, subscription calls, express, and lesser known services is also desirable, as the type of subscriber with which he is particularly concerned is one to which these services can be of great utility.

The duties which I conceive such an officer would perform would include :—

(1) Visit subscribers, endeavour to gain their confidence and interest them in the points enumerated.
(2) Induce subscribers to consider a reorganisation of their installation where higher efficiency would result, draw up the necessary scheme and give any advice required.
(3) Impress on subscribers the utility of the subsidiary services.
(4) Compile a card index of all installations visited. The cards showing details of subscribers, premises, nature of business, rough sketch of installation, anticipated expansion, whether change of switchboard involved and when, efficiency of installation, grade in canvassing prospects and any other useful information.
(5) When card matures for attention pass to relative section for canvass in the normal way.
(6) Prepare half-yearly returns for development and traffic data.

The card index system would result in a valuable record being gradually compiled, and by periodical visits kept up to date in the main essentials of the type of P.B.X., probable development, efficiency of system and canvassing possibilities.

The subject of advisory work is a wide one, but I believe that its development on the right lines, with the constant application of the "personal interest touch," would remove much of the misconception which exists in the minds of the telephone public and bring about a wider appreciation of the Service and of the amenities it provides.

TELEGRAPHIC MEMORABILIA.

A COPY of the evidence tendered to His Majesty's Royal Commission on the Civil Service on behalf of the Overseas Telegraph Superintending Officers' Association has reached me, for which I would wish to thank the unknown sender. Although this is neither the place nor occasion for a review of such a document, one cannot refrain from recording one's personal and experienced opinion that never yet has the case for the Government Foreign Telegraph Service been better presented.

Judging from comments and an article in the *South African Postal and Telegraph Herald*, entitled "The Humour of Machine Telegraphy," it would appear that the S.A. authorities have also found that the mechanisation of the Telegraph Service is not without its own particular difficulties. However good a machine may be it is no better than the *human* touch, in that it is not infallible, and therefore when the fallibility of the human *touch* of a telegraphist is added to the fallibility of a machine, plus the recognised super-fallibility of overhead lines in tropical or sub-tropical parts of the globe, it is no doubt true that, "by the mere clipping of a dash, the dropping of an impulse, the running of a mark and many other runs, clips and dots, the sale of 1,000 bags of mealies at 12*s*. 6*d*. instead of 14*s*. 6*d*." is more likely than not to bring down the wrath of any distracted merchant. The South African writer is, however, scarcely just to the makers of machine telegraph apparatus when he quotes an experience of "the good old days"—not unknown much nearer home—when, "if a good telegraphist got approximately 50% of the dots and dashes in any one telegram he was quite capable of completing that telegram out of his imagination." Speed is the keynote of successful modern telegraphy, and neither machine nor hand telegraphy can deliver the goods with the necessary celerity and accuracy if conductors are below a reasonable electrical standard. Speed has to be paid for in many ways; on the high roads or in our daily press, where the typographic errors, due to rushing out first editions, are much more evident than they were 30 or 40 years ago. Telegraphy is not, cannot expect to be, immune. The Head Postmaster of Neath, in *St. Martins Magazine*, quotes a case where a telegram reached him as "Dead Postmaster Neath," and our friend S. W. B. assures us all that it is not true and that, like Mark Twain, the rumour of his decease has been very much exaggerated! Telephony? Was it not in a phonogram that "Postmans Park" was recorded in the address of a message for the Continent, instead of "Poste Restante"? *Inter alia*, it should be mentioned, for the information of our South African colleagues, that owing to heavy telegraph traffic the Great Western Railway Company's engineers are installing teleprinters on their London—Swindon lines, each capable of dealing with 60 telegrams per hour.

However, in case it should be thought that the writer has not yet awakened to the strides which telephony has made, is making, and is yet to make, as against the slower progress of an older industry, let me quote the following comparative figures regarding "Telephony versus Telegraphy," from statistics published by the American T. and T. Company :—

Country.	*Telegrams per Head per Year.*	*Telephone Conversations per Head per Year.*
Canada	0.3	241
U.S.A.	1.9	230.7
New Zealand	4.7	209.1
Denmark	0.6	143.5
Japan	0.7	56
Germany	0.5	38.1
Great Britain	1.2	30.6

Companies.—Great Northern Telegraph Co.'s Holding Co., Ltd.,—total dividend for second financial year 20%. Anglo-American Tel. Co.—interim dividend, quarter June 30, 15*s*. per cent. ordinary, less tax. W. Union—quarterly dividend Comm. stock $2 per share. Telephone Construction & Maintenance Co.—interim dividend 2½%. W. T. Henley's Tel. Works Co.—final dividend 12½% ordinary, plus bonus 10%. Total for year 30%. Carried forward £572,630.

Obituaries.—The death of Sir Joseph Ward, ex-Premier of New Zealand, last month was received with the deepest regret in this country, and not least by those in telegraph circles, where, it is recalled, the first job of this statesman was that of a telegraph messenger. Strange to relate, in the same issue of my daily paper's Stop Press containing the brief statement of his passing, there appeared an ordinary cablegram announcing that Sir Joseph was engaged in formulating a scheme for the improvement of the telegraph and telephone services (see below under NEW ZEALAND).

The first mechanic to be associated with the commercial development of wireless telegraphy passed away on June 14 last, in the person of Mr. Jack Cave, in his 58th year. This much respected master instrument maker, whose special knowledge of the technique of glass blowing led to his appointment in 1897 to the personal research staff of Marchese Marconi, was, among other qualities, noted, even in the early days of the coherer, for a very high degree of precision and the general high standard of his work.

ARGENTINA.—The Direccion General de Correos y Telegrafos informs us that the telegraph system at the end of 1929 had reached a line-length of 75,625 miles. 700,000 poles are used to carry this network, and are nearly all made from native-grown trees. During the present year the construction of a large number of new lines is being undertaken, extending to all parts of the country. Telegraph communication with the southern part of the country will be given preference, in order to relieve pressure on the international line, which at present handles most of the southern traffic. A new telegraph line is proposed that will join Bio Bio,

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thus reducing the traffic over the international line by 50%. BELGIUM.—The Senate recently passed the Government Bill authorising the setting up of autonomous control of the telegraph and telephone services hitherto administered by the State. CHINA.—The shareholders of the Shanghai Mutual Telephone Co. have agreed to sell their undertaking to the International Telephone and Telegraph Corporation. The company serves about 36,000 subscribers in the settlements. Later news published by the *Electrician* and *The Electrical Review* as we go to press throws some cold water on the scheme by the statement that "The Chinese Telephone Subscribers' Association has warned the I.T. & T. Corpn. that the purchase will result in a boycott." CZECHO-SLOVAKIA.—The Ministry of Posts and Telegraphs is erecting in Prag a building which will be the headquarters of broadcasting in Czecho-Slovakia. The new national broadcasting station, which is under construction near Cesky Brod, east of Prag, will be of 60/120 kw. At first the communication with the Prag studio will be by wireless, but eventually an underground cable will be the permanent arrangement. Tests are to take place early in 1931. About 25% of the country's population utilises the service. 67% of these use crystal sets. EAST AFRICA.—The Portuguese Marconi Co. have petitioned the Minister of Colonies for the installation of a wireless central station at Beira (East Africa), thus making possible direct communication with Lisbon, says Reuter's Agency. GREAT BRITAIN.—At the sixth plenary session of the Colonial Office Conference in London the submarine cable and wireless telegraphy services received special attention. On this occasion it was announced that Imperial and International Communications, Ltd., says *The Electrical Review*, had submitted a comprehensive scheme for the organisation of the cable service throughout the Colonial Empire. The scheme had not yet been considered; before any definite decision could be reached it would have to be referred to the Colonial Governments. It was recommended that the scheme should not be considered piecemeal, but as a whole. On behalf of the Post Office it was stated, continues the *Review*, that after much experience the conclusion had been reached that for long distance services of over 2,000 miles wireless was distinctly cheaper than cables, but certainly not so efficient. With cable services a 24-hours per day service could be kept up, but that was not the case with short-wave wireless. *Broadcasting.*—It is reported by the *Electrician* that as soon as permission is obtained from the Post Office the erection of the Scottish regional broadcasting station will be commenced at Falkirk. When it is completed the stations at Glasgow, Edinburgh and Dundee will close down. It is possible that the Aberdeen transmitter will remain in commission. The third annual report (1929) of the B.B.C. states that the problems in connexion with the provision of a regular Empire broadcasting service have been considered in detail and that a full review—technical, character of programmes, times of same, probable overseas response and cost—was submitted to the Government near the end of last year. Marconi's short-wave station at Chelmsford (G5SW) had done good experimental work in relaying programmes for the benefit of overseas listeners. This should be of great use in the establishment of a 24-hour Empire service. The crux at the moment, so one gathers, is, who shall pay for the service? *I.E.E. Wiring Regulations, Radio-receiving and Valve-amplifying Apparatus.*—A revised supplement to the ninth edition of the I.E.E. Regulations for the Electrical Equipment of Buildings has been issued, and copies may be obtained, free of charge, on application to the Secretary of the I.E.E., Savoy Place, London, W.C. This is in substitution of the corresponding supplement of June, 1928, regarding radio apparatus. GERMANY.—The German State Broadcasting Company has just lost a case in which it claimed copyright for its news services on the ground that *part* of the news had already appeared in the Press. INDIA.—*Broadcasting Advisory Committee.* The personnel of the new Indian Central Broadcasting Advisory Committee was gazetted on June 14. It will consist of the member of the Government of India for Industries and Labour (Sir J. W. Bhore), who will be Chairman, says the *Times*; two officials from that department; two non-official Indian Members of the Legislative Assembly from Bombay and Calcutta respectively; and two non-official Englishmen from the same cities. The duties of the Committee will be to advise the I. and L. Department, which, it will be recalled, has had charge of the broadcasting service since the State purchased it in March of this year. The small sum of about £20,000 has been allocated for working expenses for the year April 1 to Mar. 31, 1931. At the moment there are less than 10,000 licenceholders. IRISH FREE STATE.—*Telegraph Traffic still declining.*—The telegraph traffic still continues to decline, says an official statement. The estimated number of telegrams, excluding Press messages, originating in the I.F.S. last year was 2,069,000, compared with 2,411,000 during the previous year. The expenses of the service had, however, been curtailed considerably. After a full investigation the Department was satisfied that the increased minimum charge imposed in August, 1928, had resulted in a saving in the cost of the service. The volume of traffic, it is added, compares favourably with that in many other countries. ITALY.—The Italian Broadcasting Company, according to *The Electrical Review*, has caused to be erected near Rome what is probably at the moment a "last-word" short-wave station, which will enable transmissions to be heard in the Italian Colonies and in overseas countries which are outside the range of the stations operating on the normal broadcast wave-band. The new station was manufactured at Chelmsford by Marconi's Wireless Telegraph Co., Ltd. The wave range of the transmitter is from 25 to 80 metres, provision being made for readily changing over from one wavelength to another. There are four panels, the first contains the main magnifier operative over the whole wave-band of 25 to 80 metres, the second contains the intermediate magnifier and drive units for the wave-band of 25 to 40 metres, the third comprises the intermediate magnifier unit and drive units for the wave-band of 40 to 80 metres, the fourth being the modulator and sub-modulator unit. Mr. C. S. Franklin, the well-known expert, is responsible, it is understood, for the special two separate transmitting aerials. Speech and music received from the Rome studio over the land lines will be amplified by two separate speech amplifiers, to bring it up to a sufficient level to modulate the transmitter fully. NEW ZEALAND.—One of the last acts of the late and much lamented Sir Joseph Ward was to signify his intention of establishing a commercial branch of the Post and Telegraph Department. Active salesmanship was to take the place of waiting for orders in the State's telephone service. New Zealand has now a density of 10.2 per 100 inhabitants, as against 3.8 per 100 telephones in Great Britain. PORTUGAL.—A credit of 24,000,000 escudos (about £230,000) has been granted for extending and remodelling urban and inter-urban telegraph and telephone lines and the installation of radio stations, says Reuter's Lisbon Agency. RUMANIA.—A month ago the *Times* reported that the contract between the Roumanian Ministries of Public Works and Finance and the I.T. and Telegraph Co. had been confirmed. The contract gives the company a monopoly of the Rumanian public telephone system, for which it is to pay about £980,000. In addition, the company is to arrange loans totalling £1,646,000 for the Rumanian Government. The State reserves the right to repurchase the system after 20 years. SIAM.—As the telegraph lines down the Peninsular are subject to considerable interruption, the Chambers of Commerce of both Siam and British Malaya are trying to get wireless communication established between Bangkok and Singapore, or Bangkok and Penang, says information through Reuter's Bangkok Agency. The scheme has the strong support of the Siamese Government, but so far the Straits Settlements Government has not seen its way to agree to take the necessary steps. The proposal remains under consideration. It is, however, announced that whenever there is an interruption of the land lines of more than one hour, urgent telegrams (at triple rate) will be sent by wireless! SOUTH AFRICA.—For additions to and extensions of the telegraph and telephone systems £600,000 will be spent during the next year, of which £150,000, says *The Electrical Review*, will be for farmers' lines. The plans include an extensive programme for the installation of automatic telephone exchanges. SOUTH AMERICA.—*German Cable and Radio Traffic.*—At the annual meeting of the German-Atlantic Telegraph Company it was mentioned that the Company's participation in the Compania Telegrafico-Telefonica del Plata had recently been disposed of to the Siemens & Halske Co. The

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arrangements made by the latter would guarantee to German cable and radio traffic a connexion with the telephone and telegraph company in South America, which is worked by the Siemens group. U.S.A.—Should any of our British telephonists or telegraphists in the course of their meanderings through American literature light upon the letters "D.O.D.," following the name of a lady or gentleman, it may be useful to know beforehand that these letters signify "Doctor of Dials," and that this new degree is to be associated with automatic telephony. Thus we read that "The degree of D.O.D. was conferred on Geoffrey Proctor Nock, District Traffic Superintendent, of Portland, Oregon, in the Pacific Telephone and Telegraph Co., being Class Instructor of a Dial Management course." Further information records that "the diploma was presented at a dinner by the 'Board of Regents' of the *Universitus Telephonus*." One can only leave so wonderful an innovation to the pen of our much-admired "Percy Flage," who will surely prove most competent to deal with the D.O.D. degree! It is stated through Reuter's New York Agency that a regular photo-radio service is to supplement—not to supplant—existing ship newspapers on the U.S.A. liner *America*. The apparatus is expected to be effective up to about 3,500 miles. *More Internal Telegraph Competition for the U.S.A.*—An extension of the operations of the Radio Corporation of America was forecast by General J. G. Harbord, its president, who stated that plans have been made for the immediate establishment by the Corporation of "a domestic wireless system to serve the U.S. through stations in 14 strategic cities, the number to be increased later." The system is to compete with leading telegraph companies. The recent grant of ten exclusive wireless channels (? wavelengths), with five jointly-shared channels, will be operated by the Radio Corporation's subsidiary concern, Radio Corp. American Communications, Inc., which is expected to act as a United States connexion for the Radio Corporation's service to Europe, South America and the Orient. *The Radio Metropolis.*—This proposal for New York City has now, says *The Electrical Review*, become a definite project, and the clearance of the site is to begin this fall. This new centre is to be completed by 1933, and is the joint project of the Radio Corporation of America and its subsidiary companies and Mr. J. D. Rockfeller, jun., and is estimated to cost £90,000,000 for land and buildings, according to the *Times*. The latter authority adds that shops will be housed on the ground floor, on the roof a restaurant, &c. On one side of this *metropolis* there will be a 60-storey building containing 27 broadcasting studios, some of them two to three stories high. Four theatres are to be built within this area, all being equipped with broadcasting apparatus. A symphony hall will be added. The Radio Corp. will lease all four theatres and extensive space for office and studio. It is to use the studios and the theatres to provide entertainment for the audiences in them and also for wireless listeners. At the same time they are to be used as experimental stations for the technique of stage production, broadcasting and television.

The *T. and T. Age* states that A. B. Dumont, Chief Engineer of the De Forest Radio Corporation, has asked the Federal Radio Commission for a construction permit for a Television station at Passaic, N.J., using 20,000 watts and operating on 2,000-2,100 kc. Mr. Dumont, in making his application, stated that "television is developing very rapidly and no one can tell what will happen within the next six months." (Quite true!) The De Forest Corporation has joined forces with the Jenkin Television Corporation, which has already spent more than $500,000 in experimental work at Passaic.

South Carolina is the first American State to levy a tax upon wireless receivers. The tax amounts to 50 cents on sets valued at 50 dollars, increasing *pro rata*, says *The Wireless World*.

Short-Wave Wireless.—We have in the short wireless wave a new problem of extra penetrating power. Nobody knows as yet where its limitations are or what it is destined to reveal. We are like a blind man who has just acquired the use of his fingers and is feeling in the dark.—E. E. Fournier d'Albe.

J. J. T.

THE TOURIST TROPHY RACES AT DOUGLAS, ISLE OF MAN.

BY R. A. DAVID, LIVERPOOL.

ANOTHER T.T. Race week has passed off very successfully. The greatest T.T. ever. Many records have been broken—record speed, record weather, record crowds and record attendance by the Press. These are the headlines given in the Motor Press, but there is very little reference to the records made by the telephone side. I shall, therefore, try to describe what part the telephone plays in this great game; in fact, but for the telephone the race itself would be almost impossible.

Apart from the technical side, the races have another aspect—and one that probably appeals more to the general public than anything else—sport. They embody every condition essential to

[*Reproduced by courtesy of "Motor Cycling."*

FIG. 1.

the ideal sporting contest. Courage, endurance, physical fitness, coolness and superb judgment. To be successful in the T.T. Races a rider must combine all these qualities, and must add to them the technical knowledge that will enable him to extract that last ounce from his machine which may mean success; to forego that extra ounce may bring breakdown and defeat. To see the T.T. is to witness one of the most breathlessly exciting spectacles the human mind can conceive. As each successive machine, with its rider crouching low over the tank, whirls round the course, leaping the hump-backed bridges, twisting up the narrow mountain roads, racing "all out" down the straight stretches, the onlooker unconsciously tenses to the thrills and excitement of it all; feels a lump come into his throat as the favourite hurtles by, still going well with half the last lap completed; knows also that dread anxiety which settles on the silent, watching crowds as the minutes creep by and the leader does not appear. The T.T. Race is beyond description; there is only one way of appreciating the races at

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their true value as one of the outstanding sporting spectacles of modern times, and that is to see them, and it is here that the telephone plays its part to make this race a sporting event for the crowds who attend, and without it very few details regarding the progress of the riders could be obtained.

In the July issue, 1928, of this journal a brief description of the control board is given, also showing points at which the telephones are fitted round the 37½-mile course—see Figs. 1 and 3. At the starting point is a dial, round which are certain initials

[*Reproduced by courtesy of "Motor Cycling."*

FIG. 2.

representing six points on the course. The actual position of these is clearly indicated on a large map displayed by the board—see Fig. 2. When the competitor passes each of these points the hand of the dial is moved round to the letter representing that particular place on the course. Progress of each rider in the race can, therefore, be followed as accurately as though one were actually pursuing him round the island. To accomplish this, telephones are placed at the various points indicated. The circuit is terminated at the Grandstand, at points called North and South Control. Here officials listen with headphones to the Marshal, who report, as each rider passes his point, i.e., "Kirk Michael 16," "Ramsey 25." These are then passed on by telephone to the score indicator boards where there are a number of scouts each listening-in by headphone receivers. They in turn move the indicator to the position of the rider. Again, as each rider reaches Governor's Bridge, a bare half-mile from the finish, his number is 'phoned to the Control Tower and his number on the board lights up, and within a few moments the rider himself appears, either to flash by on another lap or to pull up at his replenishment pit for petrol and oil. There are other points fitted with telephones. These circuits work as emporary exchange lines and are called "Special Information Circuits," and it is from here special reports are received from the Marshals in charge, i.e., at first we get the reports as to the crowds, weather conditions and, as the race proceeds, reports such as "Sulby Corner, No. 20 crashed, rider O.K., machine damaged, not proceeding, Mountain No. 14 has just passed touring." This information is conveyed to the crowds in or about the Grandstand through loudspeakers.

The island offers ideal facilities for this kind of sport, as Douglas out of season can accommodate with ease all those who desire to see the race. The course runs close through many points having permanent telephone routes and direct communication with the Douglas Exchange. The keen interest taken by the local inhabitants results in business being brought almost to a standstill, and in consequence it is possible to utilise a number of junctions to form "The round course circuit" and individual circuits to other points on the course. These junctions are controlled by switches at places on the course and at the various exchanges, and are thrown off just before the races are due to start and back to normal immediately they are over. The other points on the course are made up by extensions on rural call office circuits or by running temporary rubber-covered wire thrown over trees and hedges. There is a 10-line switchboard fitted in the Control Tower with exchange lines and extensions to various parts of the Grandstand area. It will, therefore, be obvious to the reader that all these circuits are more or less of a temporary nature, and it is interesting to note that only two faults occurred during the week and these were caused by riders crashing into the telephone boxes on the mountain. This year, on account of communication being available with the mainland, seven direct exchange lines were provided from the Press stand for various Press agencies. The A.C.U. also provided four lines fitted in cabinets in the Press enclosure, to be used as call offices by those representatives of the Press not having their own lines.

Every paper of importance in the British Isles, and a large number on the Continent, were represented. It was for the first time in the history of the T.T. Races that London papers were reporting full details in their evening editions. In fact, the winners of the various races were known in Fleet Street and other news centres immediately they had crossed the line.

To give one some idea to what extent the Press used the telephone, on Friday, the day of the Senior Race, there were 154 calls booked to various parts of the British Isles and the Continent, 80 of which were "fixed time" calls. A rather interesting event occurred on Friday, just after the race. The weather had changed rather suddenly when a representative of the German Press, who had flown to the Island in his own monoplane, and was about to return, made enquiries as to whether he could obtain information regarding the weather conditions on the other side. It was suggested he should try the "Imperial Airways, Manchester

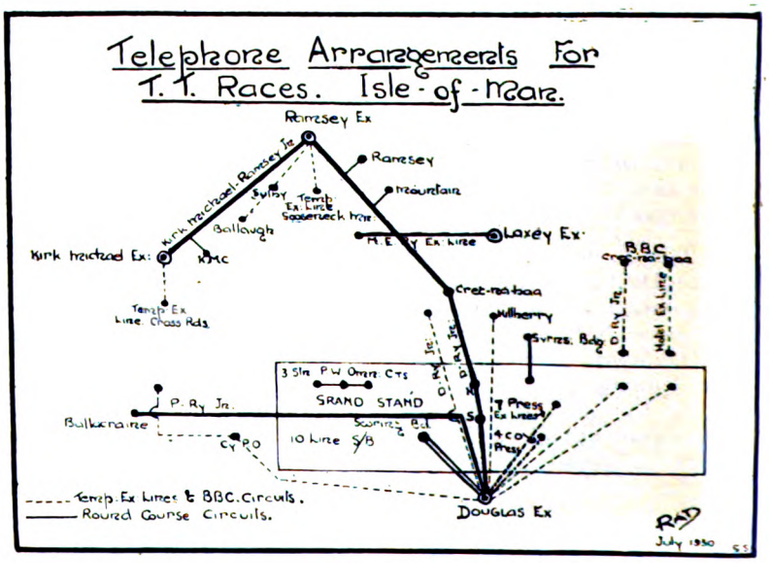

FIG. 3.

and Croydon." Calls were booked to these places and within 15 minutes he had all the information required. He was delighted with the prompt service he had received and the alacrity with which the Department's officers were able to help.

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The Press expressed their appreciation of the telephone arrangements and the manner in which their calls were handled. The following is an extract from one paper :—

> "The Engineers and Traffic Staffs of the Post Office Telephones had worked like galley slaves to give an efficient service. *They did*, and they are very proud of their 'Record.'"

"Yes, the Isle of Man's all right," a competitor in the greatest road race in the world was heard to remark. "It's a fine place," he went on, "but why on earth the Land of T.T. should have such a stupid and entirely inaccurate motto as *Quocunque jeceris stabit* I cannot understand. Just fancy—"Whichever way you throw it, it stands."* What a motto for a T.T. rider!"

It may be of interest to know that "The Manx Grand Prix" will be held on Sept. 9-11, 1930. These races are run over the T.T. course, and the same conditions apply.

TELEPHONE DEVELOPMENT OF BRITISH TOWNS AT THE BEGINNING OF 1930.

By W. H. GUNSTON.

At the beginning of this year there were 1,886,726 telephones in Great Britain and Northern Ireland, or 1 for every 24 inhabitants. Put in another way, there were 4.15 telephones per 100 inhabitants.

The subjoined list shows the development of all British cities and towns with not less than 20,000 inhabitants, at least 1,500 telephones, and not more than 26 inhabitants per telephone. As the ratio of telephones for the whole country, including the less developed rural districts, is 1 to 24 inhabitants, it would perhaps be expected that all the large centres of population would be above this average. This, however, is not the case: e.g., Newport, Coventry, Stockport, Newcastle-on-Tyne, Norwich, Southampton and other important places, all fall below the average development.

It should be borne in mind that the first half-dozen towns on the list, with their 700,000 telephones at a ratio of 1 to 11 or 12 inhabitants, account for considerably more than a third of all the telephones in Great Britain. It will be observed that they are actually twice as well developed as the country as a whole. In Germany, also, the largest cities are more than 100% better than the country as a whole, while in France we find Paris nearly four times as highly developed as the whole country, so that the phenomenon of the telephonically more advanced cities being the dominant factor in their country's development is not peculiar to Great Britain. In the United States, however, the disparity between the whole and its parts is not so great.

It will be seen from the following list that the residential country towns and health resorts are well to the fore. The high figures shown for some of the places with less than 50,000 inhabitants should be accepted with some reserve, in view of the fact that the population figures (the latest available) are drawn from the census of 1921 and there is no doubt that in towns of this class the population has increased very substantially since that date. Naturally an increase of 30% in the number of inhabitants in such places would materially affect the averages shown, while the inter-censal increase in the average town, which may be only 5 or 6%, would have no such marked effect on the telephonic ratios. It is nevertheless an undoubted fact that the telephone development of places like Guildford, Harrogate, Eastbourne, &c., not to mention Bournemouth, is very good. Twenty-five of the first 50 towns of the list are in the South, 2 in Wales, 5 in the Midlands, 6 in Scotland and 12 in the North of England.

It should be mentioned that in the area operated by the Corporation of Hull there are 16,235 telephones, or rather more than 21 inhabitants per telephone.

* This obviously refers to the three-legged emblem of the Island.—(ED., *T. & T.J.*).

TELEPHONE DEVELOPMENT OF TOWNS WITH NOT LESS THAN 20,000 INHABITANTS AND 1,500 TELEPHONES.

		Population.	Number of telephones. Dec. 31, 1929.	Inhabitants per telephone.
1.	LONDON Administrative County (*London Telephone Area, including the above and Croydon, Walthamstow, East and West Ham, Leyton, Willesden, Tottenham, &c.*	4,483,200 7,406,000	487,927 661,977	9.2 11.2)
2.	Guildford	24,987	2,564	9.7
3.	Harrogate	38,938	3,674	10.6
4.	Bexhill-on-Sea	20,363	1,713	11.9
5.	Eastbourne	62,030	5,137	12.1
6.	BOURNEMOUTH (including Poole and Christchurch)	142,422	11,672	12.2
7.	Southport	76,644	5,832	13.1
8.	Tunbridge Wells	35,568	2,716	13.1
9.	Worthing	35,224	2,657	13.3
10.	Torquay	39,432	2,861	13.7
11.	Chester	40,794	2,942	13.9
12.	St. Albans	25,588	1,800	14.2
13.	Woking	26,430	1,857	14.2
14.	BRIGHTON and Hove	188,946	12,671	14.9
15.	Watford	45,910	2,894	15.1
16.	Oxford (including Headington)	62,380	3,983	15.7
17.	EDINBURGH	420,281	26,670	15.7
18.	Cambridge	59,262	3,764	15.7
19.	Blackpool	114,681	7,225	16.0
20.	CARDIFF (including Penarth) ...	217,359	13,319	16.3
21.	Folkestone (including Hythe, Cheriton and Sandgate) ...	54,573	3,293	16.5
22.	Southend-on-Sea	106,021	5,984	17.6
23.	MANCHESTER (including Salford, Eccles and Stretford) ...	1,055,473	59,338	17.8
24.	Aldershot	28,756	1,611	17.8
25.	BRADFORD (including Shipley)	314,268	17,309	18.2
26.	Ayr	35,751	1,914	18.7
27.	Cheltenham	48,444	2,578	18.8
28.	Luton	57,077	3,040	18.8
29.	Bedford	40,247	2,134	18.9
30.	LEICESTER (including Wigston)	242,780	12,810	19.0
31.	Perth	33,208	1,737	19.1
32.	Warwick and Leamington ...	38,808	2,018	19.4
33.	Shrewsbury	31,030	1,588	19.5
34.	LIVERPOOL (including Birkenhead, Bootle and Wallasey)	1,115,939	55,173	20
35.	NOTTINGHAM (including Arnold and Carlton)	292,969	14,610	20
36.	Huddersfield	110,120	5,408	20.4
37.	GLASGOW (including Clydebank, Rutherglen and Renfrew) ...	1,119,489	54,293	20.6
38.	Maidstone	37,448	1,812	20.8
39.	Exeter	59,608	2,967	20.9
40.	Reading	92,274	4,292	21.5
41.	BIRMINGHAM (including Smethwick and W. Bromwich) ...	1,068.956	48,932	21.9
42.	BRISTOL (including Kingswood)	390,018	17,623	22.1
43.	Hastings	66,496	2,956	22.5
44.	Aberdeen	158,969	7,059	22.7
45.	LEEDS (including Morley) ...	482,255	20,701	23.3
46.	Preston	117,426	4,991	23.5
47.	Dundee	168,217	6,929	24
48.	Newport	92,369	3,712	24.5
49.	Coventry	128,205	5,155	24.9
50.	Doncaster	54,052	2,164	25
51.	Stockport	123,315	4,940	25.2
52.	NEWCASTLE-ON-TYNE (including Gateshead, Gosforth and Wallsend)	458,201	18,134	25.3
53.	Norwich	120,653	4,736	25.5
54.	Southampton	160,997	6,287	25.6

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The following is the development of the areas with upwards of 10,000 stations, expressed in terms of telephones per 100 of population :—

London (Administrative County)	10.9
London (Telephone Area)	8.9
Bournemouth	8.2
Brighton	6.7
Edinburgh	6.3
Cardiff	6.1
Manchester	5.6
Bradford	5.5
Leicester	5.2
Liverpool	5.0
Nottingham	5.0
Glasgow	4.9
Birmingham	4.5
Bristol	4.5
Leeds	4.3
Newcastle	3.9
Sheffield	3.5
Belfast	3.5

PROGRESS OF THE TELEPHONE SYSTEM.

THE total number of telephone stations working at May 31, 1930, was 1,901,905, representing an increase of 12,712 on the total at the end of the previous month.

The growth for the month is summarised below :—

	London.	*Provinces.*
Telephone Stations—		
Total at May 31	683,295	1,218,610
Net increase for month	4,553	8,159
Residence Rate Subscribers		
Total	169,371	263,953
Net increase	1,201	2,240
Call Office Stations (including Kiosks)—		
Total	6,147	25,729
Net increase	69	343
Kiosks—		
Total	1,828	6,603
Net increase	66	152
Rural Party Line Stations—		
Total	—	9.923
Net increase	—	—
Rural Railway Stations connected with Exchange System—		
Total	17	1,710
Net increase	—	39

The total number of inland trunk calls originated during the year ended Mar. 31, 1930, was 117,130,213, representing an increase of 7,575,766, or 6.9% over the total for the previous twelve months. Outgoing international calls for the year numbered 535,977, and incoming international calls 581,831, the increases over the corresponding totals for the year 1928/29 being 81,673 (18.0%) and 91,662 (18.7%) respectively.

Further progress was made during the month of June with the development of the local exchange system. New exchanges opened included the following :—

LONDON—Downland (Hooley), Shepherds Bush (automatic).

PROVINCES—Ardwick, Collyhurst, and Moss Side (Manchester) (automatic); Bressingham, Broadclyst, Bubwith, Callaby, Farnell, Gt. Bardfield, Gt. Wakering, Inchture, Lea, Lhanbryde, Lochranza, Lower Guiting, Milborne St. Andrews, Sacriston, Stickney, Walcott, Wendling, Yetminster, Mareham-le-Fen (rural automatic); Poole;

and among the more important exchanges extended were :—

LONDON—Wallington.

PROVINCES—Basingstoke, Canterbury, Didsbury, Farnham, Louth, Solihull, Warwick.

During the month the following additions to the main underground system were completed and brought into use :—

Bexhill—Hastings (section of Brighton—Hastings—Eastbourne cable),
Salisbury—Basingstoke,
Maidenhead—Reading,
Carluke—Lanark,
Windsor—Egham,

while 76 new overhead trunk circuits were completed, and 87 additional circuits were provided by means of spare wires in underground cables.

REVIEW.

"Autobiographical and Other Writings," by Alan A. Campbell Swinton. (Longmans, Green & Co. 181 pp. Price 10s. 6d net.)

It is sad to record that whilst this book was still in the hands of the printers the author, Mr. Alan Campbell Swinton, distinguished for his radiological and wireless researches, passed away. The book is divided into three main sections, "Biography," "Verses" and "Addresses." The first section provides, perhaps, the most entertaining reading, Mr. Campbell's account of his ancestry, his training, his professional work and the people he met being both lively and instructive. He traces his descent from the Swintons of that ilk, the earliest known owner of which was Liulf de Bamburgh and de Swinton, a vice-comes of the Northumbrians, who died about 1118 A.D. He touches on the deeds of his forbears in history, and has some interesting anecdotes concerning the distinguished visitors to his home during his youth. Indeed, the whole of the first part of the book is enlivened with good anecdotes. Amongst them is one of Sir Frederick Bramwell, who was knighted about the same time as he was elected F.R.S. A client who had employed him before, complained that Bramwell's bill was unduly heavy. Bramwell explained that F.R.S. meant "fees raised since," and pointed out that he has now to pay for "knight" work. Another is of Sir Wm. Crookes, the great chemist, who was also a believer in spiritualism. When knighted he adopted the motto "Ubi crux ibi lux," the "crux" being a pun on his name. Some dinner-table wit, however, altered the motto to "Ubi Crookes ibi spooks."

Always of a scientific bent of mind, Swinton was attracted very early towards photography. He has no fond recollections of Fettes College, where he was educated, but complains of the unceasing round of compulsory games and uninspiring Greek and Latin verses which left the boys destitute of all originality. Even a telephone which he contrived to construct in 1878 or 1879, after reading an account by an American Professor of Bell's invention, was ordered to be sent home, and his housemaster refused to permit the dispatch to him of a box of photographic apparatus, although his father had written signifying his approval. He had to get up two hours before school commenced to pursue his scientific studies before anyone else in the house was about.

After an apprenticeship to Sir Wm. Armstrong, Mr. Swinton set up for himself in London as electrical contractor in the early days of electric lighting. He was one of the first to experiment with X-rays and to use them for taking photographs. He was also one of the pioneers of television and wireless telegraphy, and at an early date had a wireless telephone at work between his office in Victoria Street and his house in Chester Square. We may remark, in passing, that Mr. Swinton, like many who have touched on the subject, has very vague ideas about the telephone in the "eighties." He believes there was only one telephone exchange for the whole of London. There must, in fact, have been at least 15 at the time of which he writes.

An interesting chapter is that on Mr. Swinton's recollections of notable scientific men whom he met. There are excellent portraits

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of Huxley, Poulsen, Pedersen, Duddell, Sir Oliver Lodge, Lord Amesbury, Sir J. J. Thomson, Lord Rayleigh, Sir Wm. Crookes, Prof. Silvanus Thompson and a host of others. He is careful to claim Graham Bell, the inventor of the telephone, as a fellow Scotsman. Sir Joseph Swan, he says, was before Edison in the invention of the carbon filament electric lamp, although he admits that they were neck-and-neck when it came to commercial lamps.

All the addresses included in this book are well worth reprinting, that on "Discovery and Invention" containing much food for thought. In it Mr. Swinton points out that many of those who made the greatest scientific discoveries were amateurs pure and simple. The writer of the present review recently saw the same theory developed more fully in a small German work entitled "Kultur-Curiosa," in which numerous instances were cited of inventions discovered by dilettanti and amateurs.

Mr. Swinton instances Dr. Gilbert, author of "De Magnete," who was physician to Queen Elizabeth, Herschell, an organist, Franklin, a printer, Joule, a brewer, Humphry Davy, a surgeon's assistant, Faraday, a bookbinder's apprentice, Morse, a sculptor and painter, Graham Bell, a teacher of the deaf and dumb, while Professor Hughes was not a professor of engineering or physics, but of music!

We have, perhaps, said enough to indicate that this readable book forms a most interesting record of a cultured and adventurous mind.

RETIREMENT OF MR. P. F. CURRALL, DISTRICT MANAGER, BIRMINGHAM.

A REPRESENTATIVE gathering of Accounts, Contract and Traffic Branches met in the District Manager's Office on June 26 to bid farewell to Mr. P. F. Currall the District Manager, who was retiring after some 44 years' service.

The Postmaster-Surveyor, Lt.-Col. Brain, presided, supported by the Assistant Postmaster and the chief officers.

Several Head Postmasters and the head officers of the Survey, Postal and Engineers Branches attended.

The Surveyor, in a happy speech, drew attention to the long and varied career of Mr. Currall as District Manager, and at the close presented to him gifts from the Staff of a Compactum wardrobe and a sheepskin hearthrug, together with a beautiful bouquet for Mrs. Currall, who was unfortunately unable to be present through ill-health.

Several officers from the District Manager's Staff, including ladies, voiced their appreciation of Mr. Currall's qualities as District Manager, and expressed the hope that his retirement would bring him a greater measure of health than he had hitherto enjoyed. On behalf of the Head Postmasters, Mr. Noble (Walsall) and the Head Office, Mr. Grindley (Survey Branch) made appreciative speeches.

Mr. Murray (Contract Manager) made humorous reference to Mr. Currall's remarkable feats on the Golf Green, but no reference to the 19th hole.

Mr. Currall, who spoke feelingly, thanked all for their tribute to his service and to himself, and in the course of his remarks he instanced the great growth telephonically (35,000 stations to 75,000) in the district during his period of eight and a half years as District Manager in Birmingham, and his deliberate opinion was that the Telephone Service rendered to the public in Birmingham compared favourably with any other district in the country.

THE TELEPHONIST AND THE PRESS.

PAPER READ BEFORE THE LONDON TELEPHONISTS' SOCIETY BY W. H. GUNSTON.

THE link between telephonists and the Press begins, so far as I can ascertain, in the year 1883. As most of you are aware, telephone operating was originally performed by boys, and it was not until 1889 that women telephonists became practically universal. Nevertheless, in the early eighties Mrs. Claxton, the wife of one of the chief officials of the National Telephone Company, studied operating and is said to have trained the first girl operator (a Miss Ling) at Liverpool. She then undertook the training of female operators in London, where they were apparently introduced about 1882, and by 1883 were fairly well established.

In 1883, therefore, we come upon references to telephone operators in the Press; and I am sure you will all be gratified to hear that one of the first newspaper paragraphs extant dealing with telephonists gives you a handsome certificate of respectability. The *Pall Mall Gazette* of Dec. 6, 1883, has the following description of an exchange:—

"The wires which represent the subscribers of the East Indian Avenue Exchange are guided down from the derrick above into neat mahogany cabinets or cases, in front of which the young ladies are seated. The alert dexterity with which, at the signal given by the fall of a small lid about the size of a teaspoon, the lady hitches on the applicant to the number with which he desires to talk is pleasant to watch. On the day of our visit there had been in this one office no less than 2,400 calls. Here, indeed, is an occupation to which no 'heavy father' could object; and the result is that a higher class of young woman can be obtained for the secluded career of a telephonist as compared with that which follows the more barmaid-like occupation of a telegraph clerk."

The writer's intention is good, even if his grammar is weak; but why a telegraph clerk's occupation is stigmatised as barmaid-like I have been unable to discover with any certainty. Possibly he meant that a girl clerk at a telegraph counter was exposed in the pursuance of her duties to coarse contacts with my own sex, and that the more convent-like seclusion of an exchange staffed entirely by women guaranteed that sheltered existence so prized by fathers—if not by their daughters—in the 80's of the last century.

Well, then, the Press, having discovered the telephonist in the middle eighties, contented itself with occasional references to her, references increasing in number as the service grew more widespread and of greater national importance, and indeed since the Great War becoming quite numerous.

The telephonist appeals to the Press under two main aspects:—

1. As a woman, a girl or member of the fair sex.
2. As a servant of a much-criticised public administration.

1. *As a Member of the Fair Sex.*—The Press, as you know, is a mighty organ, and when it plays for the benefit of over a million people it must devote more of its efforts to light music than to classical themes—jazz must predominate over symphonies and fugues, or what is rather vaguely known as "high-brow" music. In other words, with circulations of over a million, newspapers quickly realise that amongst their readers the wise are greatly outnumbered by the otherwise, and they cater for them accordingly. They realise also that the majority of people would rather be amused than instructed, and consequently they adorn their papers with frequent representations of the ornamental and lighter side of women's life. You all know that when the first sunny day of spring appears, perhaps when the first crocus lifts its yellow head, you are confronted with a picture of "Merry bathing girls at Margate." (I may remark in passing that bathing girls are always merry in the pressman's point of view.) You are equally familiar with merry girl haymakers, merry girl students, merry hospital nurses, merry millgirls and other groups whose pictures make a very proper appeal to the susceptible hearts of man. All these are, of course, in addition to the lady golfers, lady tennis stars and oarswomen who share with the male exponents of sport such a large proportion of the columns of your newspapers. The fact is that the journalist knows, of course, that the picture of a bathing beauty makes a greater appeal to the general public than one of a female senior wrangler or even a poetess, that questions of long or short skirts, cigarette smoking and cocktail drinking by women, and the like, are more amusing than serious discussion of woman's avocations, woman's economic position, woman's future, and so on, although these subjects do not go altogether uncared for. You see, therefore, that in the first place you are interesting to the Press purely as women. Therefore, when the journalist learns that there are, we will say, upwards of 13,000 telephone operators he says, Hallo! here are 13,000 potential romances, 13,000 potential bathing beauties, 13,000 potential flapper voters, 13,000 potential subjects for pithy paragraphs and picturesque illustrations; and he embraces you (metaphorically, of course) with open arms.

2. *As a Public Servant.*—Having touched briefly on the first aspect of the telephonist in relation to the Press, we will now consider how the Press reacts to her as a public servant. I might divide this section of my discourse into several sub-sections, as for instance:—

(*a*) The telephonist as an efficient and hard-working official, fulfilling exacting duties with tact, speed and dexterity. This is the common view of those who have taken the trouble to visit an exchange working at full pressure.

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(*b*) The telephonist as heroine, who rises to the occasion during bombardments, flood, fire and on similar occasions.

(*c*) The telephonist as disappearing "Hello girl," threatened with extinction by the "girl-less telephone." This is an inexhaustible theme and has aroused the tender solicitude of the journalist since the beginning of this century on almost every occasion when a new auto-exchange was opened.

(*d*) The telephone girl as the haughty and unbending minion of a stiff-necked government monopoly, who is not amenable to reasoning or reproof, much less eligible for such a drastic disciplinary measure as the "sack."

(*e*) The telephonist as dispenser of wrong numbers and engaged calls, who is "sorry you are tr-roubled." We are here getting back to the province of the humorist who is always with us in the daily press, whose efforts do not only fill up odd corners, but who now also spreads himself at large across the editorial pages.

I could go on developing these sub-sections to a tenthly and lastly in the manner of a sermon, but I think you will absolve me, before I have finished, of any intention to preach. I will therefore deal with these sections of my subject not one by one but in a general manner, and endeavour to show what has been the varying attitude of the Press to the telephonist during the past 30 years or so.

I may say at once that it has in the main been sympathetic, with a general tendency to take the important public service she renders more and more seriously. The patronising and bantering tone of some of the earlier references is well exemplified in a cutting from the *Star* newspaper of August, 1896, which I have come across. It seems that a Russian gentleman with the promising name of Apostoloff had invented an automatic system. An Apostoloff Syndicate appeared in London, and the name and idea at once appealed to the Press humorist.

The *Star* reporter must be likened to the man in Goldsmith's poem who came to scoff and remained to pray. He begins thus with a few well-chosen words of scorn :—

"The days of the telephone girl are said to be numbered, and one of the most maddening irritations of the modern business man to be on the eve of abolition. Her calm superiority, her leisurely indifference, her sublime stupidity, her absolute reliance on the fact that you can't get at her and mustn't swear at her, will not much longer protect that still small scornful voice. For a benefactor of his species has invented an automatic telephone, which is to enable subscribers to communicate directly with one another without the intervention of 'human aid'—by which flattering term the inventors designate the telephone girl. A *Star* man who has inspected the machine at the offices of the Apostoloff Syndicate in the City reports it perfection itself."

I will spare you the description which follows of the disc you have to revolve and the bells you have to ring; I will merely remark that, unfortunately, nothing more seems to have been heard of this perfect system in England.

The article concludes :—

"Under the present system a 'telephone young lady' is employed for every 50 subscribers. And there are over 30 exchanges in London alone. An exchange with 3,000 subscribers, such as that at Lime Street, in the City, has therefore 60 telephone young ladies. And if one telephone young lady can drive the average man into a frenzy, what cannot 60 drive him to? It is their own fault that mankind prays for their suppression.

"These were the *Star* man's views till he looked further into the matter. He called at the offices of the National Telephone Company to inquire if the Apostoloff system would be adopted.

"The secretary admitted he had heard of it, which, as monopolies go, was making a big concession, but referred the inquisitor to the general manager. The general manager's representative agreed that the general manager had inquired into the new system, and made a report upon it to the directors, but as to the nature of the report or the practicability of the invention he could say nothing. But when the *Star* man was courteously conducted over one of the exchanges, and saw the sweet girl operators with their muzzles on, his heart went out to the telephone young lady. 'Are not these neat suburban girls of more account than machines?' he asked himself, 'and is it to be wondered at that sitting here all day, with the apparatus strapped upon their devoted heads, to be nagged at by fifty thousand impersonal cads and curmudgeons, they learn the feminine trick of "answering back"?' He would have liked to get their views of the Apostoloff machine, but you musn't talk to the girl at the telephone."

You will see that the reporter, with his "sweet girl operators" and "neat suburban girls" means to be kind. He was not using the word "suburban" in the patronising sense in which it is sometimes employed nowadays; I think he meant to imply that the exchanges were not staffed with wild bachelor girls from Soho or Pimlico, but only with young ladies from the best residential suburbs. This is one of the first references to the abolition of the telephone girl I have come across. After that date various automatic exchanges were successfully opened in different parts of the world, and as I have already mentioned, on every occasion, as soon as the fact was thoroughly grasped by the journalist, one saw the headlines: "The Doom of the Hello Girl," "Hello Girl must go," "A Girl-less Telephone," or something similar. This cry seemed, in my recollection, to reach its crescendo in 1909, in the middle of which year an American consular report discovered that a flourishing automatic exchange was at work in Hildesheim, in Germany. As a matter of fact, not only had this exchange been then working for some time, but there were other and larger machine-switched exchanges in operation elsewhere. But the news became broadcasted by the Press bureaus and there was a perfect outbreak of both commiseration and rejoicing with regard to the doomed telephone girl. The following lines appeared in the *National Telephone Journal* on the subject :—

The automatic evergreen appears
And fills our buoyant Press with hopes and fears.
"A Girl-less Telephone" their headlines show,
"Doomed operators," "Hello Girls must go."
Whether the fear was greater or the hope,
We do not know, but (parodying Pope)
Of operators it may be assumed
They never *are* but always *to be* doomed.

Paradoxical as it may seem, the more the telephone girl is "abolished" the more she increases in numbers. The more "girl-less" telephone exchanges there are in the world the more "girl-ful" (if I may be allowed the expression) become the other large and ever-growing exchanges. You may be surprised to hear that there are employed in this country in 1929 as nearly as possible treble the number of operators that were employed in 1909, despite the rapid spread of the machine switching principle in all directions during those 20 years.

The way of the prophet is not always easy: but perhaps I may be permitted to quote a modest and successful effort which I made in this direction in the *National Telephone Journal* of October, 1909, when I said: "The operator will go on being doomed periodically until she has left the service, married and possibly brought up daughters who, if they become telephonists, will no doubt be doomed in their turn when some newspaper discovers that there is an automatic system in full swing at Timbuctoo or Tehuantepec."

I may add that I know of at least one operator who was in the London Telephone Service in 1909, whose daughter is now in the same service. This young lady, if she reads the papers, will have learned on several occasions that she is doomed. I have no doubt that many other cases could be found, if the subject were worth closer enquiry.

If I may turn aside for a moment from the main current of my theme, I should like to warn you, ladies, against taking seriously the views you find aired in the correspondence columns of your newspapers. Of course, newspapers take no responsibility for the vagaries of their correspondents, but still they do allot valuable space to the ill-informed and the unbalanced. There was a time, perhaps, when the people who wrote letters to the editors of journals were those who had something to say, some special knowledge to impart, some intelligent criticisms to offer on the subjects they discussed—their letters, though not the work of expert journalists or literary men, did give useful expression to the common-sense opinions of the average intelligent citizen. But the popular daily newspapers nowadays cast their nets far wider, and no subject is too trivial, no opinions are too shallow or ill-considered, to find acceptance in the Correspondence column. As an example, there was a letter not long since in the *Daily Express* from an engaging person who suggested the entire abolition of women telephonists and their replacement by ex-service men, who she (or he) was sure would be both more expert and more obliging than the present staff. You will be interested to learn that in this dispassionate observer's opinion, operators were a snobbish class (and she claimed to have worked with them) and in the majority of cases—mark, the majority of cases—they worked only in order to obtain extra money to spend on Continental holidays. One may hope that this acute and discriminating observer is now adorning some other sphere, where her singular talents have freer and fuller play.

Having jumped ahead in our historical researches from 1896 to 1909 and 1929, we will now go back to 1903, where we still find the Press divided in its mind about the character of the telephonist. A paragraph was then going the rounds to the effect that the German Administration had warned operators "that in all intercourse with the public through the telephone they are to be careful to be polite, and if subscribers become impatient or excited, the officials are never to give a hasty or impolite reply under any circumstances whatever." The weekly journal *Truth* comments on this: "The National Telephone Company and its staff might take a hint from Berlin with advantage." (Of course, the Company's orders had always laid down that under any provocation whatsoever politeness to subscribers must always be maintained, and it is difficult to conceive how any exchange could be worked by a staff which was permitted to "answer subscribers back.") Nevertheless, according to *Truth*, "the mildest remonstrance addressed to the young lady at the exchange generally produces a 'cheeky' reply and what would happen to an English subscriber who allowed himself to become 'impatient' or 'excited' I tremble to think of. Probably the wires would not hold the young lady's language."

I think my hearers, with their knowledge of a long tradition of standard expressions and unvarying politeness to subscribers, will best appreciate from which end of the lines the strongest language originates. This reminds me of a short, and, I could wish, true story. A subscriber fiercely bellowed :—

"Is there a blithering idiot on the line?"

and there came the soft reply, of the kind that turneth away wrath :—

"Not this end, Sir."

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In the same year, however, 1903, I find a very appreciative article on the Telephone Girl in the *Daily Telegraph*. He is describing the then new Post Office exchange in Queen Victoria Street :—

" Entering this sanctum, the impression is not easy to dismiss that one has strayed into a classroom, in which the girls, occupying high stools, sit facing calculating blackboards, and that they are having a chattering time of it, regardless of the monitors at their desks in the centre of the hall. The majority of the girls come from the middle class and are trained in a telephone school. Fancy may picture pleasingly the telephone girl as neat and comely, dark or fair, with a pride in her coiffure, and a taste for dainty blouses, and fancy would not be far wrong. Attention is at once drawn to the bright band which makes a not unattractive headdress encircling the hair. It purpose is simply to support conveniently the earpiece of the telephone, the mouthpiece being also ingeniously kept at constant range, or fixed focus, so to speak. The buzz of conversation is not between the girls themselves, but between them and the distant subscriber, and, playing the part of eavesdropper, one perceives that the interchange of ideas is strictly limited, not to say monotonous. Every user of a Post Office telephone knows that when he takes it off the rest a gentle voice will be heard inquiring, without a shadow of personal interest : ' What is your number, please ? ' You tell the owner of the voice your requirements, and you are ' put through.' "

The article on the whole is quite a serious and sympathetic description of exchange working. It is comforting to find that the breastplate transmitter is no longer referred to as a muzzle, but you will probably be amused to hear how the vexed subscriber " may be switched on to one of the monitors, who are ladies of mature years, not possibly more accustomed to masculine language, but possessed of authority to soothe a ruffled temper by tact and discretion." I do not know what the writer's idea of mature years may have been ; one can only say that it is not an expression which would be applied nowadays to people of the average age of the monitor.

The next item I come across in the old press cutting books which have furnished me with much of the matter for my paper to-night is an important one. It is the telephonists' strike of June, 1904. You can imagine how the *Daily Mail*, the *Daily Mirror* and the *Daily Express* rejoiced in such headings as " Hello Girls on Strike," " Telephone Girls Revolt," " Hard Chairs, Long Hours and Heavy Instruments," " Slaves of the Ring," " Fair Telephone Operators threaten to go on Strike," and so forth. It is only fair to say that they were thoroughly sympathetic to the girls' grievances, and by putting their case before the public at large it is quite possible they helped them materially in getting their way with the Company, who eventually yielded to their demands and reinstated all the telephonists who were under notice of dismissal for standing out. The grievance was that they were asked to work longer hours without additional pay ; but here we are in danger of getting one of those " Headaches for Historians " of which *Punch* is so fond of giving amusing specimens. Some accounts say that the operators were to be required to work an extra half-hour a day, some one hour, and some two hours. The facts seem to be that the staff had signed on for 45 hours a week, but had not hitherto been required to work that time. They were now asked to work the full time and more—as to the amount of which accounts vary—as I have said.

Six months later another strike, though on a smaller scale, was threatened, which was promptly averted by the good sense of the Company's General Manager, Mr. Gaine, or by the persuasive powers of ladies who waited upon him to discuss the question. The authorities had rashly presumed to dictate what the telephonists were to wear whilst on duty. It was to be limited to black and white, the official explanation being that the object was to prevent the girls dressing beyond their means. Mr. Gaine wisely gave way and colours won the day. The only report I have before me is a humorous account from the *Referee*, probably written by the late G. R. Sims. He says, perhaps ironically, the company's idea was magnificent and its principle a perfectly sound one. If it could be generally applied it would have far-reaching consequences. It would completely ruin the drapery trade, bring about the untimely death of hundreds of publications which live upon female vanity and cause the streets of the capital to look like a Dutch town on Sunday. But it would be the first great step towards the simple life for which the earnest students of the times are craving. He concludes : " If ever selfish man attempts to introduce a law to interfere with the gay feathers of the fair I shall be found on the side of the Angels ! "

From 1905 to the period of the Great War I do not find anything of particular note in the reactions of the Press to telephonists. We find on the one hand straightforward accounts of an exchange at work, when the efficiency and dexterity of the operators are usually remarked on, and on the other hand the usual grumbles at alleged inattention, wrong numbers, &c., with an occasional rejoinder defending the telephonists.

The Great War and its concomitant deeds of heroism and devotion to duty on the part of operators I shall only touch on briefly. It is sufficient to say that when they came to the notice of the Press they were generously appreciated at their full value. As Mr. Mantle said, however, in his presidential address to this Society, " the full story of the work of the telephone staffs during the Great War remains to be told and is but little appreciated by the outside world. When it is told it will be an inspiration to all who follow in their footsteps to be ready for and equal to any emergency." As a brief instance I quote from our own *Journal* of October, 1915 :—

" In the recent Zeppelin raid on the London district, no less than 436 telephonists reported for duty at their own or the nearest exchange and 120 volunteered their services, but were not needed—a total of 556 in all. These figures are so eloquent that they need no comment." Similarly, any incidents of devotion to duty during floods, fire and other catastrophes have received their full meed of appreciation from the Press.

I think, as I have already indicated, that one of the main features of the attitude of the Press to the telephonist during recent years has been a desire for fair play. Intemperate criticisms of the staff of an exchange at any given place are usually followed by the publication next day, or soon after, of letters championing the operator. Sweeping attacks on the service are often accompanied by reports of interviews with the exchange staff and by any attempt to learn the telephonists' point of view—often with the happy result of eliciting the fact that, after all, there is little to complain of. The vast majority of telephone users have only the vaguest ideas about the inside of an exchange or of the methods of working it. The Press, always in search of good copy, has on the whole a much better understanding, the result of beneficial visits to these great nerve centres of the country's economic life. It could, I think, be demonstrated that the old jokes about novel-reading and knitting at the switchboard are disappearing (the wrong number joke having become the great sheet anchor of the Press humorist), whilst appreciative and intelligent accounts of the telephonists' calling are nowadays by no means an uncommon theme for the journalist's serious efforts.

Sometimes one can suffer from one's friends. For instance, I might name the exuberant paragraphist who wrote a few years ago in one of the great dailies as follows :—

" More than a thousand of London's prettiest women work every day in the large telephone building near St. Pauls. Hundreds of women of 5 ft. in height, with good teeth, acute hearing, perfect eyesight, perfect respiratory systems and normal digestive powers were seen in the telephone exchange by a woman representative yesterday. . . . There were rows of large angelic grey eyes, sparkling brown ones, unsuspicious blue and fascinating green eyes. Most of the girls had bobbed hair, but beneath the switchboard lights it gleamed honey, russet and raven."

A little of this was too much for *Punch*, as no doubt it is for you. Reminded of Beauty and the Beast, *Punch* said :—

" I have always considered it one of the gravest defects of the telephone system in this country that the subscriber cannot see the operator. If this reform cannot be arranged meantime, the next best thing is to have something like the foregoing details on which the imagination can work.

" In the absence of such information a worried subscriber is apt to lose his head and behave abominably. I myself have overheard a man in the City flatly tell her that he didn't believe her when she said a number was engaged. Now, if he had known the young woman to whom he was talking had a perfect respiratory system (enabling her to say ' Newington, ninety-nine " without the suspicion of a wheeze), angelic grey eyes and bobbed hair which gleamed honey, he would never have lost control of himself like that. Instead, he would probably have said politely, ' Really ? Then I'm so sorry to have troubled you. Good morning.' "

The coming of machine switching, slow but sure, is inevitable, but changes seldom take place without laments for the old order which is passing away. There is no doubt that however much subscribers may appreciate the automatic, they part with regret from the skilled and sympathetic co-operation of the operator in their telephonic hour of need. This was very nicely put in a Leeds paper, a city which, as perhaps you know, has been working on the automatic system for some years. The writer pays the telephonists the following tribute :—

" Alas, I can offer them only my thanks and a friendly farewell.

" The line might buzz and howl like the atmospherics of transatlantic wireless, but the Leeds telephone girl's voice would come through with helpful precision and briskness.

" One imagined her sitting throned in state, lifted above our petty turmoils, directing the leashed forces of electricity with queenly grace and composure. Her soothing words calmed the stormy breast with Olympian dignity. We saw her not. She was a goddess in the cloud, a voice behind the veil.

" No more shall we be able, when Fate is perverse, to liberate our emotions by saying, as we sometimes most unjustly did : ' Miss, you've given me the wrong number. What are you doing ? ' The dial will stare at our confusion with no more human qualities than a brassie damned for slicing a ball, and we shall know that we have only ourselves to blame—always a hard lesson for humanity.

" Smoother of many a rough moment, helper in many worrying plights, enviable speaker of the clear word, accept a telephone user's sincere thanks."

Here, then, perhaps we may all part for the present on good terms—the telephonist with the pressman who has learned to value her efforts to provide him as efficiently as possible with the most rapid means of intercommunication known in an imperfect world ; the pressman with the telephonist who by now appreciates his sympathy with her troubles and his growing readiness to give her fair play ; and lastly the lecturer with his indulgent audience, not without a prayer that he may be exonerated from a charge of flippancy in his desire to be entertaining or of boring them with too many quotations from old files of newspapers and yellow-edged press-cuttings.

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PEREGRINATIONS THROUGH THE BROADCASTING WORLD.

By J. J. T.

(*Continued from page* 195.)

THE criminal mind has quite naturally availed itself of the broadcasting potentialities of the transmission of information without the use of wires. Not long since a gang of swindlers in Germany made scoops to the tune of thousands of pounds before they were traced. A portable set afforded excellent facilities for picking up racing information at the most convenient point, their confederates specialising in this instance on French racing results. Whether from French territory or not was not disclosed. It is sufficient to state that the procedure was simplicity itself. When the results were received, a messenger would saunter past the door of the victim bookmaker with the results conspicuously displayed on an ordinary newspaper, in code. At or near this point another confederate would be handy ready to make the bet of a "dead cert"!

It was some time before the fraud was detected, and then only when members of the gang began to swindle one another and a disgruntled partner disclosed the scheme to the police.

M. Chiappe, Prefect of the Police in Paris, did not decide to institute his "Air Police Service" until it was discovered that unscrupulous financiers were secretly broadcasting abroad their orders for "the purchase or sale of francs from secret wireless stations." The "Air Police"—a somewhat misleading title, by the way, and rather associating this new force with aeronautics than radio communication—is recruited from Army telegraphists under the charge of M. Lahure, a specialist in broadcasting, particularly short-wave transmission. By means of the Belin system it is hoped, even if it is not yet actually in use, eventually to broadcast photographs and finger-prints of wanted criminals.

A fairly recent conference of county chief constables at our own Home Office, according to *The Electrical Review*, has made similar proposals for the rapid dissemination of information regarding crimes and the movements of criminals.

Broadcasting and Trawlers.—The obvious use of wireless broadcasting in connexion with fishing vessels springs to the mind at once as being "safety at sea," "information regarding the location of fish shoals," and also the "state of the fishing markets, at their respective home ports." Few of us, who probably look upon ourselves as mere land-lubbers, would associate the general adoption of wireless apparatus by trawlers with the fact that the Iceland Minister of Justice has recently been much perturbed because no foreign trawler has for some time been arrested for fishing in forbidden areas round Iceland. He did not ascribe this phenomena to the smartness of the Icelandic coastal vigilance, nor has he claimed a pair of white gloves as a tribute to the improved ethics of foreign fishermen. Not at all, and he was right. It has recently been discovered that these wicked fishermen have utilised the latest modern invention as a means of mutually broadcasting, by means of codes, the proximity of the sea police that patrol the coast of Iceland! Steps are, therefore, to be taken to bring a Bill before the Althing to compel all Icelandic trawlers to carry wireless apparatus. These sets will be under Government control and every message heard is to be recorded. Icelandic trawlers will not be allowed to use codes other than those duly authorised. By this means it is hoped that any illicit co-operation between Icelandic and foreign boats will be prevented. Reuter's Copenhagen Agency states that the maximum fine is to be fixed as high as 30,000 Kr. The Bill has not yet become law, it is understood. Meanwhile, no foreign trawlers are yet being shamefacedly towed into Reijkavijk! Mr. F. Kellaway, Chairman of the Marconi Company, speaking at the annual banquet of the Radio Manufacturers' Association at the Savoy Hotel, in December, most certainly did refer to wireless as the "happy hunting ground of the charlatan and sharepusher," but it has been left to the simple-minded seafaring man's imagination to introduce another use——or is it abuse?—for radio communication!

Legal Problems.—There are indeed quite sufficient legal points at issue in connexion with the art and science of broadcasting, apart from items already mentioned. Thus, the Lindsey licensing authority has recently had under discussion the question of certain innkeepers of Gainsborough, Lincolnshire, who, upon learning that they are breaking the law by providing wireless entertainment for their customers without first paying for an entertainment licence, each tendered the cost of such licence —5*s.*—to the local magistrates. The latter, however, referred the matter to the higher authority, while the seven applicants have been given sanction for the wireless entertainment to be continued, retaining their fees until further notice.

Electrical Interference.—Special regulations and laws have by this time been laid down by local and other competent authorities in many of the large countries regarding "interference" with wireless transmission. In Great Britain special observations have been made and an actual assessment of the various kinds of electrical interference noticed as indicated by the number of letters of complaint received by the B.B.C., for example. The latest, that for the 12 months ended December, 1929, has recently been published by *World Radio*, and are hereunder given. The return does not include difficulties due to tramway and trolley-bus systems.

Origin of Interference.	*Percentage.*
Motors driving machine tools, &c.	23.09
Small accumulator-charging plant	14.12
Refrigerating plant	10.01
Generating plant and underground or domestic power mains	9.50
Overhead telephone, signalling and power lines	6.29
Kinemas	6.10
Flashing signs	4.96
High-frequency medical apparatus	1.71
Electric lifts	1.24
Large ventilating fans	0.66
Electric railways with overhead power lines	0.58
High-frequency furnace	0.09
Unidentified	21.65
	100.00

Similar steps have been taken by the German authorities, who have found that high-frequency medical apparatus is the most serious source of disturbance. *The Electrical Review*, remarking on this latter feature, suggests that the evidence of so large an amount of interference attributable from this one particular branch of electricity is due to the fact that such apparatus is more generally used in Germany than in Great Britain.

While mentioning Germany in this relationship, it appears that the municipality of Bockenem (Hanover) has introduced special measures to prevent electrical interference with wireless reception. A recent decree prohibits the use of all high-voltage apparatus unless it bears the Government stamp signifying that no undesirable radiations are produced by its operation.

It is unfortunate that there are no published figures regarding the proportion of interference due to tram and trolley-bus systems, as it is well known that no small amount of inconvenience is caused by overhead power traction. As these lines are penned a paragraph regarding complaints received by the Corporation Tramways Committee of Oldham is before me. The matter was dealt with

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by the general manager, who reported to the Committee that he had "carefully considered representations which had been made with reference to interference with broadcasting reception alleged to be due to the running of the Corporation's tramcars and submitted his observations thereon." Upon this report the Committee, after discussing the matter, "was unable to see its way to take any action at present." Not an altogether satisfactory position, if one may be permitted to make a simple comment. So much for a tramway service and its interference with broadcasting! The next instance, taken at random, is that of a public wash-house, driven by electric power at Levenshulme, and alleged to be causing interference with reception in the neighbourhood. Here the Postmaster-General communicated with the Municipal Corporations Baths Committee of Manchester on the subject, and as a result "experiments have been carried out with the co-operation of the chief electrical engineer of the Corporation with a view to the elimination of such interference."

To the lay mind these two cases give the impression of obscurity as regards the legal position of broadcasting and outside interference in this country.

Judging from two legal decisions delivered in a French court within the last few months, it would appear that "parasitic interference" in certain cases can be dealt with under the French Civil Code, where Art. 1382 provides for "reparation for prejudice caused by other persons." Case No. 1.—An action for interfering with his reception of broadcast programmes was brought by a private resident against his neighbour, the proprietor of a café who utilised a gramophone, driven by a faulty electric motor, for the purpose of reproducing dance music. The court judged that the case against the defendant had been proved and ordered the latter to replace the defective motor with an efficient one, to pay the plaintiff 50 francs per day in the interval and also 500 francs as damages, plus the cost of the action. Case No. 2.—This action was also brought by a private individual who pleaded that he was unable to enjoy the broadcast advantages of his wireless set owing to the interference from the working of a large electric sign. The court's judgment in this instance was again in favour of the plaintiff, the defendant being ordered to remove the electric sign entirely, which, it is stated, cost several hundred thousand francs to erect, and also awarded the plaintiff 10,000 francs as damages! "What," asks a contemporary and technical journal, "would have been the nature of the judgments had the source of the trouble been an electric tramway service or a generating station"?

Radio Exchanges.—Centres from which wireless programmes may be redistributed by private persons are gradually increasing. It appears to be within the power of the local council or corporation to give the necessary permission, as, for instance, the Blackburn Council, the Rawtenstall Corporation, St. Anne's-on-Sea, &c., &c.

Battery Eliminators.—The steady increase in the use of all-electric receivers has raised one or two legal points in connexion with broadcasting. On the wisdom of not bringing "eliminators" into use until the local current supply authority has been advised in writing and the communication duly acknowledged, there is no doubt. The Swansea Borough Electrical Engineer has reported to his Corporation Committee certain risks involved in the unauthorised connexion of wireless set battery eliminators to the domestic mains. The regulations in the borough of Swansea, as in many other centres of electrical distribution, are very clear on this point.

There is, however, still some hesitation on the part of certain authorities as to what is to be done in those cases where eliminators have been duly authorised and in use for some not inconsiderable period, when the change-over from d.c. to a.c. takes place. Is the vendor or the user of the current to pay for the necessary alteration to radio apparatus? A conference of representative engineers of the South-East Lancashire electricity undertakings which still supply direct current was recently held in order to arrange a common policy, but no decision so far has been declared. Some of the authorities interested are inclined to maintain that eliminators were fixed at the risk of the user and therefore the user should bear the expense of the necessary change. They urge that while the cost of the change to the individual would be comparatively small, the total expense to electrical distributors of the total of these pieces would materially and detrimentally affect finance. The Chester Corporation Electricity Committee has deferred any consideration of the matter, either by the S.E. Lancashire Conference or locally, until the Electricity Commissioners state "the terms upon which they will be prepared to give their sanction for the change-over of the local electricity distribution system." The Urban District Council Electricity Committee has taken a tentative step by requesting its chairman and engineer to investigate and recommend the best means of meeting claims in respect of wireless and other apparatus arising from the change-over from d.c. to a.c.

Who would have thought a few years ago that one's wireless receiver would be likely to prove so troublesome a little thing to corporations and companies engaged in the heavy current line?

(To be continued.)

"CALIPHONY."

BY W. T. L. (*C.T.O.*).

IT cannot be denied that a caligraphic or typewritten record of a telephonic conversation would be a valuable asset to practically every subscriber and service that uses the system even in the slightest degree.

Although such an invention has often been the subject of conjecture, perhaps even at the moment of writing an inventor may be cudgelling his brains and experimenting with apparatus in an attempt to produce the necessary attachment.

There are, of course, difficulties to be overcome, but to the writer the most prominent is the question of phonetics. For instance, the word "sceptre" would appear as "septer" and "physics" as "fizics," should it ever be possible to make a visible record of one's voice; which is a very different proposition to recording a voice. We already have that in the dictaphone, &c.

For months past the writer has racked his brain and has concluded that materialisation of the idea is quite feasible. The difficulty of phonetic inscription may be overcome by spelling the words letter for letter. In these days of photo-electric cells, selenium, and the thermionic valve, this should not present many difficulties to those who have the necessary apparatus at their disposal.

Phonovision provides the nearest approach as yet demonstrated to producing an audible record of distinction between things which, to us as human beings, are apparently similar. I say audible, because it has been found that when an image of a subject is received on a televisor, sounds which can be recorded and identified with that subject are produced. If a picture of the human face appears in the receiver, the relative sound can be recorded and reproduced at will as the original picture.

It would appear that every subject possesses a noise of its own; for when the image of various faces or objects are so recorded and reproduced, the distinction is made very apparent by a replica of each face or item appearing in the screen.

Here, then, appears to be a basis upon which to discover ways and means of introducing the "caliphone."

When one speaks into a microphone we know that at the distant station the diaphragm in the receiver vibrates, and that

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our voice is primarily responsible. If, however, a thermionic valve is introduced, that vibration will be increased to a much greater frequency. Suppose it were possible to actuate a relay by the same method; and to that relay a series of small electro-magnets were attached. Within the "fields," light metal bars with type-heads might be so placed as to be attracted when the current passes through the coils. As the type struck the revolving ribbon, which has been set in motion by the bell, or connexion, it would leave an impression on the paper beneath.

It may be suggested that when speech was being transmitted the frequency would be uniform, and therefore operate all the magnets simultaneously. But—and this is where the reference to phonovision *almost* justifies its existence—articulation provides for distinct pronunciation between each letter of the alphabet, and also of figures up to ten. What if a circuit could be so arranged as to utilise this distinction for the purpose of varying the frequency, which, passing through the relay, would bring the corresponding magnet into play!

"F" stands for "Father," and "S" for "Sugar," when transmitting over the telephone at present, and we must remember that in caliphony our voice would form the control of an electrical appliance, and that "F," in this respect, would have a different effect to that of "S."

The writer has coined the word *caliphony* for want of a better. Perhaps by the time this utility makes its bow, the authorities will have found a more attractive name.

LEEDS DISTRICT NOTES.

WE are an undemonstrative race and Civil Servants are by training and tradition possibly the least demonstrative of the body politic. It was, therefore, an eloquent tribute to the esteem and affection in which Mr. E. S. Francis (Sectional Engineer) is held that so many members of all grades

MR. E. S. FRANCIS.

of the staff, from Lt.-Col. Jayne, D.S.O., O.B.E., M.C. (Postmaster-Surveyor) and Mr. J. W. Atkinson (Superintending Engineer) downwards, felt moved to give verbal expression to their appreciation of him as a Sectional Engineer and their regard for him as a man. The occasion was a large and representative assembly of the staff on July 17 in the dining room, Basinghall Street, under the chairmanship of Mr. S. F. Whetton (Asst. Engineer) to present Mr. Francis with a cheque (for the purchase of a bureau) on his departure to take up his new appointment at Reading as Asst. Superintending Engineer of the South Midland District.

Mr. Atkinson, who made the presentation on behalf of the staff, paid a personal tribute to the efficient and willing help he had received at all times from Mr. Francis. Mr. T. A. Bates (District Manager) and other officers on his staff, referred with appreciation to the part played by Mr. Francis in building up the close co-operation which existed between the Engineering and Commercial Branches. Among the many other speeches made, probably none gave greater pleasure to Mr. Francis than that made by Mr. Newby (S.W. 1) on behalf of the rank and file. Mr. Francis, in a whimsical speech, which included some reminiscences of his 16 years' service at Leeds, expressed his thanks for the good wishes and the gift which accompanied them. He said he felt sure that the reputation for sound engineering work which the West Yorkshire District possessed, and which was the result of the splendid "team spirit" amongst the staff, would continue to be maintained. He treasured, he said, the goodwill of the staff, and the friendships he had made at Leeds, as very precious memories, and concluded with a quotation of J. M. Barrie's that "Memories were given to us that we might have roses in December."

The retirement of Mr. T. W. Cartlidge, Superintendent, Leeds, H.P.O., on reaching the official span of life, was marked by a dinner and concert held in his honour at the Guildford Hotel, Leeds, on May 31. Mr. W. H. Ayrton (Chief Supt.), who was in the chair, paid a warm tribute to Mr. Cartlidge's efficiency and loyal service during very difficult times. After some of the other speakers had regaled the company with amusing anecdotes of the early career of the guest of the evening, Mr. G. E. Graham, in a happily phrased speech, presented to Mr. Cartlidge a handsome oak grandmother clock, fish servers, and a painting, as lasting tokens from the staff of their high regard and good wishes for his future well being.

Mr. Cartlidge, in responding, was humorous and reminiscent, and in concluding said he had come to the opinion that if a supervising officer did his duty conscientiously, without fear or favour, he would win the respect and maybe the affection of the staff.

During the course of the evening an excellent musical programme was contributed by various members of the staff.

We have all seen notices flashed on the screen at the local movies asking "Will Mrs. Smith go home at once," or "Will Dr. Jones call at the Box Office as he is wanted immediately."

One has often wondered, however, what means would be adopted to get in touch with a person who was one of a widely dispersed crowd of thousands of people. Obviously the call boy system of the hotel lounge would not be a practical method to apply to a huge crowd. On the afternoon of the fourth day of the Test Match at Leeds, the query was answered. There was a slight stir in the crowd and everyone turned to look at a groundsman who was walking around carrying a banner (or, to be strictly accurate, a noticeboard on a pole) bearing a strange device "Will Mr. Archibald 'Blank' telephone London Mayfair—immediately."

Now as everyone knows, the afternoon of the fourth day of the Test Match was curiously devoid of thrills, and many people were getting bored. Mr. "Blank" was located in a very short time and went to telephone to the party anxious to get in touch with him. This was not by any means the only result of the notice. The word "telephone" had been suggested to the crowd. Behind us we heard a man say "Well, this is a wash-out, I am going to telephone to Jim to fix up a round of golf." Evidently similar thoughts had germinated in the minds of several spectators because there occurred a small but well defined movement in the direction of the telephone kiosks, and presently there was a queue of four or five people outside each kiosk.

This incident suggests possibilities in the direction of imbuing the telephone habit into the daily life of the man-in-the-street, a habit which, once formed, would be of the snowball variety and bring grist to the Departmental mill.

Bradford Notes.—Our regular Bradford correspondent has communicated some disjointed notes containing the words "favourite resort"—"brief respite from multi coin boxes and calling signals"—and "Morecambe," from which we conclude that she has either departed on leave or has just returned to the daily round after a brief spell at the seaside. She does, however, remind us that our congratulations are due to Miss C. Steel on her success in the Clerical examination, though her success may soon mean Bradford's loss.

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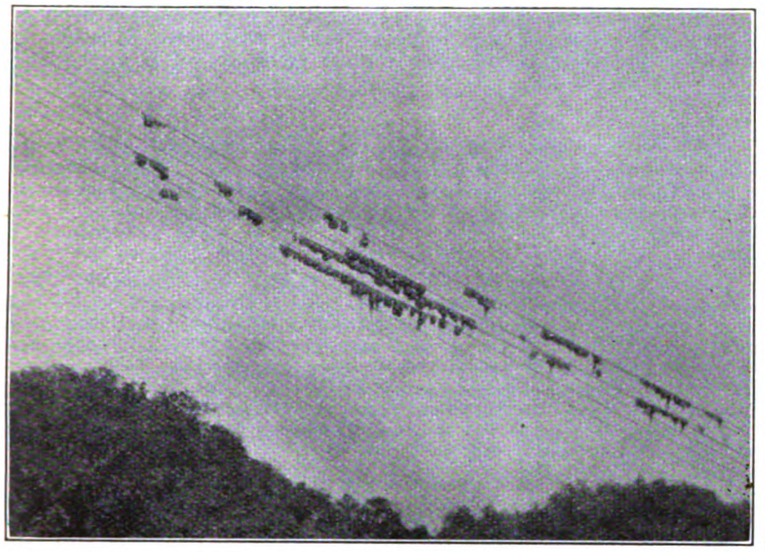
CORRESPONDENCE.

BIRDS' NESTS ON TELEGRAPH WIRES.

TO THE EDITOR OF "THE TELEGRAPH AND TELEPHONE JOURNAL."

DEAR SIR,—The enclosed photograph may be of some interest showing what the Indian Telegraph Department have to contend with in trying to maintain telegraph communication in that country. The photo shows a number of bottle birds' nests built on the telegraph wires in Assam. It must



not be assumed that the wires are usually in this condition. The nests were allowed to grow for four days specially for this photograph. It shows the rate at which these birds can build. Ordinarily, during the nesting season, the wires are cleared daily. Snakes, entrails dropped by kites and vultures, and flying-foxes are amongst other things which the line-staff in India have to contend with in maintaining telegraph communication in that country.—Yours truly,

B. WIENICK,
Director of Telegraphs, India.

Guildford, July 8.

TELEGRAPHIC ZONE SYSTEM.

TO THE EDITOR OF "THE TELEGRAPH AND TELEPHONE JOURNAL."

Dear Sir,—Numerous suggestions for increasing telegraph traffic have been submitted and made public through these columns, but practically all are based on the assumption that to wipe out the deficit, Peter must be robbed to pay Paul.

If I may express an opinion, the zone tariff suggested by Mr. Binder, of the A.G.D., although the best yet, would probably fail for more reasons than one.

I predict that no matter from which geographical point a business man operates, his telegraphic accounts in a given space of time would be heavier than hitherto; which, of course, is your correspondent's idea.

But in previous correspondence it has been pointed out that, whatever may be said in the House, the loss on telegraphs is of no concern to the public—people simply pay for their messages to be delivered at the utmost speed. They have not the least desire to know the reason for declining traffic receipts. Those whose telegrams are destined for long journeys (disguised as zone areas) would, I should imagine, be rather uncomplimentary when told that "the purpose of the extra charge is to try and show a profit." Poor consolation to be informed that it has cost the gentleman who has just handed in a message for Eastbourne only 9*d*. !

The occasional sender hands in his message for (say) Scotland. Be he a native of that country, he will have something to say. The business man operating from London, or any commercial centre, may probably find it very difficult to discover clients, agents, or customers, sufficient in number, and within the three-farthing zone, to balance the extra charge on his messages intended for further afield.

Apart from this, to balance the charges by a reduction here and an increase there might wipe out the deficit, but there the return would stick. Why not go ahead and show them business is meant? I know all about "public service," "not a profit-making concern," &c., but it is submitted that a profit—beg, pardon, surplus—would be unavoidable if such a scheme were introduced that would be of mutual benefit to Department and public.

Posting telegrams overnight has been the subject of criticism, and rightly so, perhaps, in the case of "twelve words a shilling." May I suggest that an inland "P.L.T." service be inaugurated at a deferred rate? It has been said that the cost of transmission exceeds the charge. Possibly—in much the same way that the cost of an article manufactured in small amounts greatly exceeds that of the same item produced *en masse*.

From my observations there are certain periods of the day when, although not idle, apparatus (not the human element) shows signs of inertia. Cannot an attempt be made to eliminate that waste of time? Half a loaf is better than none.

The periods mentioned are, of course, known; and if traffic is accepted at deferred rates for transmission at this time of day only, surely that would be more profitable than nothing at all. Moreover, it is my firm belief that in this question the utilising of time for the purpose of compiling a deferred tariff, will be found the simple solution to a very difficult problem.

C.T.O., April, 1930. W. T. L. (T.S.).

WESTERN DISTRICT NOTES.

Plymouth Fete.—The Telephone Staff at Plymouth held a most successful garden fete at Inceworth (by the kindness of Miss Mary Bayly, J.P.) on Saturday, June 28.

The day was as gloriously fine as a day can be in Devonshire, and the brilliancy of the affair was assured by the presence of Lady Astor, who performed the opening ceremony. The fete was held in aid of the Plymouth Postal Scholarship Scheme, whose aim it is to send at least one student every year to the University College of the South-West at Exeter. The scholarship this year was won by Miss Ruth Penny, the daughter of a postman at Totnes.

LADY ASTOR AT OPENING OF GARDEN FETE ORGANISED BY PLYMOUTH TELEPHONE STAFF.

Group includes Miss England (Secretary); Mrs. Berlyn; Mr. Berlyn (Head Postmaster); Miss Mary Bayly, J.P.; Miss Westlake (Chief Supervisor); Mr. A. O. Spafford, O.B.E.; Mr. Horwill; Mr. Edgecombe (Assistant Postmaster); Mr. Rogers (Chairman of the Fund); and Mr. Emms (Head Postmaster, Totnes).

In the course of her speech Lady Astor commended the telephone operators for their courtesy and helpfulness.

Mr. A. L. E. Berlyn, Head Postmaster, Plymouth, presided, and other speakers were Mr. E. G. Horwill (the mainspring of the scheme), Professor Honox of the University, Mr. W. J. Rogers, Mr. Emms (Head Postmaster, Totnes), Capt. Bannister (Sectional Engineer), and finally, Mr. A. O. Spafford, O.B.E., Surveyor, Western District.

The festivities were carried on continuously from 2.30 p.m. till 10 p.m., visitors being entertained by the Tramways Band, and delightful exhibitions of dancing by the pupils of Mrs. Pinch.

There were numerous stalls and sideshows, also beauty and ankle competitions for the ladies and a hat-trimming competition for the men.

The Committee and especially the Fete Secretary, Miss Daisy England, must be well pleased with the result of their efforts, which produced £64 for the fund.

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This educational scheme is attracting attention in many quarters, and in addition to receiving many enquiries from towns in the British Isles has received an enquiry from South Africa.

During the day it was learned that Miss Bayly's father had one of the first, if not the first, domestic telephone circuits in this country. It appears that Professor Graham Bell, while in Plymouth in 1877, for the purpose of demonstrating his invention, stayed with Miss Bayly's father and fitted up for him a telephone circuit between the house and stables in order that the coachman or gardener could be summoned to the house. It was very apt that Miss Bayly should now be associated with a Telephone Fete.

Exchange Names.—The notes in the June issue, under the heading "We Telephonists" on exchange names, provoked reflections on some of the names of exchanges in the West Country. Bovey Tracey, for instance, sounds romantic, and indeed, the second part of the place-name is traced to a de Tracey who was concerned in the murder of Thomas à Becket. Then Tintagel and Camelford (the Camelot of legend, 'tis said) revive memories of the Arthurian legend.

Bishops Caundle, Bishops Lydeard, Charlton Mackrell, Cheriton Bishop, Chilton Polden, Corton Denham, and many other such, suggest an aristocracy of place-names having their origin in medieval times.

Glastonbury is another name that conjures up the dim past when waiting for the number one had called on that exchange.

We find the Saints well represented, for have we not St. Agnes, St. Budeaux, St. Buryan, St. Just, St. Tudy and many more.

Quite recently an exchange was opened at Mousehole. Surely this name must come from a fairy story or nursery rhyme.

Then there are the quaint and curious names. Downderry, for instance, how did this slip out of Ireland into Cornwall ? Ipplepen, Lostwithiel, Marazion (meaning Jews Market), Perranarworthal, Stogumber, and Sticklepath, how quaint they all sound.

We in the West have no Royals, Waterloos, Centrals, Citys, and the rest, but then who wants them when we have those mentioned above and many more like them.

F. J. F.

READING NOTES.

THE staff of the Traffic and other branches of the District Manager's Office assembled at King Edward Buildings on Saturday, April 12, to say farewell on the occasion of the retirement of Mr. JAMES SPLATT from the service and his departure to Vancouver.

The District Manager, Mr. C. F. Moorhouse, in asking Mr. Splatt's acceptance of a cabin trunk and expanding suit case paid tribute to the faithful service rendered in his capacity as Assistant Traffic Superintendent and the many difficult cases he had steered to a successful issue. Mr. Vaughan (Traffic Superintendent), Mr. Young (Contract Manager) also paid tribute to Mr. Splatt's personality and the genial manner extended to all. Mr. Splatt suitably responded with much feeling.

On April 29 the staff again assembled in King Edward Buildings to say goodbye to Mr. STANLEY A. YOUNG, who had been promoted to District Manager of Aberdeen. Mr. Luscombe, in asking Mr. Moorhouse to make the presentation, remarked he was sure that he, Mr. Moorhouse, felt proud that Head Office should have selected two of his Staff, i.e. Mr. Edward (late Traffic Superintendent) and now Mr. Young, to be District Managers, within a space of two years, which showed that the Reading District was held in esteem by Head Office. Mr. Moorhouse, in making the presentation, eulogised Mr. Young's sterling work in the Contract Department during his stay in Reading, and said he was proud of the fact that two District Managers had been appointed from his staff. Mr. French, Staff Officer; Mr. Vaughan, Traffic Superintendent; Mr. Frame, Assistant Traffic Superintendent; Mr. Mullens of the Engineering Staff also congratulated Mr. Young.

Mr. Young responded, and emphasised that without the loyal co-operation of his Contract Staff he could not have secured the honour now conferred upon him. The presentation consisted of a gold watch suitably inscribed, a gold Eversharp pencil, and a case of perfume for Mrs. Young. Mr. Young was also the recipient of a Parker Duofold pen and stand from a few of his friends outside the office.

The Reading District still continues to progress—by the time these notes are in print another milestone will have been passed—the District having reached 42,000 stations, which is very gratifying to all concerned.

Development in connexion with the succession of orders for private automatic branch exchanges is very satisfactory, one having been secured from His Royal Highness the Prince of Wales for his residence, The Fort, Virginia Water, the University of Reading and others.

Since the last notes appeared we have received a visit from the Royal Counties Show which was housed in the Prospect Park, loaned by the Corporation, and acknowledged by the Show authorities to be one of the finest sites which they occupy from year to year. Postal and telephone work during the Show exceeded that of other years. The Contract Branch were represented adjacent to the Show Ground Post Office, with a Contract Officer in attendance, who was able to give information regarding the service to numerous enquirers. A school automatic demonstration set, kindly loaned by The Telephone Development Association, was on view and created a deal of interest. Outside the Public Call Offices, exchange lines were provided for the railway companies, Reading Chamber of Commerce, and various prominent firms.

The new Contract Manager has been appointed in the person of Mr. W. S. Coulsell, from Aberdeen, and under his regime the Contract Department will receive the direction and guidance which we believe will be forthcoming.

The District Office Staff are now housed in their new offices at the eastern end of the town, and the change is welcomed by all those concerned, it being situated in one of the most healthy parts of the borough, and named the Sanitorium on account of its invigorating surroundings.

Social.—The Post Office, Telephones Cricket Club (Reading).—Two successful whist drives and dances have been held during the winter and were attended by a large number of the staff and friends. Mrs. Moorhouse kindly presented the prizes on each occasion. The M.C.s for whist and dances were Messrs. Luscombe and Watson. Fixtures have been arranged for the coming season, including return matches with the District Manager's Office, Guildford, and the St. Albans Engineers. The season is looked forward to with every confidence that the results achieved by the team last season will be repeated during this one.

The Cricket Club have so far had a successful season. The District Managers' staff from Bristol and Guildford have been met. The return matches will be looked forward to with interest. The visit to the Bournemouth Y.M.C.A. on Whit-Monday proved enjoyable, and the creditable performance against such a strong combination was regarded as very satisfactory.

SOUTH WALES DISTRICT.

A PRESENTATION was made on May 17 to Miss F. A. Dowdall, Clerical Officer, who has been voluntarily transferred to a similar post under the Ministry of Labour.

The presentation of a drawing-room 8-day clock, handbag, and silver photograph frame was made by Mr. R. S. Grosvenor, Traffic Supt., Class I, who referred in suitable terms to Miss Dowdall's 15 years' service and the popularity in which she was held by the staff.

Mr. Grosvenor's remarks were heartily supported by Mr. W. MacDonald, Traffic Supt., Class II, Mr. D. B. Hebenton, Assistant Traffic Superintendent, and Mr. W. H. Newcombe, Clerical Officer.

FOR OUR ADVERTISERS, &c., &c.

Australia, Melbourne. Aug. 19. Supply and delivery of telephone jacks (Ref. B.X. 6477). New Zealand, Wellington. Sept. 2. Supply of telephone bells (Ref. A.X. 9871) (Contract No. P. & T. 151 2418). Also Wellington. Sept. 9. P. & T. Dept. Supply resistance spools (Ref. A.X. 9867). Australia, Melbourne. Sept. 16. Instrument cords (Schedule C 627) (Ref. A.X. 9890), also switchboard cords (Schedule C. 626) (Ref. A.X. 9889). also supply insulated wire (Schedule C. 631) (Ref. A.X. 9879).

Reports Worth Reading.—That by Mr. E. Murray Harvey, O.B.E., Commercial Secretary, Santiago, prepared for the Department of Overseas Trade. Deals specially with Electrical Import Trade of Chili, difficulties of present-day market, and suggests line of action for Britishers (H.M. Stationery Office, price 3*s.*). Also Mr. W. J. Glenny's "Statistical Summary," dealing with economic conditions in Sweden (H.M. Stationery Office, price 1*s.* 6*d.*).

The Board of Trade Journal reports that the second radio exhibition will be held in Bucharest from Sept. 7 to 28. This exhibition is to include the products of all the branches of the "radiophonic" and "aerochemical" industries, but special prominence will be given to apparatus intended for military purposes. Inquiries should be addressed to the Comite d'Organisation, Exposition Internationale de Radio, Palais des Postes, Direction Radio, Bucharest.

J. J. T.

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LONDON TELEPHONE SERVICE NOTES.

Contract Branch Notes.

THE business done by the Contract Branch during the month of June resulted in a net gain of 757 stations.

The net increase in exchange stations for the six months ending June 30, 1930, amounted to 20,388.

Rural Automatic Exchange.—It is probable that by the time these notes appear the first Rural Automatic exchange in the London Telephone area will have been opened. The exchange will be known as Stapleford, and will serve principally, the attractively named and delightful and picturesque districts of Stapleford Tawney, and Stapleford Abbotts. The opening of this exchange will provide the most up-to-date telephone equipment to, amongst others, a group of farmers situated in the most remote part of the London Telephone area.

Names.—Development officers in the course of their work frequently encounter original ideas of builders to attract prospective purchasers.

In one district a builder commenced by erecting some houses which he called "Little Palaces." This was replied to by another who described his property as "Big Palaces." Not to be outdone a third launched out with "Mansionettes," and a fourth believes that he has outmanœuvred his competitors by advertising his houses as "Kingsbury Castles."

Whatever may be the virtues of the different builders' efforts, it seems to us that houses described by such delectable names can scarcely be complete without a telephone.

Promotions.—Our congratulations are offered to Messrs. Grant, Goodall, and Seeley on their promotion from Contract Officer, Class II to the rank of Contract Officer, Class I.

Retirement.—An informal gathering of the staff of the South East Contract Office took place on June 19, 1930, to wish goodbye to Mr. Peach, Contract Officer, Class II, on his retirement from the Service.

Mr. Peach, who joined The National Telephone Company, Ltd., in 1906, was presented by the District Contract Manager with a cheque subscribed to by his colleagues as a token of their good wishes to him.

Contract Branch Cricket.—Further progress has been made in the series of matches arranged in connexion with the Shield Tournament.

The last two matches played against the Messengers both resulted in wins.

In the first game, played at Chiswick, the Contract Branch team batting first, declared at 123 for 7 wickets, Goodger and Dickinson being top scorers with 36 and 26 respectively.

The Messengers, in reply, opened with a fine first wicket partnership which yielded 45 runs scored at the rate of two a minute.

Lester 20 and Hurley 23 proved, however, to be the only two capable of offering any serious opposition, and the whole side were tumbled out for 57 runs. Pearkes had the splendid analysis of 6 wickets for 11 runs.

In the return match, played at Battersea Park, the Messengers again fared moderately, and although several of the boys batted stubbornly, they could only muster 41 runs. These were easily knocked off by Doody 51 and Barnsley 18 not out.

It was pleasing to observe the good work of the Messengers in the field, some of their ground fielding being of a high standard.

The London Telephonists' Society.

The Committee of this Society have already been hard at work on the production of an attractive programme for the 1930-1931 Session, and they are featuring an evening devoted to a description of "Other People's Work." The "London Omnibus Service" and "Catering" are the two subjects chosen, and they will be introduced by experts in those commercial spheres, the lecturers being on the staffs of the London General Omnibus Company Ltd., and Messrs. J. Lyons & Co. Ltd. Another outstanding item of interest during the session will be a lantern lecture dealing with the processes employed in the manufacture of automatic telephone apparatus and some sidelights on the other uses to which such equipment is put, for example, the "Totalisator." Then, too, Mr. W. C. Griffith has undertaken to relate some of his experiences whilst investigating the question of long-distance telephony in America. The annual dance is to be held at Coventry Street Corner House in January, 1931, and a Telephone Play, burlesquing some of the diverting happenings in official life, will be presented in April. "Laugh and Keep Slim" is the motto of the author, Miss J. M. McMillan, who has once more undertaken to devote her spare time to making and mixing the ingredients.

The Elocution Competition is always a draw, and this Session it is to be organised on an exchange instead of an individualist basis. A trophy suitably inscribed will be presented to the winning team and will be held at their exchange for one year. A personal prize will also be awarded to each member of the successful team.

The Committee of the Society guarantee enjoyable evenings to those who attend and hope that an increased membership will reward its efforts.

London Telephone Service Sports Association.

The first annual sports meeting was held on the Chiswick C.S. Ground on Friday, July 18. Promptly at 5 o'clock the first race commenced, and except for a few minutes interruption due to the rain, event after event went with a swing until 8.15. There were over 500 entries and 30 items. The results were as follows :—

Veterans' 100 *Yards Race.*—1, F. Moyle ; 2, H. A. Hamilton ; 3, C. D. Upham. Prizes kindly presented by Mr. M. C. Pink.

Men's Half Mile Handicap.—1, G. C. Brooks ; 2, H. S. Read ; 3, J. Greenway.

Girl Probationers' Race.—1, Sipthorpe ; 2, E. V. Burton ; 3, H. Beaves. Prizes kindly presented by Miss J. Liddiard, M.B.E.

Throwing the Cricket Ball (*Ladies*).—1, H. Beaves ; 2, V. J. Bannister ; 3, B. Searle.

Throwing the Cricket Ball (*Men*).—1, E. W. Sweetingham ; 2, J. Cameron ; 3, G. J. Moon.

Children's Handicap.—Boys.—1, Stanley Smith.
Girls.—1, D. Culley.

Boxes of chocolates were presented to all other runners by Messrs. Nestle & Anglo-Swiss Condensed Milk Co.

Wheelbarrow Race (*Ladies*).—1, D. Parsons—Burgess ; 2, Kinnear—Bolton ; 3, Carter—Pollard.

100 *Yards Scratch* (*Men*).—1, A. D. Rollins ; 2, H. S. Read ; 3, E. W. Sweetingham.

Invitation Relay Race (*Ladies*).—1, L.T.S. ; 2, Ministry of Health ; 3, Inland Revenue.

Match—Girl Probationers v. *Boy Messengers : Teams of* 4.—Girls 100 yards, Boys 110 yards.—1, Boy Messengers : E. G. Waters, W. Hurley, S. Mackenzie, and T. Dickerson. Prizes kindly presented by Mr. R. Tinniswood, O.B.E.

Tug of War.—Won by Accounts Branch.

Boy Messengers' Race : 100 *Yards.*—1, E. G. Waters ; 2, W. Hurley ; 3, S. Cooke. Prizes kindly presented by Mr. W. R. Bold.

Inter Branch and Exchange Relay Race (*Ladies*).—1, Trunks(A) ; 2, Putney ; 3, Ealing. Challenge Cup presented by the Clerical Officers' Association.

Inter Branch Relay Race (*Men*).—1, Traffic Branch.

Egg-and-Spoon Race (*Ladies*).—1, C. Harknett ; 2, H. Beaves ; 3, D. Frost.

Sack Race (*Ladies*).—1, M. Newling ; 2, D. Boothby ; 3, P. Pidgeon.

100 *Yards Scratch* (*Ladies*).—1, M. Menzies ; 2, D. Uglow ; 3, J. L. Rosier ; 4. V. J. Bannister.

High Jump (*Ladies*).—1, D. Uglow ; 2, —. Searle ; 3, V. J. Bannister.

Three-Legged Race.—1, R. Fowler—L. Alward ; 2, G. M. Jones—J. L. Rosier ; 3, P. Clapham—D. Davenport.

Although there were no records broken there was some very good running. Trunks (A) gave a splendid display in the Inter-Branch and Exchange Relay, and well deserved the C.O.A. Trophy and the replicas of the Cup presented to the members of the team. The Ladies Invitation Relay Race was another excellent event, and the L.T.S. team once again proved their superiority to all comers. The match between the Girl Probationers and the Boy Messengers came about by the former challenging the latter, but in spite of each girl in the team receiving 10 yards, they failed to attain their object of beating the lads. There were no less than 10 heats in the 100 Yards Scratch Ladies' Race.

Miss Menzies, of Ealing, was an easy winner, her time being 11.4. Over 60 competitors entered for the Egg-and-Spoon Race, and there were 8 heats of 7 pairs in the Three-Legged Race, which proved that these events were as popular at the L.T.S. sports as at similar meetings.

The prizes were distributed by the Controller, who expressed his surprise and delight at such a gathering. He felt sure that as a result of that evening the Association would make the occasion an annual event, as future success was undoubtedly assured. Before concluding, Mr. Napier took the opportunity of handing over to the Ladies' L.T.S. Team the Civil Service Challenge Cup which they had recently won and also held in 1929.

Mr. Smallwood of the C.S.S.A., who acted as Chief Judge, followed and encouraged the Association by his appreciation of their successful effort. He called for much warmer support from the staff on future sports days.

Mr. Hugh Williams proposed a hearty vote of thanks to the Controller and to all who had helped to make the meeting such a success.

Special reference should be made to the attendance of a contingent of the L.T.S. Ambulance Corps, who rendered first aid to a number of competitors ; the injuries, fortunately, were not of a serious character.

Tennis.—The annual competitions for the "Cox" Cup (Ladies' Doubles) and the "Pink" Cup (Ladies' Singles) are still in progress, and supporters as well as competitors are reminded of the finals for both cups at Chiswick (Civil Service Ground) on Saturday, Sept. 20, at 2 p.m.

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Personalia.

Resignations on Account of Marriage.

Assistant Supervisors, Class II.

Miss M. M. E. Tanner, of Purley

Telephonists.

Miss M. M. T. McGlennon, of Purley.	Miss W. M. Horwood, of Paddington.
„ B. E. Abbott, of Temple Bar.	„ A. Pullen, of Paddington.
„ E. E. Hearn, of Temple Bar.	„ M. D. Moyse, of Flaxman.
„ M. Ludlam, of Richmond.	„ M. Tompson, of Harrow.
„ E. I. Parry, of Maida Vale.	„ M. A. Luxton, of Bishopsgate.
„ M. I. G. Grammer, of Victoria.	„ M. E. Brigden, of Bishopsgate.
„ I. F. Fussell, of Victoria.	„ E. V. Hollands, of Sydenham.
„ D. A. Walker, of Victoria.	„ K. Lambourne, of City.
„ E. M. Webb, of Victoria.	„ O. Parsons, of City.
„ E. M. Williams, of Museum.	„ W. Lynch, of City.
„ N. F. Gare, of Museum.	„ M. K. Tomlin, of Croydon.
„ M. W. D. Webster, of Toll "B."	„ A. A. Slade, of East.
„ V. M. King, of Tandem.	„ E. M. Cave, of East.
„ L. E. Carter, of Tandem.	„ A. B. Dorman, of Avenue.
„ W. E. P. Godfrey, of Maryland.	„ E. Graham, of Hop.
„ V. Lawrence, of Trunks.	„ C. A. Clarabut, of Hop.
„ L. M. Boughton, of Trunks.	„ E. Lanford, of Hop.
„ A. Pudney, of Trunks.	„ P. Woodhead, of Hop.
„ E. M. Moore, of Trunks.	„ E. M. Mitchell-Dwelly, of Gerrard
„ E. Knight, of Central.	„ E. G. Harsant, of Wanstead.
„ C. M. Davies, of Central.	„ D. A. M. Sedgwick, of Wanstead.
„ M. L. Johnson, of Central.	„ R. E. Daniell, of Waterloo.
„ Dorothy M. Brown, of Central.	„ A. C. E. Denny, of Streatham.

C.T.O. NOTES.

Promotions.—Mr. P. E. Crisp, Overseer to Asst. Supt. (Cable Room).

Retirements.—Mr. F. J. Taylor, Superintendent Lower Grade; Mr. H. Parker, Overseer.

Obituary.—We regret to announce the death of Mr. W. J. Carter, Telegraphist, who passed away on June 3, and to whose widow we extend our sincere sympathy.

Rambles.—The "F" Division second ramble of the season was once more in Surrey, Mickleham being the venue. Although rain set in for a time, the walk over Mickleham Downs was most enjoyable.

Sports: Cricket.—On Wednesday, July 2, the "Centels" visited Southampton in the Third Round of the Curtis Bennett Shield.

Sir Russell Bencraft, J.P., president of the Southampton C.S.C.C., welcomed us at lunch with a few entertaining remarks to which Mr. H. W. Dunne, of ours, suitably replied.

Southampton won the toss and fared badly, losing their first four wickets for 11 runs. J. Crookes then came to the rescue, and batting magnificently scored 94. But for his display the Centels would probably have won by a much bigger margin. S.O. were all out for 169, W. T. Cook taking 4 wickets for 46. W. T. Cook and W. Drummond opened well for the Centels, and the total was carried beyond the 50 before Cook was out to a good catch. E. J. Harman then joined Drummond and played a very steady innings. In spite of continued bowling changes we passed into the fourth round by the margin of three wickets. Drummond was top scorer with 53, Harman contributed 27, and Cook 24. For S.O. J. Crookes took 3 wickets for 9, W. Hodgetts and R. Russell each 2 for 53.

We all thoroughly enjoyed the day and appreciated to the full the kindness and hospitality extended to us, and hope that the future will afford us an opportunity for showing our feelings in a more tangible way.

Annual Sports.—The Centels held their Annual Sports at Chiswick on July 11. There was only a fair attendance, and probably the weather which, although unsettled, eventually turned out bright, had something to do with this. Mr. and Mrs. Stuart Jones attended and Mr. D. M. Ford, the late Deputy Controller, was also present. Mrs. Stuart Jones kindly presented the prizes.

Invitation Relay Race, 880 yards, 440 yards, 220 yards, provided a very fine race, the Customs and Excise winning from the Imperial and International Communications Company.

Briefly the results were as follow:—

Inter-Divisional Race: Women—Winners "L" Division.
Inter-Divisional Race: Men—Winners "D" Division.
One Mile Championship—L. Sowden.
660 Yards Cycling—A. H. Fewell.
One Mile Cycling—A. H. Fewell.
100 Yards Handicap: Women—Miss M. Badderly.
The "A. E. Knowles" Cup was won by the Central Hall.

The Side Shows proved very attractive.

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Woe in the Wooing.

THE sea kissed the shore: kissed with the quiet, gentle fervour of a lover. The shore seemed to accept his caress with a shy eagerness, timid, half-resisting but surged with joy. And yet there was a masterful, possessive air about him which somehow made her afraid, tinged her answering smile of welcome with sadness and made her pride seem rashness. Sometimes he would rush boisterously to keep his tryst with her and then each would embrace passionately and with abandon. The air would ring with a wild music, the wind would crest him with a majesty and would bend the coarse grasses as in adoration of an advancing hero. But to-day they were langorous—one might have thought them to be indifferent to or oblivious of each other. The sun that burnished her gold and silver, flecked him with a myriad lights as he lay idle and complacent beside her. The ripples seemed merely evidence of a subtle restlessness and quiescent power. They smiled together over the past; they dreamed of the future and the present that was theirs seemed more remote than either. He whispered of his departure and of the treasures he would bring on his return. He would deck her with seaweed of wondrous lustre and texture; he would fringe her with ribbon of the purest white; he would strew dainty shells and bright stars at her feet and the pebbles should sing at his touch. He would leave behind for a remembrance soft pools which should reflect the glory of the morning, the pagentry of the skies, the riot of the sunset and the pale peace of the moon. They should be miniature gardens of the deep. Tiny fish should lurk in their shadows; small crabs should flit and burrow and even the limpet should lift its shell and peer cautiously. And then, when he returned, he would take her for his own, for ever—and none should separate them.

The surveyor and the engineer came and they plotted. They brought cranes, steam shovels, pumps, iron girders, timber baulks, concrete and stone blocks. They made a road and a pavement with a granite curb, and by the water-side they planted iron railings. They erected fanciful lamp-standards, and laid out gardens with lawns and flowers and seats and artificial rockeries. "This," they said, "is a Parade." And while visitors beheld the offensive defences and exclaimed, "This is a Coming Resort—a Rising Watering-Place," the inhabitants said, "Let us pull down our barn and build an hotel or a boarding-house, and let us call it 'Sea View' because it is so." The children said, "This is not the sea-side; there are no pools or sand"; but their mothers and fathers and uncles and aunts said, "Rubbish—this is the sea-side; look, there is the bandstand."

One night the sea returned, joyous in anticipation. He ran, he leapt, he tossed, until with swift easy strides he reached—a wall. He halted, receded, advanced, retreated, piled high, crouched low, pawed the rough beach and cast stray timbers away contemptuously. Patiently he waited; he knocked, he listened; he hunted, at first curiously, then anxiously, then frenziedly. This was the trysting-place; where was the shore, his beloved? Was she hiding in a teasing mood; had she proved faithless? He seemed to sink back in despair; he became sullen and then, as hope faded, the latent passion blazed. He raged, he roared, he hurled himself madly against the wall; he sobbed, he struggled, fought, tore, battered, crashed, boomed, cursed, massed his foaming chariots and charged like thunder. He called upon the tempest and the wind howled his fury, the rain hissed in hate. The lightning jagged the sky and seared the blackness. But the wall stood like an implacable gaoler and the fair shore remained imprisoned for ever.

Now when the courage of the day has departed and the mystery of night descends, the sea takes on a sinister look, seeking, ever seeking and never finding, clawing at the wall, glaring evilly, showing its fangs, snarling, threatening, heaving; restless, passionate, treacherous; snatching here and there, breaking spitefully; cold and pitiless. And the cold and pitiless bandstand remains as a painted Jezebel mocking the sea and his lover.

PERCY FLAGE.

A Visit to the Rosa Morrison Hospital.

When my chief told me my name had been drawn as one of those accompanying Miss Cox to a Garden Fete, I felt Thursday must be a lucky day for me. I knew we should enjoy ourselves, for I had been promised a very pleasant afternoon when asked if I should care to go.

We met Miss Cox at Marble Arch at half-past two, where a lovely car was waiting to take us to the Rosa Morrison Hospital, Barnet. Our arrival was well timed, for the opening ceremony was about to be performed, after which Miss Cox presented us to Lady Plender, whose guests we were.

The stalls held a variety of goods from which we made several purchases. I think the "Lucky Dips" were most popular and caused some fun. They included a peg-bag, bottles of coloured ink, bath salts, &c. Children dressed in smocks and print frocks, and folk danced on the lawn, and a ladies' string band provided music.

Matron took us over the hospital and nurses' quarters. It was visiting day, so you can guess we were not the only people in the wards, of which there are four. The cream walls, blue curtains and bedspreads were such lovely soft shades, and had a very pleasing effect. The gardens were beautifully kept, especially the kitchen garden. When matron told us one gardener did it all by himself, and out of each week spent one day taking patients to and from the hospital, we were astounded. The man must love his work for he seems to have coaxed every wee plant and flower to do its best for him. The night nurses have their quarters (which is a large hut divided into two rooms) in the paddock adjoining the hospital. We inspected these and found the same colour scheme and air of restfulness, which is needed especially for those who have to turn day into night.

After our tour round we were given a delicious strawberry tea, goodbyes were said, and we were driven home.

One feels the need of personal service and financial help after visiting such a hospital. Health can never be bought, so those of us who are well and strong should do all we can for the less fortunate.

J. F. EVANS, *Clerkenwell.*

There once lived a fellow named Bell,
He is dead: you may say "Just as well!"
He invented the 'phone,
Which some grumblers will own
Should ensure him a warm place in—Harrow.

P.D.'A.

Contributions to this column should be addressed: The Editress, "Talk of Many Things," *Telegraph and Telephone Journal*, Secretary's Office, G.P.O. (North), London, E.C.1.

GLASGOW TELEPHONE NOTES.

WE extend a hearty welcome to Mr. E. B. M. Lord on his arrival at Glasgow to take up duty as Traffic Supt. (II), to which grade he has been recently promoted. He does not come as a complete stranger, for, besides knowing and esteeming those whom we know and esteem, he renews acquaintance with his present District Manager, with whom he served in Liverpool several years ago, during his traffic training period. Mr. Lord comes with a reputation as a player of Ye Antiente and Royall Game, at which he will find no lack of opportunity to exercise his skill.

Marriages.—

Miss N. McLean, Ibrox.
„ M. McWhinnie, Douglas.
Miss M. Wilson, Central.
„ E. O. Stag, Bridgeton.

I have no Muse,
Dear Mr. Law,
My brains refuse,
Dear Mr. Law,
To do a stroke
Of work. A joke
They cannot make
E'en for your sake.
So you must pen
This month again.
The *Journal* news.
I have no Muse!

M. L. TULLOCH.

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Can Aberdeen Beat It?—The little red lamp glowed for the first time that morning. The operator, using a modified cord with intensified speed, answered the call and rang the number desired. Suddenly the caller abandoned the call. Supervisors stood by for the inevitable. With a smile in his voice, however, the caller volunteered the information that it was not his intention to converse. His friend would be now awake and well—that was that.

Accounts Branch threepence down.

An hour later the same caller—the same number called. Revenue at last?

Alas, no! On "No reply" being communicated the caller expressed complete satisfaction with the telephone (bell) service. His earlier "alarm" had been effective. His "open sesame" coins were once more in his pocket.

One satisfied subscriber is worth his weight in gold (Service Instructions, 2B) hence the loss is more apparent than real. (Auditors, perhaps, may agree.)

The operator, however, being real, apparently wished him an unmendable hole in his trouser pockets through which nothing less than threepenny bits could escape—apart altogether from the standard expression regarding all his rabbits dying.

S. D. HUTTON.

"The District Manager,
"Post Office Telephones.

"Dear Sir,

"THINK OF A NUMBER.

"I have taken a house at 27, Fotheringay Road, Pollokshields, and, quite frankly, I do not like the present telephone number. It is King's Park 1407. By no association of ideas do I like it and it is the one blemish in the last act of what has been a romantic acquaintanceship with my future wife. I am sure she also will never like it, and I feel that so amazingly illogical are women that every slight mishap with which the 'phone is even remotely associated, will be blamed upon me as the acceptor of the number. In the year 1407 Henry the Fourth was conducting a series of battles with the French, and I would not like to be reminded of battles every time I thought of the house telephone.

"I do not mind King's Park 1930, because I hope that will have happy recollections for me, and at the same time enable me to prove to my friends that 1930 does not divide by four, and that actually I had some slight voice in the matter.

"My girl belongs to what a certain political party call 'the villa population.' The number of the house in her row is '33.' Could we, Mr. District Manager, by any chance, have King's Park 33?

"Or again, the number in Craigmont Road of our house is '27.' Could we have that number? It would be ideal. In fact, if you gave us that number you could invite yourself out at any time to come and try my wife's cooking. No, I should say 'cooking under the direction of my wife.' That, as far as I am concerned, constitutes one of the risks of the whole enterprise, and in coming to the meal you would require to invest yourself with the spirit of adventure.

"Another good idea would be King's Park 10, because I am informed by married men who are old campaigners that it is not only children who have to count up to that number.

"Will you please see what is the very best you can do for us, and if you would like it you could come and discuss the matter with my girl and me at lunch some day. You are sure to like her. She was educated at a very exclusive boarding school in Edinburgh, but you would never know it; that is a deliberately ambiguous statement, although I should, perhaps, mention that my girl has repeatedly assured me that at least twice at school serious education was attempted for an afternoon, but on both occasions the one girl who paid any attention was described as 'a blackleg'—demonstrating that organised labour has no monopoly of the word.

"May I explain that my girl and I have been very good customers of the Post Office for some time past and have been wondering when we are to receive a dividend. The Post Office, in fact, is an important item in the high cost of loving—pronounced the Glasgow way, this makes rather a neat pun. The fact of our actually being married will have a serious effect upon the Post Office estimates for the current year, and may actually necessitate Parliament granting a supplementary vote. Please, however, do not report this to Mr. Snowden, as we both feel he has quite enough trouble on hand at the moment without this being added to his anxieties.

"In conclusion, and in order that you may know all about us, if we appeared in 'Who's Who' our respective entries would be as follows:—

"Gilchrist, Alexander.—Born Sept. 5, 1895; Chartered accountant; Clubs—National Liberal, London and 'Blank,' Glasgow; Author of Textbook on Taxation; Sports—golf, tennis and badminton.

"H——, Irene.—The nicest girl in the world.

Mr. District Manager, we both appeal to you."

(Sgd.)

MANCHESTER NOTES.

JUNE 7, 1930 was a red letter day in Manchester telephone history. That day saw the opening of the Toll Exchange at Telephone House, and the inauguration of the Director Auto System. The first exchanges to be opened under this system being Ardwick, Collyhurst, and Moss Side, the forerunners of the extensive scheme which is being applied to Manchester, and incidentally the first auto exchanges in the Provinces to be opened under the "Director" system.

Everything was carried out "according to plan" and there were only 8 faults of a minor character in the transfer of over 4,000 lines.

Promotions.—The undermentioned promotions have taken place in the District:—

Mr. W. Basquill, Contract Officer Class II, Manchester, to Contract Officer Class I, Manchester.
Mr. J. Hindley, Contract Officer Class II, Manchester, to Contract Officer Class I, North Western District.
Miss W. Hope, Writing Assistant, Manchester, to Clerical Officer, Manchester.

On Saturday, June 14, Mr. McCormick, Traffic Supt., Class II, said "Goodbye" or rather "Guidbye" to us all and left to take up the position of Traffic Supt., Class I at York.

At a happy little ceremony in the Telephone Dining Room the District Manager (Mr. J. T. Whitelaw), on behalf of the Telephone Staff, and as a token of their esteem, presented Mr. McCormick with a gold watch.

Mr. Parry spoke highly of Mr. McCormick's work in connexion with the automatic transfer, and congratulated him on his promotion. He remarked that the presentation was unique in that we had witnessed one Scot giving something to another.

In a number of snappy speeches members of the Traffic Office tendered the best wishes of the Manchester Staff for Mr. McCormick's happiness and prosperity in his new post. Mr. McCormick responded in a short, sincere, and thoughtful speech, typical of the quiet personality which has endeared him to us all.

On Friday evening, June 27, a very jolly party of the Manchester Telephone Staff gathered at the Exchange Hotel to say farewell to Mr. Parry and to congratulate him on his promotion to the post of District Manager, Birmingham.

There was a large attendance of the Manchester Traffic and Clerical Staff, while colleagues from the Liverpool, Preston, and Chester Districts had made long journeys in order to be present.

The District Manager kindly consented to act as Chairman.

After an excellent supper members of each of the Traffic Sections paid tribute to Mr. Parry's genial personality and inspiring leadership of the Manchester Traffic Office, and congratulated him upon his well-earned promotion.

There followed a series of charming speeches by the visitors from the surrounding districts; each recalled some earlier association with Mr. Parry in official or association activities, and all spoke highly of his wide knowledge, his willingness to share that knowledge, and his tireless application to the many tasks which he had undertaken.

After expressing his thanks for Mr. Parry's assistance during his 5 years in Manchester, Mr. Whitelaw, in a very interesting and humourous speech, welcomed Mr. Parry to the ranks of the District Managers, but warned him of the pitfalls that awaited him in his new sphere. Mr. Whitelaw's sketch of the hard lot, the trials and tribulations of the District Manager was very fine, and we were surprised that Mr. Parry continued to look so cheerful.

In reply, Mr. Parry thanked the staff for their expressions of goodwill and for their loyal support during his period of office at Manchester, but disclaimed many of the complimentary references, and said that his promotion was a recognition of the work of the Manchester Traffic Office as a whole.

The District Manager then proposed the toast, "The future health and prosperity of Mr. Parry and his family," and this was responded to with acclamation.

Several songs were then rendered by Mr. Williams and Mr. Clutterbuck and humourous items by Mr. Caro. Mr. Kemp sang a new song in which the secret vices and shady habits of his traffic colleagues were exposed, and an action for libel, we believe, is pending. Between each item the whole party joined in old-time choruses and sea shanties, a memorable evening being brought to a close with the singing of Auld Lang Syne.

On Saturday morning, June 28, representatives from all branches of the Manchester Telephone Staffs gathered in the Dining Room at Telephone House, and on their behalf the District Manager made a presentation to Mr. Parry of a cigarette case, a set of gold studs, a china coffee service, and a set of cut glass wine glasses.

In addition, Mr. Parry was the recipient of the following gifts from the large exchanges:—

A set of cut glass tumblers from the City and Central Exchanges.
Meerschaum pipe and pouch from the Trunk Exchange.
Tea-wagon from the Toll Exchange.

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We take this opportunity of again expressing our delight at the recognition of Mr. Parry's sterling worth and congratulate Birmingham on its good fortune in securing his services as its District Manager.

We are pleased to record the promotion (without transfer) of Mr. Battersby from Assistant Traffic Superintendent to Traffic Superintendent Class II at Manchester.

Retirements.—Members of the District Manager's Staff, and particularly the Contract Section, regret that Mr. N. V. Manning, Contract Officer Class II, has had to retire from the service on the grounds of ill health.

Mr. Manning's charming personality endeared him to all members of the staff, and their heartiest wishes for a speedy restoration to health go to him in his retirement.

LIVERPOOL NOTES.

AFTER a year's working the inter-insular telephone traffic between England and the Isle of Man has shown a satisfactory increase. Discounting the first week, when there was an exceptional number of calls in the direction of the smaller island, the early season traffic for 1930, although the season is not regarded as a good one, indicates a steadily increasing use of the service.

There are now five trunk circuits working between Douglas to and from Liverpool and Manchester terminated on two trunk signalling positions at the Douglas Exchange.

Reference to the special traffic arising out of the Tourist Trophy Races is made in an article by Mr. David, of Liverpool, who supervised the traffic arrangements.

After five days' play on the Wallasey and Royal Liverpool (Hoylake) Golf Links the Open Golf Championship came to an end. In order that the play might be closely followed and the public kept advised through the Press, special Press circuits were provided, 12 such circuits being installed at Hoylake and 4 at Wallasey. In addition, the trunk circuits between Liverpool and Hoylake were increased by two and two special circuits were made up for the British Broadcasting Corporation from their studio in Liverpool to the Hoylake golf course. The traffic was handled to everybody's satisfaction.

Mr. W. E. Gauntlett, the District Manager of Liverpool, while on a short golfing holiday in the Isle of Man recently accomplished the rare feat of holing out on the 10th hole on the Fort Anne golf links in one.

NEWCASTLE-ON-TYNE AND DISTRICT NOTES.

AN appeal is made to the local readers for contributions to these notes and to the pages of the *Journal* on matters of interest either of a social or technical character. Contributions should reach the local agent on or before the 15th of the month.

Telegraphs.—We have recently lost the services of Mr. A. L. Henderson (Overseer) due to retirement, and we wish him many happy years of leisure in his new home in British Columbia.

His consistent championship of all staff interests and his consideration and capacity as a controlling officer merit the deep appreciation which the whole staff accorded him.

Telephones.—If the sincere good wishes of the staff can do anything for Miss L. J. Keys (Asst. Supervisor, II, Relief Exchange), who recently left us to be married, she will have a delightful and happy future. Apart from a bright and attractive personality, she had gained the highest esteem and not a little affection, through her outstanding sense of justice, fairplay and honesty.

Undoubtedly, the department lost an excellent officer, who won from her staff a high standard of efficiency. Time and space do not permit us to set forth her countless qualities, all the luck was on our side in having her as our colleague and enjoying her fine comradeship.

Before leaving the district Miss Keys was the recipient of handsome gifts from the Relief staff, and from the staffs at Central, Trunks and other Exchanges.

The district office lost a popular member of its staff by the transfer of Miss Dorothy Ince to the Ministry of Labour. We feel sure that she will do well in her new sphere and she carries with her our best wishes for the future.

Miss Ince was presented with a handsome crystal dressing table set before leaving.

ABERDEEN NOTES.

WE in Aberdeen have only just realised that we can obtain *free* space in the *Journal*.

This fact is not surprising when it is considered that in Aberdeen the word "free" has long since fallen into disuse. We are, however, now quick to seize our opportunities.

On May 1 we welcomed our new District Manager, Mr. Stanley A. Young, promoted from Contract Manager, Class I, at Reading. His first official journey must have been regarded somewhat in the light of an adventure.

It so happens that we are in the midst of an exceedingly large extension scheme in the north west of Scotland, where at present telephones are unknown, and it was a journey of this sort that introduced Mr. Young to the Highlands. 850 miles were undertaken in less than a week over roads some of which are considered too risky for the Scottish Motor Trials—roads where one can travel for 20 miles without seeing a habitation or a human being. One will certainly see hundreds of wild deer and thousands of grouse. Where at times whiskey is as necessary as good tyres and good brakes, where one has to climb up "the side of a house," as it were, and down the other side. In good weather a great and invigorating adventure: in winter a frozen Hades. (Pardon the mixed metaphors.)

Britain is quickening to the beauty of the Highlands, and incomparable sights are waiting to be received. The majestic effect of mountains such as are seen close at hand at Kinlochewe and Loch Torridon amaze one, and one must perforce tarry and realise one's own impotence and smallness.

This is not a free advertisement for summer holidays, but is an attempt to put on record the sort of territory where, in the Aberdeen District, we get some of our telephone orders. During the next few years the Highlands will undoubtedly become the playground of Britain. Good roads and good hotels are coming, and where the *telephone goes, there necessarily go improvement and progress.*

GLOUCESTER NOTES.

Retirement of Mr. W. J. Norman.

ON Mar. 29 last, a meeting of the staff was held in the Gloucester District Manager's Office, to bid farewell to Mr. W. J. Norman, who, for health reasons, had recently retired.

Mr. Norman entered the service of the National Telephone Company at Gloucester in January 1901. In November, 1905, he was promoted to the Chief Clerkship in the District Manager's Office, which position he held at the time of his retirement.

Mr. John H. Storrie, the District Manager, presided, and before presenting to Mr. Norman, on behalf of the staff, a silver-plated tea service, expressed the hope that the relief from official duties would result in complete restoration of Mr. Norman's health.

The good wishes of the staff of all sections were expressed by Mr. Brodie Contract Manager, Mr. Barker, Traffic Superintendent, Mr. White, Accounts Section, and Miss Mathews, Fees Section. A letter expressing the good wishes of the Gloucester Operating Staff was also received from Miss Harrhy, Assistant Supervisor in charge of the Exchange.

Mr. Norman returned thanks for the gift and expressions of good will and referred feelingly to the sorrow which he experienced at the severance of official links with the members of the staff with whom he had worked so long and so happily. He also spoke of the pleasant relationships which had always existed between himself and the staffs of all sections.

OBITUARY.

IT is our painful duty to record the death of Mr. W. H. Meaking, Staff Officer, District Manager's Office, Birmingham.

Mr. Meaking passed away unexpectedly early in the morning of May 24. He had not been well for a few weeks, but apparently felt better and intended to return to the office the following Monday.

Mr. Meaking joined the service of the National Telephone Company in 1894 as a clerk in the Birmingham Office. He was Chief Clerk at Chester, Scotland West, and Nottingham, before returning to Birmingham in May 1926.

The interment was at Solihull on May 27 and was attended by the Assistant Postmaster and other representatives of the Postmaster-Surveyor's Staff, together with representatives of the Accounts, Contract and Traffic Staff of the District Manager's Office.

Mr. Meaking was a quiet, unassuming, and just officer, and he will be greatly missed by the staff.

To his wife and family we extend our sincere and deepest sympathy.

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A BRIEF CHRONOLOGY FOR STUDENTS OF TELEGRAPHS, TELEPHONES AND POSTS.

BY HARRY G. SELLARS.

(*Continued from page* 210.)

1900, July ... Buckingham devised an automatic telegraph system including a keyboard perforator in which the punches were worked by electro-magnets.

Storm, of U.S.A., invented a keyboard tape perforator.

Telegraph money order service started with Italy and Sweden.

1900, Dec. 4 ... Order for manufacture of Canada-Australia Cable given to Telegraph Construction and Maintenance Company.

1900, Dec. 14 ... Pupin patented in Great Britain arrangements of telephone circuits with inductive resistances and condensers.

1900, Dec. 31 ... Contract for construction of Pacific Cable signed.

1901, Jan. ... Post Office began to experiment with "loading coils."

1901, Feb. ... Five principal Hawaiian Islands connected by wireless telegraphy.

A. F. Collins, of Philadelphia, announced that he had succeeded in transmitting signals without wires or aerials.

Adolf Slaby experimented in wireless telegraphy in Berlin.

Permanent Board of Control for All-British Pacific Cable established. Members: Sir Spencer Walpole (Chairman), G. E. Yorke Glendowe (Treasury), W. Hepworth Mercer (Crown Agent for Colonies), Lord Strathcona and Mount Royal, and Alexander Lang (Canada), the Hon. Henry Copeland and the Hon. Sir Andrew Clarke (New South Wales, Victoria and Queensland), the Hon. W. Pember Reeves (New Zealand).

1901, Mar. 28 ... First municipal telephone exchange commenced service at Glasgow.

1901, Apr. 24 ... Eastern Telegraph Company granted subsidy for twenty years for laying Sierra Leone-Ascension cable.

Atlantic Cable laid for Commercial Cable Company.

Gotthief Angarius Betulander, of Sweden, devised an electro-mechanical telephone switching system.

1901, Aug. ... Murray telegraph system exhibited in London.

British Pacific Cable Bill passed. Cable to be laid and worked on the route Vancouver, Fanning Island, Fiji Islands, Norfolk Island and thence by two cables to Queensland and New Zealand, respectively. £2,000,000 at 3% raised by the Treasury, profits to be divided in proportion to the disbursements of the governments participating.

1901, Aug. 30 ... Surveying of route for British Pacific Cable completed.

1901, Oct. ... Construction of British Pacific Cable commenced.

1901, Nov. 18 ... Postmaster General and the National Telephone Company signed an agreement to prevent unnecessary duplication of plant and wasteful competition in London. The agreement also provided for the purchase of the Company's London system as at Dec. 31, 1911.

1901, Dec. 12 ... Guglielmo Marconi and G. S. Kemp, at St. Johns, Newfoundland, using a kite aerial of 400 ft., heard wireless telegraphic signals transmitted from Poldhu, Cornwall.

National Telephone Company opened a common battery exchange at Kensington.

Otto Steiger, of Germany, patented a means of bringing a telegraph receiver typewheel into the position desired.

Telegraph money order service started with Algeria, France and Egypt.

Average annual number of letters passing through the Post Office—2,244,200,000.

Telephone receipts, £397,754.

1902, Jan. 1 ... Postal Stores Department and Stores Department, Telegraphs, amalgamated under the title "Stores Department."

Factories made a separate Department under the first Controller of Factories.

Willoughby Smith engaged with the special construction of the Vancouver-Fanning Island cable which is 3,458 nautical miles long.

1902, Feb. ... Wireless messages transmitted between ships and shore at more than 1,500 miles.

First message transmitted across the Atlantic.

Marconi patented his magnetic detector.

1902, Mar. 1 ... First Post Office London Telephone Exchange opened and named "Central."

British Cable Communications Committee reported.

1902, Mar. 13 ... Laying of British Pacific Cable commenced.

Conference between Colonial Secretary and Premiers of Dominions and Colonies passed a resolution in favour of the Government's reserving the right to expropriate cables at equitable rates, if thought desirable.

1902, Apr. ... First Anglo-Belgian telephone cable laid and communication established between London and Brussels.

Fessenden introduced the heterodyne method of wireless reception and produced the first machine for generating direct high-frequency oscillations for wireless working.

Max Wien and Lepel introduced the "quenched gap" in wireless working

(Tarbottan Armstrong and Axel Orling devised the "Armorl" electro capillary wireless relay.)

Valdemar Poulsen developed William Duddell's arc for producing continuous high frequency wireless waves.

Message-rate telephone subscribers were required to undertake payment of a minimum amount in respect of local calls.

Special main trains established between London and Penzance.

1902, Oct. 31 ... British Pacific Cable completed. Vancouver to Fanning 3,458 nautical miles, Fanning to Fiji 2,043 n.m., Fiji to Norfolk Island 891 n.m., Norfolk Island to New Zealand (Doubtless Bay) 519 n.m., Norfolk Island to Brisbane 835 n.m., total 7,836 nautical miles. Greatest depth experienced 3,400 fathoms (about 3¼ miles) between Vancouver and Fanning. Cable designed specially by Willoughby Smith. Prominent promoters: Sir Julius Vogel, Sir Sandford Fleming, Alexander Siemens, Sir Charles Tupper, Sir John Macdonald, Sir Mackenzie Bowell, Lord Strathcona, J. Henniker Heaton, the Hon. Harold Finch-Hatton, Sir William Mulock, W. Pember Reeves, Sir Horace Tozer, and Charles Bright.

1902, Dec. 4 ... All-British communication between Great Britain and Australia advocated by Charles Bright at a meeting over which Lord Brassey presided.

In an address to London Chamber of Commerce, Charles Bright advocated creation of "urgent" and "non-urgent" rates for telegrams.

1902, Dec. 8 ... Canada-Australia cable opened for traffic.

Post Office experimented with motor vehicles for postmen.

1902, Dec. 14 ... Pupin patented improvements of the arrangements registered in 1900 and provided for the use of twin loading coils.

Murray telegraph system installed between London and Edinburgh.

Profit on Post Office Savings Bank during last three years, £65,451.

1903, Jan. ... Donald Murray devised the "Autoplex" multiplex telegraph system with duplex balance, phonic wheel driven distributors, "idle signal" to maintain synchronism, typewriter keyboard perforators, automatic transmitters, and page printing. He applied the phonic wheel drive to the Baudot receiver.

Pierre Picard, of France, introduced an electrical method of overcoming capacity difficulties in submarine cables when used for Hughes working. He also modified the "star wheel" mechanism in the Baudot distributor. Picard introduced speed correction from working signals on the Paris-Marseilles-Algiers Baudot installations.

1903, Mar. 28 ... Jean Maurice Emile Baudot died.

Six minutes allowed for each three-minute telephone trunk call between 8 p.m. and 6 a.m.

W. von Bolton invented the tantalum electric lamp.

E. F. W. Alexanderson, of U.S.A., designed a high-frequency alternator for generating continuous electric waves, and devised a subdivided aerial system for wireless transmission.

(*To be continued.*)

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THE

Telegraph and Telephone Journal.

VOL. XVI. SEPTEMBER, 1930. No. 186.

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Subscription: To the public, 5s. 0d. per annum, including postage. To the Staff, 3s., including free delivery to any Post, Telegraph, or Telephone Office. Single Copies: To the Public, 4d. each, or post free 5d. To the Staff, 3d. each. Orders should be sent to the Managing Editor, TELEGRAPH AND TELEPHONE JOURNAL, *G.P.O. North, London, E.C.*1.

All correspondence relating to advertisements should be addressed to MESSRS. SELLS, LTD., 168, *Fleet Street, London, E.C.*4.

TELEGRAPH AND TELEPHONE MEN AND WOMEN.

LXXVIII.

CAPT. B. S. COHEN.

CAPTAIN BERTRAM SIDNEY COHEN, the present director of communications research at the Post Office Research Station at Dollis Hill, has taken a leading part in practically every development that has taken place in telephony and allied practice for the past thirty years.

Educated at the City of London School and at Finsbury Technical College under Sylvanus P. Thompson, Capt. Cohen joined the National Telephone Company in 1896, after a brief spell with a heavy electrical engineering firm. Prior to the Transfer he was in charge of the Company's Laboratories and earlier was associated at H.Q. with the installation of the first C.B. exchange in this country at Bristol, and while in the Investigation Department he worked out the details for the first iron-core coil-loaded line, between Croydon and London. During the war he was engaged in the development of communications between aeroplanes, airships and balloons and the land, and invented a very useful form of throat transmitter for this purpose.

Capt. Cohen has been awarded the Fahie Premium by the Institution of Electrical Engineers three times, in 1907 in collaboration with the late G. M. Shepherd, in 1926 associated with Messrs. A. J. Aldridge and W. West, and in 1927. He is a British representative on the Comite Consultatif International and is chairman of the Fourth Commission. In spite of his studies, or rather to assist him in carrying on, Capt. Cohen takes every opportunity of open air life, swimming, and motoring, and is never happier than when touring and camping in the wide open spaces.

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The Telegraph and Telephone Journal.

PUBLISHED MONTHLY IN THE INTERESTS OF THE TELEGRAPH AND TELEPHONE SERVICE, UNDER THE PATRONAGE OF THE POSTMASTER-GENERAL.

Editing and Organising Committee - - - Lieut.-Col. A. A. JAYNE. J. STUART JONES. W. D. SHARP. W. H. U. NAPIER. J. W. WISSENDEN.

Managing Editor - - W. H. GUNSTON.

NOTICES.

As the object of the JOURNAL is the interchange of information on all subjects affecting the Telegraph and Telephone Service, the Managing Editor will be glad to consider contributions, and all communications together with photographs, diagrams, or other illustrations, should be addressed to him at the G.P.O. North, London, E.C.1. The Managing Editor will not be responsible for any manuscripts which he finds himself unable to use, but he will take the utmost care to return such manuscripts as promptly as possible. Photographs illustrating accepted articles will be returned if desired.

VOL. XVI. SEPTEMBER, 1930. No. 186.

PROGRESS OF THE TELEPHONE IN EUROPE.

WE were able to record in our January issue that the increase in the number of telephones in Europe during 1928 was 644,000, or 7.5% on the previous year, much the largest yet recorded. The statistics for 1929 which have so far come to hand indicate that this figure will be improved on. Although the returns for five or six countries are not yet to hand, it is found that the increase of 1929 over 1928 is already 705,000, which, with a conservative estimate for the six outstanding systems, should yield a total increase of 750,000 for the year, or 8.1% on 1928. This increase will, in fact, bring the total number of telephones in Europe very nearly up to ten millions. This total, perhaps, does not appear too brilliant when compared with the North American total of over 20 millions, but it may be noted that, whilst America is increasing at the rate of about 4½% per annum, Europe is increasing at the rate of 8%. It is gratifying to note that Europe's total has doubled in 10 years, whilst that of North America has increased by almost exactly one half (14 to 21 million) in the same period.

The principal contributors to Europe's record increase are Germany with over 230,000 stations, Great Britain with 127,000, France with 90,000, Italy with about 50,000, Russia and Spain each with about 36,000, Holland with nearly 27,000, and Sweden and Switzerland with over 24 and 22 thousand respectively.

We may be permitted to hope that the 1929 rate of increase will be maintained in Europe in 1930. It is at least conceivable that, while the better-developed countries may in some cases fail to attain the figures of 1929 owing to the incidence of trade conditions and other economic influences, the many other countries with a vast field for telephone development may counterbalance their shortcomings and keep the average increase at 8% for some years to come.

HIC ET UBIQUE.

IN the absence of several members of the Editing Committee on annual leave, it has not been practicable to judge the designs sent in for a cover for the *Journal* in response to the invitation in the May issue, and we are, therefore, not yet in a position to announce the name of the winner of the competition.

We have received the annual report of the Posts and Telegraphs Department of the Federated Malay States for 1929. The total number of telephones has increased by 541 to 5,075 within the year, and there are in addition 2,403 extension lines and bell circuits. The number of telegrams dealt with was 438,249 outward and 463,492 inward—an increase of 2.2 and 2% over 1928.

It is stated, says *The Electrical Review*, that the Japanese Ministry contemplates the formation of a semi-official telephone corporation, with a capital equivalent to 80 million pounds sterling, to handle the non-operating side of the telephone system. The suggestion is that the Japanese Government shall contribute half the required amount in property, the other moiety, in money, being provided by private sources.

We learn from the same source that the South African Post and Telegraph Authorities have made a contract for £750,000 with Siemens Bros. and the Automatic Telephone Manufacturing Co., Ltd., for the installation of automatic telephones throughout the Union. The contract provides for the installation of equipment in all the principal centres of the Union. It is spread over five years, and in dividing the orders for the plant between the two firms South Africa obtained advantageous financial terms. The Johannesburg and Cape Town installations will be the first to be undertaken. The Johannesburg equipment is to be delivered by March, 1931, and the construction work and change-over are to be completed by the following October. There will be a central exchange in McLaren Street with 6,500 lines, one at Hillbrow with 3,500 lines, and provision is to be made for four satellite exchanges. At Germiston the system is to be introduced by 1932, and it will be extended gradually from Springs to Randfontein. In the Cape Peninsula the first conversion is to be made by 1933, when the three centres of Cape Town, Central Woodstock, and Seapoint will command 15,900 lines. Others will follow, Rondebosch and Claremont in 1934, Muizenberg in 1935, and Wynberg in 1936. By the end of 1937 the automatic system will be in operation throughout the peninsula. Port Elizabeth already has an automatic exchange, and two satellites are to be opened, the contract specifying March, 1931, for delivery of the plant; by 1936 it is expected that a further exchange will be necessary. The East London exchange is to be completed within eighteen months, with 2,500 lines. Durban municipality owns the telephone undertaking there, but the Minister of Posts and Telegraphs is negotiating with the object of taking it over.

His Excellency Mom Rajawongse Chua Snidvongse is on a mission of investigation into the condition of automatic working.

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in view of the conversion of the Bangkok and other exchanges in his native country. Already Siam boasts a comparatively modern manual telephone system, but in common with other progressive countries is desirous of bringing this thoroughly into line with the latest accepted automatic practice as standardised in Great Britain and elsewhere.

PRINCE RAJAWONGSE CHUA SNIDVONGSE.

In addition to a comprehensive survey of the Strowger Works of Automatic Telephone Manufacturing Company, Ltd., and the Prescot and Helsby Works of British Insulated Cables Ltd., His Excellency inspected the Mersey Tunnel and visited the Southport Automatic Telephone Exchange and the office of the Engineer-in-Chief of the Post Office in London, where every facility for studying the telephone system was placed at his disposal.

The Shanghai Mutual Telephone Company has been acquired by the International Telephone and Telegraph Corporation. The Shanghai Company operates in both the International and French Settlements with a foreign population of about 50,000 and about 1,100,000 natives. On May 31 of this year it was serving 36,219 telephones. The Company connects with the Chinese Government Exchange operating in the native section of Shanghai, and it also connects with lines of the Chinese Government Telephone Administration or long-distance service to points in the Yangtsze Valley as far as Nanking, a distance of about 165 miles.

The following cutting is from a Church newspaper (Church of Scotland, Sandyford Road, Newcastle-on-Tyne). It seems to indicate a fresh field of activity for the telephone :—

THE TELEPHONE.

It is used for business.
It is used for society, for pleasure.
It can be used to help your Church along.
Your Minister's 'phone number is Jesmond 1409.

Ring him up—to tell him of people you think he should visit, the sick, the aged, the neglected, those drifting from the Church, those Scots lads and lassies attending no Church.

But do your own bit as well; invite them along and welcome them when they come; make the lonely and friendless feel at home in the Church.

Civil servants will be interested to learn that Mr. Samuel McKechnie, the editor of the *Civil Service Arts Magazine*, has written a book, which will be published next month, entitled "The Romance of the Civil Service."

This interesting volume deals with all the main activities of this vast organisation, and Mr. Philip Snowden has provided a foreword.

PEREGRINATIONS THROUGH THE BROADCASTING WORLD.

BY J. J. T.

(*Continued from page* 225.)

SINCE the publication of last month's issue of the *T. & T. Journal*, the matter of Battery Eliminators and the Vendors—hereinafter called the undertakers (*sic*)—of electric current has been very seriously discussed in the electrical press. *The Electrical Review*, in a leading article early last month, declared that "the legal position is somewhat obscure." This position, however, is dealt with at some considerable length in the pages of the same publication by Mr. J. W. Thomas, L.L.B., B.Sc., A.M.I.E.E. (Barrister-at-Law).

Mr. Thomas declares that "many electricity undertakers are at the present time engaged in the laborious process of changing over their supply from d.c. to a.c. or altering their frequency in accordance with the requirements of the Central Electricity Board. . . . Not the least difficult of their problems is that concerned with "the respective rights and obligations of consumers and undertakers." Search has been studiously made in the electricity legislation from 1882 to 1926, but, "unfortunately," says Mr. Thomas, "without discovering anything very explicit on the point as to whether the consumer has any rights and the undertaker any obligations in regard to the replacement of apparatus or plant when a change of system is effected, either on the initiative of the undertaking itself or on the instructions of the Electricity Commissioners of the Central Board." It also appears doubtful whether the framers of the various Electricity Acts even considered the possibility of a consumer's apparatus being rendered useless by a change of system, and again to quote Mr. Thomas, it would appear that "the Legislature made no definite provision for safeguarding the interests of the consumer in the event of a change of system taking place." It is further stated that certain undertakers have made it a practice to refuse approval to connexion with their mains of such apparatus as d.c. battery eliminators on the grounds that they "are regarded as a potential source of danger." On the other hand, there does not appear to be any record of a single test in the Courts of Law as to the legality of this attitude of such undertakers. Again, other authorities hold that undertakers should not be called upon to accept liability for apparatus which had been connected without the knowledge and approval of such undertakers. This, however, is apparently met by Section 18 of an Act of 1882, which precludes an undertaker from prescribing any special form "of lamp or burner to be used by the consumer." There are other "pros" and an equal number of "cons," but readers will no doubt have had sufficient by this time to convince them of the "much ado" which that lowest of the low current consumers, the battery eliminators, has brought about.

Up to the moment of writing nothing has so far been heard of any decision of the South-East Lancashire undertakings conference, but *The Wireless and Gramophone Trader* states that the Corporation of Nottingham have given an assurance that, in the event of the municipal electricity distribution system being changed over from d.c. to a.c., its Electricity Department will assume the responsibility of making good any wireless apparatus that may be affected.

It is by no means certain that the example of Nottingham will be generally followed. It has to be remembered that the very small amount of current consumed by an eliminator could scarcely prove remunerative if, as is sure to be the case, in certain centres the number of eliminators in use proves to be in any measure considerable.

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Developments and Otherwise in Broadcasting.—The figures of our own Patent Office show the increasing number of brains which have been concentrating on radio matters in general, *vide* last Report of the Comptroller-General of Patents, who, among other features, states that "Compared with 1927 and 1928 there has been a marked increase in applications relating to the construction of thermionic valves for radio, &c., &c., and an increase of nearly 50% in applications concerned with circuits for wireless signalling, and a similar increase in connexion with television and copying telegraphs."

It, however, behoves the onlooker—eager as he or she may be like the old Athenian to see or hear some new thing—to curb the natural excitement of an enthusiast upon the reading of each new "discovery." There are many well-meaning inventors; there are many more none too well informed but wonderfully imaginative, and equally well-meaning pressmen! Dr. Sydney N. Baruch, owner of broadcasting station WBNY, New York City, has recently announced the perfection of a system of broadcasting which he claims will permit the assignment of 200 (two hundred) channels in the space now occupied by one. The system, says the *T. & T. Age*, is only intended for short-wave relaying purposes and "is based upon ordinary alternating current practice known to every electrical power and lighting engineer." "Two waves of the same frequency are utilized," says the doctor. "Nothing is placed *on* the wave, as in ordinary broadcasting, to change its shape or form; intelligence is carried by the shifting of one wave with respect to the other, such as engineers call *lag* and *lead*. This determines the amount of energy intercepted at the receiving device. Normal modulation is produced by a 45-degree phase shift in the two carrier waves of the same frequency." The doctor affirms that the speed of transmission is tremendous. Writing as an amateur of the amateurs and a mere child in these matters, the arrangement seems to read well logically, and if the system were capable of increasing broadcasting channels even by 25% of what is claimed for it, and is only suitable for short-wave working, there would undoubtedly be room for such an invention, more especially in a country with so high a number of potential listeners and immense distances to cover.

It is surely only in a country of wide spaces that the following newly-found use of broadcasting would be welcome and possible. It is seriously recorded that Mr. and Mrs. Thornton, at their poultry farm at Gunning River, near Barnegat, N.J., discovered that when Mr. Thornton entered the hen-houses cheerily whistling and singing, "the fowls showed increased animation and cheer." Mr. Thornton having no near neighbours to consider, argued with himself, and it is presumed in consultation with Mrs. Thornton, decided that he would try the effect of music from his radio set. The loudspeaker was then transferred to the hen-houses, and at 3 a.m. the set was tuned in. After a reasonable time statistics showed that the egg-production of Gunning River poultry farm had increased by no less than 15%! There is one difficulty, however, which so far has not yet been overcome. It is not always possible to obtain music at 3 a.m. Of course, a lecture on the neolithic age would scarcely produce a stimulating effect upon the most industrious bird, and with regret we must leave the proprietors of this notable farm to solve what is undoubtedly their own special broadcasting problem. We need not cross the Atlantic to obtain examples of curious uses of broadcasting. The London *Times* recently reported that a farmer in the Hartz Mountains has found that a wireless loudspeaker is a most effective substitute for a scarecrow. On the other hand, the *Electrician* quotes a report from France to the effect that daily prayers have been offered in all the churches on Mont St. Michel for an entire week, as part of an intensive local campaign against the "perils of the radio," the clergy in that district apparently considering wireless as an organ of anti-religious propaganda. In view of the elaborate radio arrangements now very near to their termination in the Vatican, it seems improbable that such a view is countenanced in high quarters.

(*To be continued.*)

ROTATION *v.* SPECIALISATION.

IN the province of Service politics, enough almost has been said and written on the question of rotation of duties to exhaust discussion, but at this time, when many traditions and ideals are being sacrificed at the altar of rationalisation, a further word on the subject may be opportune. While little opposition has been offered to rotation in principle, it has been manifest that in the main the question has been viewed only in an academic light and that there has been a certain reluctance to any general application of the principle; having regard to the latter fact, it is feared that rotation, like other projects which may have cultural or educational value but show little monetary profit, is in danger of being relegated to the limbo of things forgotten.

The main contention of the opponents of rotation is that it increases costs and impairs efficiency, but even assuming that to be correct, it is not considered that these reasons alone form an insuperable barrier to rotation, for now that we have reached a stage in the industrial world when employers are accepting a definite responsibility for the welfare and comfort of their employees, surely it is not too much to expect that some risks might be taken to give employees a broader field for expression and relieve some of the prosaicism of their daily tasks. After all, work constitutes a great part of one's life, and to make life tolerable a measure of enjoyment must be derived from that work, therefore let us pause and consider whether we can afford lightly to dispense with a means by which we might enhance that enjoyment.

The rotation controversy has been mainly centred on the relative values of the specialist and the operative with what is loosely termed general knowledge. It may be verging on sacrilege to criticise the specialist in an age which bows to specialisation, but nevertheless, there are indications that specialisation has not proved to be the panacea it was heralded as some years ago, and there is a doubt whether the benefits derived from its adoption fully compensated for the irritations set up in other directions.

There is abundant evidence that the result of restricting the workers' efforts to a narrow range of routine duties for lengthy periods is detrimental to the operative, and even to the interest of the employer, and perhaps we have now reached a stage when we might with advantage adjust our perspective in relation to specialisation.

The effect of specialisation on operatives varies according to the temperament of the individual, but a very common result is that initiative is destroyed and a state of inertia set up until ultimately the man is reduced to a mere automaton existing very similarly to the proverbial goose who was afraid to venture outside the chalk circle. Then again, there is the type who, on finding his activities restricted to narrow limits, seeks elsewhere for scope to satisfy that inner urge to bigger things, and often these new interests, adopted as secondary, become primary interests, with the result that the attention given to his employer's demands is more or less perfunctory.

Even confining our deductions from these two types to the narrow limits of the employer's profit and loss account, surely it cannot be upheld that the creation of such types is conducive to success, for while the producing capacity of the individuals in question may approximate to the average, it is evident that they are not giving that little bit extra which is so essential in any concern to achieve 100% success; but when we turn to the broader field and visualise the first type as a citizen, with the responsibilities pertaining thereto, the prospect is a disturbing one, and anyone with a regard for the sanctity of citizenship and culture must view with apprehension any system which tends to deaden thought.

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In the space available one can merely touch the fringe of this subject, but before concluding it might be useful to direct our attention to the case of a man who is anticipating advancement at an early date. In this connexion, the question which immediately arises is "How does the specialist stand with regard to promotion?" It would seem that when this stage is reached the specialist is labouring under a severe handicap as against the individual who has acquired a knowledge of his business in its various branches, and that the latter must prove a more valuable man in a supervisory capacity. From that it is not a great step to say that the man who has reaped the benefit of rotation is the more useful man to a business in every respect, and when it is considered that this individual can be utilised for substitution and in cases of emergency, and thereby minimising dislocation, the suggestion that some compensation—perhaps in the way of an allowance—might be granted to him in respect of his versatility and greater knowledge, is not so bizarre as would appear at first sight, and who knows but it may be found in the future to be advantageous to fix an officer's remuneration commensurately with his experience and knowledge.

Should this short sketch on a big subject happen to come to the notice of some who have given little thought to the problem of rotation and prove of seminal value, in pursuing the question further they would do well to bear in mind these words of Bailey's:

> "The firefly only shines when on the wing; so it is with the mind, when once we rest we darken."

E. J. WRIGHT.

THE BUTCHER MYSTERY.

BY F. J. LANE.

Do not think that this is a strange tale of cries in the night and sickening thuds such as Mr. Edgar Wallace might tell, nor yet a harrowing story of the stockyards of Chicago where, according to Mr. Upton Sinclair, men were either turned into animals or into lard. (There was usually some doubt at the outset which would happen first!) Really, the title might have been one of those rhetorical questions like "Why do girls leave home?" or "What is wrong with the Selection Committee?" but for the fact that the writers of such articles do not really want to know at all; they earn their living by answering the question on their readers' behalf, whereas I really should like to know "Why butchers are always on the telephone?" (I do not, needless to say, earn *my* living by asking these questions.)

First, I hasten to say that personally I have no objection to this habit of butchers—in fact I've grown to like the peculiarity and do my best to encourage it—but that does not alter the fact that statistics show (or at any rate might do!) that the phoneless butcher is decidedly more rare than the grocer or baker who foolishly plods through life without the goad of the telephone bell ("bell," you'll observe, not "bill").

If we pass down the High Street we shall, being observant, see the magnificent poultry, meat, fish, game dealer displaying a selection of his wares on a marble expanse glistening with a gentle stream of water from glittering blocks of ice. In case we are still unconvinced of the proprietor's solicitude for his customers, a suspended notice above bears the inscription "Meat stored in the refrigerator." If we stand gazing long enough at this "close up" of Greenland's icy mountains, we shall no doubt hear without experiencing a thrill of astonishment the tinkle (or rasping burr) of the telephone bell—that is what we expect. A man, who obviously deals exclusively with the upper ten thousand is "on the phone"—not much mystery about that.

If, having nothing better to do, we stroll through the less salubrious thoroughfares our footsteps will, in the fulness of time, bring us to the little butcher round the corner whose window display is, to put it mildly, disappointing after the aristocrat of the High Street. The marble slab is replaced by the humbler wooden one on which, lying prone, are two pieces of steak showing distinct signs of what wireless fans would call "surface deterioration." On them three or four bluebottles about the size of swallows are lunching with that self-conscious haste of the species, whilst half a dozen others are jockeying for a "place" in a race to a fragment of semi-decomposed sausage lying in the corner of the shop. A feeble endeavour to keep "up sides" with the marble-and-ice-king in the High Street provides the motive for a dog-eared card announcing that meat is kept in the cold room. (Presumably the two pieces of steak aforementioned are on show in order to dispel the allusion that one has haphazard entered a bicycle shop!) Lifting our eyes from the rather depressing spectacle, we cannot fail to register some degree of surprise at seeing the familiar countenance of telephone type No. 2 gazing austerely over the restaurant-cum-aerodrome before him. We feel that the telephone must surely be everywhere and that the contract staff deal only with removals and requests for heliotrope coloured telephones.

This, however, is not the case, as a tour of other shops will show. Very likely it will be found that the smartly appointed provision shop has no more acquaintance with the telephone than a prison cell. When I have had occasion to draw the proprietor's attention to this curious omission from his commercial equipment, as often as not, the reply is "If I had the telephone I should be always rung up for a quarter of a pound of fat bacon and a penny block of salt." Apart from my oft-repeated contention that the theory that telephone subscribers as a class subsist entirely on scraps of fat dipped in salt, will not hold water, why is it that the butcher does not live in terror of persistent requests for two pennyworths of lights for the cat? It is the merest futility to argue that subscribers do not possess cats, for I myself have met one with two extensions and three cats, and by a little impartially dispensed stroking have had them purring like a trio of Austin Sevens—the cats I mean, not the extensions. The half-hearted suggestion then put forward that subscribers' cats do not care for lights is simply fencing—there are definitely no such cats.

Of course, there are grocers who boldly take the chance of being inundated with urgent appeals for penny balls of string, and a few empty cardboard boxes; but it cannot be said that as a class they are anywhere near so telephonically inclined as butchers. A contract officer setting out with the hope of getting a new rural exchange (a form of sport, by the way, which, owing to the prodigious efforts of the Contract Branch is becoming as extinct as "baiting the dodo") runs his expert eye over the hamlet and instinctively enters the butcher amongst the "probables," whilst he feels that the grocer can only be fairly classed with the "possibles."

It is not asserted that butchers are alone in their desire to be in touch with invisible friends or foes. Motor car people are usually good customers to the telephone service; but in their case reasons for their affection for telephones are more obvious. They are men of a hurrying world and have keen ten-thousand-a-year faces which somehow look incomplete unless one ear is stopped up with a telephone receiver. The motor agents can be to some extent understood at a glance: but why butchers?

I am informed upon unimpeachable authority (my wife, to wit) that if there is one thing one should select in person it is meat. This at first sight seems to deepen the mystery, but further details may form the basis of a solution. It appears that if you do not observe the elementary precaution of appearing in person and order two pounds of beefsteak by "indirect" methods, the butcher is apt to give himself the benefit of the doubt in estimating the amount to be cut off the animal, and turns up with a smile, and about four and a half pounds of steak.

I am not going to offend our good customers by so much as suggesting that this is the reason for the general telephonification

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of the meat distributing trade. Far be it from me to discourage this butcher: after all, if he does turn up with two-thirds of the month's export of the Argentine Republic, in response to a telephoned request for two pounds, I suppose with a little light chaff it might be possible to induce him to take some back.

A better explanation of the great mystery might be found in the words of a modern statesman whose name I have forgotten, when speaking on some projected Bill, the object of which I cannot remember, said we (I can only assume that I was included) were apt to "think parochially." I don't know whether this way of putting it is original or not; but it is obviously very true. It is very possible, then, that whilst "my" butchers are sound keen business men, butchers taken by and large are no more telephone addicts than bakers or candlestickmakers would be, if someone hadn't provided a better place for pianists' cigarette ends than two projections of ornate design on the front panel of the instrument.

[*Author's Note.*—To save further correspondence, I may say that since writing "The Butcher Mystery" I have been informed that Mr. Edgar Wallace seldom if ever uses the term "sickening thud." It appears that his characters, possibly owing to some physical peculiarity, fall with dull thuds or with just thuds (unclassified).

The reference in the same paragraph to men being turned into either animals or lard is claimed from "The Jungle," by Upton Sinclair. According to that work the appalling cruelty of the Chicago meat packers of the time must have changed a man into something inhuman unless (as is also recorded) he first falls into a lard vat. In this event, owing to the fact that the contents are boiling furiously, his rescue is considered by his fellow slaves impracticable and by his employers unnecessary.]

REVIEW.

"A Study of the Induction Motor." By F. T. Chapman, D.Sc. (Eng.), Lond., M.I.E.E., A.M.I.C.E. 289 pp. Published by Messrs. Chapman & Hall. Price 21s.

This book deals very exhaustively with the subject and should appeal more especially to designers and to senior students interested in the more advanced theory of the induction motor. To keep the book within convenient limits only machines without commutators are dealt with.

In developing the theory special attention is given to the harmonic analysis of the air gap field, and it is shown that normally only the fundamental field is of any practical importance in transferring power from the stator to the rotor. On this basis a new definition of the coefficients of the windings is derived and methods for the calculation of these coefficients are developed. To obtain the fundamental equations and circle diagrams it is first assumed that the magnetic circuit of the motor is replaced by a stator and rotor made from material of infinite permeability with smooth unbroken surfaces bounding the air gap, the length of which is corrected to take into account approximately the effect of the slots and saturation of the iron. In later chapters the secondary effects due to the slots, &c., are investigated.

Separate chapters are devoted to single phase and auto-synchronous motors, the squirrel cage rotor is dealt with somewhat fully, and a theory of double-cage winding given. Chapters are also included on the mechanical construction of the motor and windings employed, while multi-speed induction motors, motors in cascade and the Hunt motors are also dealt with.

There are also included practical calculations in which an example is given to show the applications of the methods for dealing with the leakage, magnetising current, and the iron losses which have been dealt with theoretically earlier in the book.

TELEGRAPHIC MEMORABILIA.

As I write, it is whispered in my ear that the Managing Editor is on leave. This affords me the only opportunity I am likely to have for many moons to scribble a few words concerning that patient functionary, hoping that his *locum* will slip my manuscript into the hands of the printers ere W. H. G. returns. The fact that the writer has just read the latter's paper on "The Telephonist and the Press," which appeared in the *T. & T. Journal* of last month, has led him thus to go behind the back of a colleague! What Mr. Gunston does not know concerning the history of the Telephone Service is not worth knowing, and what at times appears the most aggravating feature concerning the situation is, that Mr. Gunston may not always be *permitted* to give the many ill-informed critics a Roland for their Oliver! There is, however, a suavity about Mr. Gunston's retorts and replies which disarms, while the wounds are always of the gentle rapier kind. It is well, however, that the Telephone Service has so competent a defender, and the Telephonists so gallant a knight, as was disclosed in the paper above mentioned. As one after another the fables and illusions of many of the critics are confronted, and that with courtly grace by chapter and verse—sometimes with former words out of their own mouths—one remembers the jingle of that old poem of "The Fakenham Ghost," which, after disclosing the real "ghost" of the tale, winds up with the suggestion that "Perhaps some other goblin tales maybe were just as true."

Personal.—To have a memorial erected in one's lifetime is a rare event indeed, and so far as the Telegraph world is concerned, that initiated by the parishioners of Brockham Green, Surrey, to Mr. and Mrs. Kempe, who have resided in that parish for over 45 years, is probably unique. Mr. Kempe joined the Engineering Branch of the Post Office in 1871—when many even on the present retired list had only just commenced school-life—and the memorial mentioned is timed for the present year on account of the happy fact that Mr. and Mrs. Kempe have just celebrated their golden wedding. Who has not been helped by Kempe's "Handbook of Electrical Testing"? Is it not over thirty years since "Kempe's Engineering Year Book" first appeared? Was not Mr. Kempe connected with the editing of *The Electrical Review* in its very early days, and is probably still loth to part with this early love? Of Mr. Kempe's labours in the Government service it is not now necessary to write. They are already recorded and will ever be associated with the history of the British Post Office. All that one would wish now to do is to join with the Brockham parishioners in heartiest congratulations and to express the sincere hope that Mr. and Mrs. Kempe may spend yet many more years of conjugal happiness. That hard work and diligent study do not necessarily act against longevity is evident when one looks back on the past activities of Mr. Harry Robert Kempe, M.Inst.C.E., M.I.Mech.E., M.I.E.E. The memorial is to take the form of a set of oak choir stalls and fittings in Christ Church, Brockham Green, and a suitable tablet.

Promotion.—Quite a number of retired officers of the Telegraphs who at one time or another have come into contact with Mr. G. T. Archibald on official matters, would desire to present their sincere congratulations to that gentleman upon his promotion to the important and highly responsible post of Deputy-Controller of the Central Telegraph Office, London. It would by no means prove an unlikely happening if Mr. Archibald were to see the all-but complete mechanisation of commercial telegraphy in this country within the next decade—let us say by the year of Mr. Archibald's retirement!

Congratulations also to Mr. A. W. S. Bird, Asst. Superintendent, Cable Room, upon his retirement from the Cable Room on reaching the age-limit and the best of wishes to those others mentioned in the C.T.O. notes. This need not mean "good-bye," but only "au revoir," as all hope for opportunities of meeting these old colleagues at one or other of the office functions.

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To the greatly respected Mr. A. Upson, Overseer of the same department, the sincerest commiseration at the news of his compulsory retirement at a time, too, when his many friends considered that there were excellent possibilities for so worthy a colleague. It was not to be. An illness which is likely to severely curtail his activities intervened, and the best and united wish now is that our friend will be able to find at a suitable price that suitable country retreat, where the minimum amount of stress and strain may well assist to lengthen the days of one who is even now meeting the situation with a courageous optimism.

Companies.—Anyone interested in the Telegraphs in this country, especially during the present slumpy conditions, would naturally feel inclined to jump at the headline, "A Year of Placid Prosperity," when the phrase was definitely connected with the satisfactory annual report and balance sheet of a fifty-years-old company, to wit, W. T. Henley's Telegraph Works Co., Ltd. Eagerly reading through the chairman's statement, and expecting to see some definite signs of increased telegraph business on the horizon, I read no farther than "Increased sales of tennis and golf balls by the company"! O these by-products! Then I turned to the report of the first annual meeting of Cables & Wireless, Ltd., which took place on July 15—three days prior to the Henley meeting. I should have maintained correct chronological sequence and saved myself a shock, for the chairman, Mr. J. C. Denison-Pender, there disclosed, among other things, and according to *The Electrical Review*, that "the results of the communication business were disappointing. They had had the misfortune to run up against an unprecedented period of trade depression just at the moment when they were reorganising these world-wide telegraphic services. There was an intimate relationship between trade and telegraphic traffic, and 80% of their telegraphic revenue was in respect of commercial traffic. It was certain that with a revival of trade there would be a revival in telegraph revenues." The chairman added, "Cables played an important part in world communications. Even to-day the great bulk of the company's revenue was derived from cable traffic." Mr. Denison-Pender quoted, as an instance of the present financial situation, the case of a certain Stock Exchange firm which only a few months ago was regularly handing in one hundred telegrams per day. Now a paltry half-dozen was the quota!

Imperial & International Communications, Ltd.—The estimated traffic receipts for the first half of the current year were £3,108,149, a decrease of £300,426, or 9.7%, as compared with the receipts for the corresponding period of last year.

"*Birds' Nests on Telegraph Wires.*"—The interesting letter and photograph from Mr. B. Wienick, in the August issue of the *T. & T. Journal*, reminds the writer of an incident which occurred in the Madras distirct in 1906 during the installing of the Baudot system between that city, Calcutta, Bombay, &c. Mr. E. H. Dykes, of the E.-in-C.'s Dept., and myself, had been much plagued with intermittent trouble which we maintained was due to the condition of the line between Madras and Calcutta. Each time the line was tested the test officer assured us that insulation was well above standard and steady. This lasted one or two days. The next day was Sunday, and we made it our business to do a little private line inspection on our own account, and strolled along the seashore carefully scanning each pole and its insulators. We had not gone far when Dykes pointed to a bunch of twigs which turned out to be a crow's nest, partly made of broken iron wire scraps which lightly bridged the two bottom wires on the pole. One of these wires we had already identified as the line with which we had been experimenting. Looking farther along the beach we discovered the depot from which our crow friends had obtained the metal portion of their material in the remnants of an old spring mattress which had been thrown up on the shore. The local engineer expressed no surprise as regards the capacity of an Indian crow to utilise such material, but he did say a few unprintable words about the native linesman who swore by all that was holy that the fault had been removed two days previous. Anyway, the next day working was smoothness itself and continued so for many more next days.

In the Mashobra hills monkeys were also somewhat of a pest, especially as they are looked upon as sacred, and though they make a gymnasium of overhead lines, must not be unduly interfered with!

A very interesting series of articles on Television has appeared in recent issues of the *Observer* by Captain Ernest H. Robinson, G-5YM, and to those who are sufficiently interested to know something of the history, and of the why and how of Television, without becoming too deeply entangled in technical terms, a perusal of these particular articles, which commenced on July 28, is confidently recommended. Captain Robinson recalls that Graham Bell, having finished with the invention of the telephone, himself deposited with the Franklin Institute, in the U.S.A., a description of an apparatus for seeing by electricity. The apparatus was very crude, and gave just the hint at possibilities. He fixes 1884 when Nipkow invented the scanning disc as the first step in real progress.

Countries.—AUSTRALIA.—*The Electrical Review* recently stated, that in some branches of the electrical industry in Australia, production is so well advanced that the Post Office claims that now the only imported materials needed for aerial telephone lines are the small sleeves for jointing the wires and the vulcanised rubber-insulated wire at terminal and intermediate points. In underground construction, also, it is said that a substantial reduction has been made in the use of imported material. Until recently, everything except pipes and conduit to carry the cables was imported; now all the ordinary cable requirements are made locally, and a start has been made with the production of terminal and distributing boxes. According to the London *Daily Telegraph*, Senator Uchida, president of the Wireless Telegraph Co. of Japan, has arrived in Sydney (N.S.W.) with a view to establishing wireless telephone communication with Australia. AUSTRIA.—*Continental broadcasts via telephone.*—The first musical programme relayed by telephone line to British listeners was broadcast from London on Aug. 7. The success was due to the completion of the new cable from Nurnberg via Passak, in Germany, to Linz, and thence to Vienna. It is estimated that there were no less than one thousand miles of circuit used, and when one listened to the real musical beauty which was distributed from the London and Midland Regional transmitters, and heard the Viennese announcer call in turn, Salzburg, Linz, Nurnberg, Stuttgart, Frankfurt, Koeln, Aachen, Liege, Ghent, Ostend, La Panne, Canterbury, London, one could only look back just a few years and then unfeignedly exclaim "What amazing progress in long-distance audition"! BELGIUM.—It is officially stated, in a report from the Commercial Section of the British Embassy in Brussels, that the construction of overhead telegraph lines has been discontinued, telegraph lines now being incorporated in the telephone cables. CANADA.—The number of listeners' licences issued during the first two months of the current fiscal year was more than half the total for the whole of last year, says *World Radio*. Over six hundred free licences to blind people had been granted up to May 31 this year. CHINA.—The *Electrician* states that the Central Government in Nanking has commissioned the Telefunken Co. for Wireless Telegraphy, Ltd., in Berlin, to supply a broadcasting transmitter with about 60 kw. output, similar to the type installed in Oslo by the Telefunken Co. for the Norwegian Telegraph Office. *The Shanghai Boycott.*—Regarding the statement in last issue (see page 216) regarding the threatened boycott of the I. T. & T. Corporation should the latter succeed in purchasing the Shanghai system, and *The Times* statement that the Government will never recognise the validity of any franchise granted to the Corporation by the International and French Concessions, the more recent news states that a Consular reply to this protest of the Nanking Government declares that the sale of the Shanghai telephones to the I. T. and T. Corporation *is* within the competency of the Municipal Council to approve, as the transaction was carried out under the relevant law. DENMARK.—*World Radio* states that 43% of U.S.A. families utilise broadcasting receivers. It is, however, remarkable that our cousins across the Herring Pond are quite easily beaten by one of the smallest European countries, for in Denmark nearly 47% is the figure. FRANCE.—*A New Telegraph Service.*—The French P. T.

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& T. Authorities have now in working order an arrangement by which the telegraph has been made easily available to passengers on many of the fast day trains on the French railways. Telegrams written on the trains are collected by railway servants and forwarded from the nearest station. The cost of such telegrams is paid by means of postage stamps, both forms and stamps being available on the trains. It will also be possible for passengers on the particular group of trains to receive "Urgent" telegrams during the course of the journey. The new service is actually established on the fast trains in each direction between Paris and the following points: Cherbourg, Brest, Bordeaux, Quimper, Toulouse, Portbou (Spanish frontier), Marseilles, Vichy, Geneva, Brussels, Strasbourg, Luxembourg, and Basle, &c., &c.

Secret Wireless Stations.—Towards the end of July the Parisian Wireless Detective Department discovered three secret wireless stations which have been in competition with the State Telegraphs of France. The first clue, says the *Daily Telegraph*, was a message on a short-wave length from an American who asked his correspondent to pass it on to a woman in Paris. This was at Halluin, Nord, and the other two, one in Metz and one in Paris, were discovered by radiogonometric means. In all three cases private telegrams were being transmitted, which otherwise should have been dealt with by the State service. One of the three had been licensed as an experimental transmitting station, but had been worked commercially for some time. The owners of all three sets are being prosecuted for defrauding the French Government. ITALY.—The number of listeners' licences issued in Italy, on June 1 last, showed an increase of over two hundred per cent. as compared with the number issued up to Jan. 1, 1929, says *The Electrical Review*. Up to the time of going to press the inauguration of the Vatican wireless station was one month overdue. The test transmissions will be on wavelengths of 50.26 and 19.84 metres. IRISH FREE STATE.—The somewhat belated telegraph and telephone accounts of the I.F.S. for the year ended Mar. 31, 1929, have only quite recently been published. There were deficits on both services, £147,955 on the former, and £34,719 on the latter. NEW ZEALAND.—From Wellington an American "Trade Commissioner" reports to the *T. & T. Age* that "important developments are about to take place in telegraphic communication within the Dominion by the installation of Teletype Telegraph Printing Machines." The Morkum Teletype is apparently the system which is about to be tried out. This is described as a faster machine than the present "multiplex at present operating between Wellington and Auckland," and a Double Baudot is evidently the multiplex referred to, as the Commissioner adds "Each of the four centres in New Zealand and several of the more important towns are joined by the same kind of automatic telegraphic apparatus, *but the capital cost had prevented their general use.*" In the course of his recent Budget speech, Mr. G. W. Fordes, the Prime Minister of New Zealand, said that during the past fiscal year £657,000 had been spent by the Government on telegraphs and telephones. NORTH AFRICA.—At the sixth North African Conference, held at Algiers a few weeks ago, the following French possessions were represented: Morocco, Tunisia, Algeria, French West Africa, and French Equatorial Africa. The Conference decided that new arrangements shall be made on behalf of N. African stations, in consultation with the French administration, to incorporate them in the frequency band which has been allotted to France in the general European system. The Conference also decided, according to *World Radio*, that the N. African broadcasting authorities should co-operate with the National Meteorological Office in order to find out the most effective means of protection against atmospherics. NORWAY.—An expenditure of £250,000 on new radio equipment, including transmitters, is involved in a reorganisation scheme under consideration. RUSSIA.—The Moscow correspondent of the London *Observer* reports that the Soviet ice-breaker *Sedor*, with an important exploring party on board, had reached Franz Josef Land in the last week of July. Several prominent Arctic experts and professors are on board, including the director of the Krassin expedition which rescued General Nobile in 1928, Prof. R. L. Samoilovitch. The purpose of the expedition is twofold: (1) To relieve the Russian staff who established the most northerly radio station of the world; and (2) then to proceed in a south-easterly direction to the uninhabited Northern Land (pre-war Nicholas II Land) where Mr. G. A. Ushakov—an experienced Arctic explorer—a hunter, a geologist, and last but not least a radio expert, will remain. This party of four will construct their own living quarters and a hut for the installation of a short-wave station. If climatic conditions make it impossible to relieve this party next summer, they have orders to cross the ice to the Taimer peninsula, Northern Siberia, and to make their way to the mouth of the Yemsei. The *Observer* correspondent adds that, "The present expedition will promote the Soviet policy of girdling the Russian polar territories with radio stations, which by reporting Arctic conditions are believed to contribute materially to the accuracy of weather prognostication. SCOTLAND.—The *Electrician* gives a brief account of the telegraphic equipment of the *Scotsman* offices in Edinburgh which "have now direct communication with the Houses of Parliament and the principal London news agencies by means of voice-frequency telegraphy, enabling a maximum of 12 channels of communication to be established on one telephone circuit." Our contemporary adds that "The installation was designed by the Societe d' Etudes pour Liasons Téléphoniques et Télégraphiques, Creed printers being used on some of the channels." SWEDEN.—The report of the *Telegrafverket* (Telegraph Board) for 1929 is one of the few of the European administrations which can show satisfactory reports for both telegraph and telephone. Sweden had the largest increase in the number of telephones since 1918. The number of Inland telegrams increased 1.1%, and that of telegrams to foreign countries by 2.3%, and that in the latter case, while foreign telephone conversations increased by 27.5% as compared with 8.7% the previous year. *How was it done?* The number of broadcasting licences also increased by 75.4 per 1,000 inhabitants, according to Reuter's Trade Service, Stockholm. SYRIA.—The Esperanto journal, *La Interligilo de l' P.T.T.*, in its July number, gives the following interesting traffic items in connexion with the Radio Centre of Beyrouth, run by the Radio-Orient Company. Telegrams dealt with:—

Year.	*Forwarded.*	*Received.*	*Total.*
1923	576,400	303,800	880,200
1924	688,450	440,100	1,128,550
1925	775,500	607,700	1,383,200
1926	812,100	820,700	1,632,800
1927	871,000	990,500	1,861,500
1928	937,800	990,500	1,928,300
1929	1,077,600	1,154,000	2,231,600

U.S.A.—The *Evening News* (London, Eng.) reports from St. Louis the conviction of an Englishman there for operating an unlicensed wireless transmitting station at his home. Mr. George W. Fellowes therefore has the unenviable distinction of being the first person to be convicted under the Federal Wireless Act of illegally operating a short-wave station. He has been sentenced to one year's imprisonment and paroled for deportation as an undesirable alien. *Two stations working on the same wavelength!*—According to *The Electrical Review*, the two stations WHO at Des Moines and WOC at Davenport, Iowa, have, unknown to the public, been experimentally working on a common wavelength so successfully that they have filed an application with the Federal Radio Commission for authority to synchronise during unlimited hours as a regular operating schedule. The stations owned by the Central Broadcasting Company were formerly competitors, dividing time on the same 1,000 kilocycle wavelength. They are separated 160 miles geographically, and each station uses a power of 5 kw. *Prohibition and Wireless.*—If Paris has to report the discovery of three illicit wireless transmitting stations, New York has not been long in equalising, for Reuter's agency in that city, a week or two back, reported the arrest of seven persons in the exclusive quarter of Suffolk County, Long Island, charged with conspiracy to violate the Prohibition laws. Three tons of wireless apparatus were confiscated, the three illegal transmitting stations having been used, so it is alleged, to guide liquor-laden ships to a safe land fall." "The sets," so reads the report, "were powerful enough to connect

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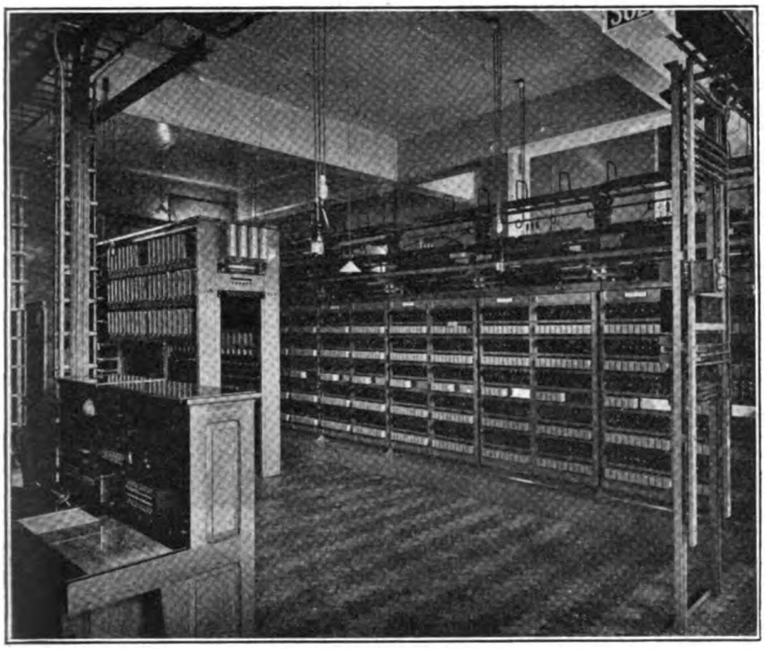
with Bermuda, Cuba, Bahamas, Halifax (N.S.W.) and even Europe." WEST INDIES.—*Dutch Telegraph Concession.*—We are informed by *The Electrical Review* that the I.T. & T. Co. has announced that the Netherlands Government acting through the Governor of Curacao, has granted the All-America Cables Co.'s system a concession to build a 600-mile cable connecting Curacao and Aruba and Bonaire (Dutch West Indies) with the All-America Co.'s cable lines to the South American mainland and with the West Indian system. The concession supplements last year's agreement whereby the All-America Cables Co. was given communication facilities in Curacao.

Deed and Motive.—" What caution must men use
With those who look not at the deed alone,
But spy into the thoughts with subtle skill ! "
Dante's " Inferno."—J. J. T.

THE SATELLITE EXCHANGES AT NOTTINGHAM.

IT was two and a half years ago that Nottingham telephone subscribers were first inducted into the benefits of automatic working with the official cut-over of new automatic exchanges at Central, Sherwood, Arkwright Street, and Basford, totalling 12,500 lines.



GENERAL VIEW OF CARLTON SWITCHROOM.

These four exchanges were equipped for the British Post Office by Automatic Telephone Manufacturing Company, Ltd., Strowger Works, Liverpool, and to them have now been added four additional satellite exchanges —Arnold, Beeston, Bulwell and Carlton, equipped by the same company.

All four exchanges are designed to operate on the 5-digit system, and are equipped with homing rotary lineswitches, and discriminating selector repeaters.

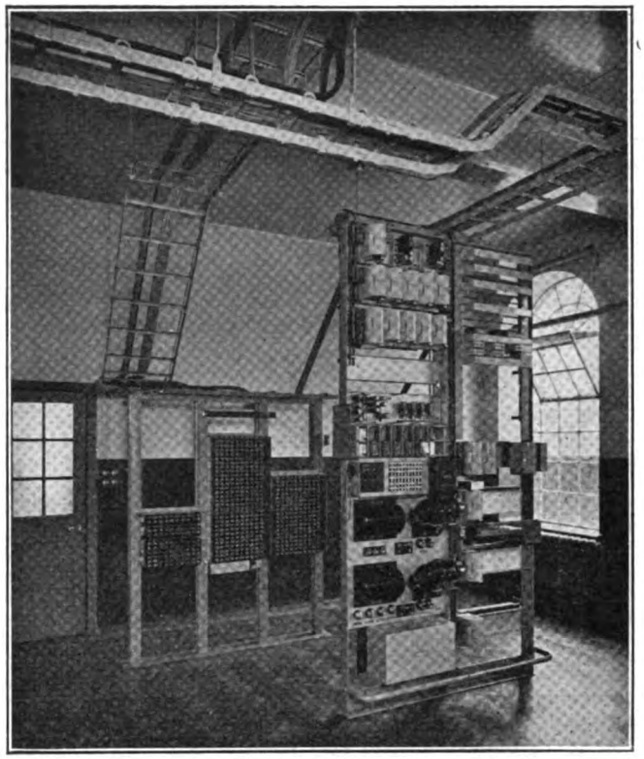
The respective capacities are as follow :—

	Present.	*Ultimate.*
Arnold	500	1,400
Beeston	900	3,000
Bulwell	600	1,400
Carlton	700	2,100

All four are satellites to the Main or Central Exchange, the principle of operation being as follows :—

When a subscriber removes his receiver preparatory to dialling he operates the associated line relay. This, in turn, immediately rotates the rotary lineswitch from its home position until it locates a contact connecting with a disengaged discriminating selector repeater. This found, the lineswitch ceases to hunt and the cut-off relay extends the loop to the discriminating selector repeater. Associated with the latter is a junction finder rotary lineswitch which immediately hunts for a disengaged junction to central. When found, dial tone is automatically returned to the caller, signalising that dialling may commence. The whole of the foregoing action takes place within the brief period between lifting the receiver and locating the first digit preparatory to dialling.

Dialling the first digit raises two selector shafts simultaneously to the corresponding level, viz., that of the discriminating selector repeater at the local exchange and that of the first group selector associated with the seized junction at Central. The wipers of both switches then automatically rotate ; that of the discriminating selector repeater releases, whilst the first selector



ARNOLD EXCHANGE—METER RACK, ALARM EQUIPMENT AND SPECIAL APPARATUS RACK.

at Central hunts for an outlet to a disengaged second selector. Dialling the second digit again operates the discriminating selector repeater, together with the second group selector at Central. Both shafts rotate. Should the first two digits imply a local call the discriminating selector repeater will hunt over the corresponding level for a disengaged third group selector in the local exchange. Simultaneously the junction loop to Central is opened, releasing all switches held there.

The call now proceeds in the usual way, the third, fourth and fifth digits dialled operating the third group and final selectors respectively.

Alternatively, in the case of a call for a number associated with another exchange having reached the stage of the second digit at which both the shafts of the local discriminating selector repeater and of the second selector at Central are stepped to the same level, the former remains in this position, the local switch simply acting as a repeater for the remainder of the digits dialled, which operate the distant third group and final selectors in the usual way.

Removal of his receiver by the called subscriber reverses the battery on the lines between the final selector and the discriminating selector repeater, thereby causing the meter to function and record the call against the caller.

Should all junctions to Central be engaged the junction finder rotary lineswitch will rotate to its 24th contact and dial tone will be returned to the caller.

In the event of a local number being dialled the call will proceed as usual, but in the case of a call for a number on another exchange busy tone will be returned after dialling the second digit.

In the case of P.B.X. lines, dialling the first number of the group ensures automatic hunting for a disengaged line, and ultimate connexion and ringing over that line when found.

Enquiries, trunks, phonograms, &c., are handled by manual operators at Central, whose services are enlisted by dialling " O."

Junctions incoming from other automatic exchanges in the area terminate on third selectors in these satellite exchanges, as do also direct junctions from the manual switchboard at Central. Thus the operators can obtain access to any subscriber by dialling three digits only.

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CORRESPONDENCE.

HOW TO IMPROVE THE TELEGRAPH SERVICE.

TO THE EDITOR OF "THE TELEGRAPH AND TELEPHONE JOURNAL."

SIR,—For a member of the "general body" to set out to discuss the present state of the Telegraph Service, with a view to its improvement is, in the nature of things, a task of extreme difficulty.

Lack of knowledge with regard to such vital factors as costs, traffic, staffing, &c.; the almost insuperable difficulty of obtaining a full and comprehensive view of the subject; the disposition which seems inherent in the rank and file to regard with suspicion every *demarche* of the official mind; the narrowness of outlook consequent upon attachment to a particular office—these are some of the considerations which make one painfully conscious of one's limitations. Only a keen sense of the importance of the subject from a telegraphist's point of view will serve to overcome the very natural diffidence with which one approaches so complex and difficult a subject.

Having thus "drawn the teeth of the critics," I may, perhaps, be permitted to make a few observations on the present position as seen through the eyes of the "man at the machine."

It would be ungenerous not to acknowledge that much has already been accomplished. A very considerable speeding up has been effected, so that delay, if not yet minimised, has been materially reduced. Apparatus of a type which has many advantages over anything hitherto in use is being rapidly standardised.

Output per operator has been increased and various economies effected, with the result that the figures of the telegraph deficit have been very substantially improved.

But while much has been done to achieve the first essential of an efficient telegraph service—speed, very little progress has as yet been made towards the second desideratum—accuracy. Indeed, it would probably be safe to say that the number of telegraphic errors have tended to increase rather than diminish.

A high standard of speed combined with accuracy presupposes a staff intelligent, highly trained and experienced, conditions which certainly do not obtain at present, at any rate during that period of the year when pressure is at its highest. It is to be hoped that the whole question of staffing during the summer months will receive the urgent attention of the administration. In this connexion there has been of late a somewhat disconcerting tendency to run away from proposals and recommendations which are, intrinsically at least, worthy of trial.

The work of maintenance in the smaller provincial offices still leaves a good deal to be desired, though here again something has already been accomplished.

Circulation in the larger offices continues to be a weak point and is responsible for far too many cases of individual delay. Some improvement here may doubtless be looked for with the arrival of the "endless band carrier" and a more highly specialised staff.

But the problem beside which all others seem simple, the problem which is at once the most urgent and the most difficult, which is vital to the very existence of the service as we know it to-day is surely that of *Traffic*.

Steadily, silently, relentlessly, the figures of traffic continue to fall. With a feverish haste offices are being fitted with apparatus capable of carrying a high maximum load under conditions which involve long periods of idleness within the limits of the twelve hours which make up the telegraphic day.

It is safe to say that during the greater part of the day many circuits are not now working up to more than 25% of their maximum capacity.

It may very well be that the teleprinter has advantages which override even the deadweight of a dwindling traffic, but it is surely a moot point how far it remains an economic proposition to install and maintain an expensive type of apparatus under conditions which presume long periods of idleness. How to arrest the present falling away of traffic—this is the real problem before the telegraph administration.

A good deal has been heard of advertising, but up to the present little has eventuated; it is very doubtful whether advertising by itself can be carried on upon a scale likely to attract any considerable amount of traffic. Advertising *plus* a reduced tariff is another matter.

It seems to be generally believed that no modification of rates is possible which would not involve an actual loss of revenue, but on this point the arguments are not altogether convincing.

If a modification of existing rates along the lines of the zone system is considered inadvisable, might it not be possible to secure, if not a large, at least a moderate increase, together with a more even distribution, of traffic over the twelve hours by reductions in rates over specific hours—say, for example, before 10 a.m. and after 2 p.m.

Is there not some hope that any resultant fall in revenue might be counterbalanced by a moderate increase of traffic plus economies which might be expected to result from a more even flow of work over the twelve hours?

There is another aspect of the rates problem which may justly be emphasized. At a time when the prices of all commodities and services have fallen considerably below the level of, say 1922, telegraph rates remain unchanged at double the pre-war figures; when the leaders of industry are straining every nerve and sinew to reduce overhead charges and to lower in every possible way the costs of production, it might reasonably be expected that the telegraph service would not be slow to make its contribution, however small. It will doubtless be urged that the cost of telegrams is an infinitesimal part of the overhead charges of any great industry, but the present position of the country is sufficiently serious to justify a call upon each constituent part.

For these, and other reasons, it is to be hoped that the subject of telegraph rates will receive that careful and exhaustive consideration which its importance amply justifies.

July 29, 1930. TELEGRAPHIST.

AN EARLY TELEPRINTER.

TO THE EDITOR OF "THE TELEGRAPH AND TELEPHONE JOURNAL."

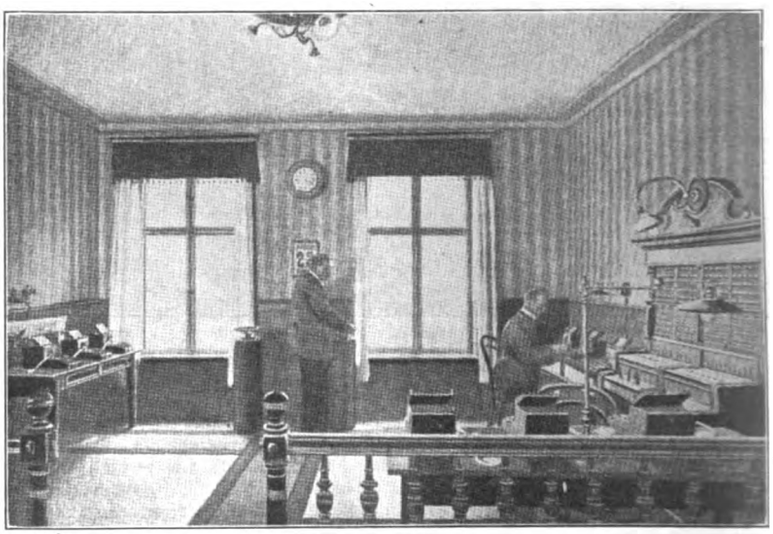
SIR,—There has been a good deal of interest taken during the last few years in the production of a Telegraph Exchange service, in which subscribers may be connected to each other on request, in much the same way as telephone subscribers are dealt with.

In many directions there is an impression that such an idea is a recent one. For instance, the *Telegraph and Telephone Age*, in its issue of Jan. 1, 1929, wrote as follows:—

"Probably one of the first references to a teletype exchange was made by D. Murray in a paper he read before the British Telegraph Engineers in 1924," &c.

As a matter of historical interest it should be mentioned that such an exchange was established in Berlin 21 years previously, viz. in 1903, and details were published in the *Elektrotechnischen Zeitschrift*, Heft 12, 1904. The article is a long one, as it goes into every detail of the teleprinter of that day, made by Messrs. Siemens & Halske, Berlin. It was known as the "Elektrischer Ferndrucker." It had 28 keys arranged in four rows and worked at about 20 words a minute, giving printed characters of letters and figures on a paper tape.

An illustration of the exchange is shown in the accompanying figure, with several of the Ferndrucker machines, arranged around the room for answering subscribers.



FERNDRUCKER EXCHANGE, BERLIN, 1903.

The exchange itself is of the ordinary pattern of those days and needs no description.

The article gives the speech made by Adolfe Franke, Dec. 15 1903, as follows:—

"Gentlemen,

As you have learned from the newspapers, the Electric Ferndrucker Co., on Oct. 1 of this year, as the result of a contract with the Reichs Postamt, has established a public exchange for teleprinter working in Berlin. Subscribers can receive not only general news, telegrams, political news, stock exchange news, &c., all being served at the same time; but

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they can also be put into immediate telegraphic communication with each other. With this latter arrangement, the telegraph to some extent enters the domain hitherto confined to the telephone."

The Ferndrucker machines are still in considerable use in Germany, there having been at one time some 400 in the Berlin Central Telegraph Office. It was tried in this country somewhere about 1904, but it did not meet with the success it deserved and was eventually abandoned. Had it been successful there is good reason to suppose that the exchange system associated with it would have followed in due course. The machine cannot, of course, compete with the modern teleprinter working at a speed of 60 words a minute or even higher; but in those days the telegraph operators were mainly Hughes operators working at a speed of about 27 words a minute.—Yours sincerely,

July 29, 1930. A. C. BOOTH.

THE "ADVISORY" SIDE OF CONTRACT WORK.

TO THE EDITOR OF "THE TELEGRAPH AND TELEPHONE JOURNAL."

SIR,—When I read the article by "SHERWOOD" in the August *Journal*, I wondered, as a Contract man, if it could be true that our work was being carried out within the narrow compass of a mere desire to obtain orders for more stations. To be told that such additions to P.B.X. installations were being made without regard to efficiency made me hot, but, on reflection, I felt sorry for the writer in his limited appreciation of subscribers' control of their business and the wide organisation of expert staff which is engaged and trained to tactfully approach subscribers in their interests.

Our officers in the Contract Branch gladly avail themselves at all times of the expert advice which is readily afforded by the Traffic officers, and our Contract Managers spend their lives in seeing that the full technical experience of our service is offered to the public as occasion demands.

Having regard to the close co-operation which exists between the branches in order to make our service a public one, as it should be, I am at a loss to appreciate the suggestion that more advisory officers are needful. All the duties proposed are now being carried out excepting the compilation of another card index which would, to a large extent, again duplicate existing records.

It would indeed be helpful if a large number of P.B.X. subscribers would tell us their probable requirements for the ensuing year, but our experience is that subscribers know probably less than we do with our expert knowledge, especially in these times of depressing outlook in industry.

By all means make use of the points enumerated by "SHERWOOD," but take advantage of the extensive organisation which is already at our disposal.

I am certain that any misconception in the minds of the telephone public is not created by a lack of the "personal interest touch" in the Contract Branch.

Aug. 16, 1930. GEO. E. NICHOLLS, L.T.S.

ADVERTISING.

TO THE EDITOR OF "THE TELEGRAPH AND TELEPHONE JOURNAL."

SIR,—To-day the accepted method of pushing one's wares is advertising. All the great industrial and commercial concerns are convinced that it pays to spend thousands of pounds on press and poster advertising. Some day, perhaps, this fact will become evident to the powers who control our telephone service.

Here we have the spectacle of the public seething with discontent. The delay in fixing a new installation, the month it takes to move the 'phone from one room to another, the wrong numbers they get, the overcharging of calls, &c.

What do we do to counteract this discontent? Waste thousands of pounds sending civil servants around knocking at the doors of these discontented subscribers who are already sick of the word telephone; or knocking at the doors of people who are prejudiced beforehand owing to the reputation the service has. Further, the people who form the larger part of subscribers or potential subscribers hate being molested. They display notices on their doors to this effect: *No Hawkers. No Canvassers.*

A wise administration would seek to woo the public by discreet advertising. Persistent repetition in the Press of the value of a telephone and the growing numbers of new subscribers. The whole leading to an atmosphere of "All's Well" with the telephone. It is the atmosphere that counts.

For obvious reasons I cannot sign my name, but I rely on the fairness of the *Journal* to publish the opposite side to the recent boom of canvassing. —Yours, &c. A. D.

[We see no reason why A. D. should not have enclosed his card. However, we accept his challenge (if not his conclusions), and make an exception to the usual journalistic rule that anonymous letters cannot be published.—ED., *T. & T. J.*]

PROGRESS OF THE TELEPHONE SYSTEM.

THE total number of telephone stations in the Post Office system at June 30, 1930, was 1,911,827, representing an increase of 9,922 on the total at the end of previous month.

The number of stations working at June 30 in London, England and Wales (excluding London), Scotland, and Northern Ireland was as follows:—

	No. of Stations at June 30, 1930.
London	686,840
England and Wales (excluding London) ...	1,033,434
Scotland	167,818
Northern Ireland	23,735

The growth for the month of June is summarised below:—

	London.	*Provinces.*
Telephone Stations—		
Total at June 30	686,840	1,224,987
Net increase for month	3,545	6,377
Residence Rate Subscribers—		
Total	170,504	265,562
Net increase	1,133	1,609
Call Office Stations (including kiosks)—		
Total	6,203	26,023
Net increase	56	294
Kiosks—		
Total	1,883	6,726
Net increase	55	123
Rural Party Line Stations—		
Total	—	9,874
Rural Railway Stations connected with Exchange System—		
Total	17	1,752
Net increase	—	42

The total number of inland trunk calls dealt with in April, 1930 (the latest statistics available) was 9,906,760, representing an increase of 367,059, or 3.8%, on the total for the corresponding month of 1929. Outgoing international calls numbered 45,543 and incoming international calls 48,689, the increases over April, 1929 being 2,541 (5.9%) and 2,860 (6.2%) respectively.

Further progress was made during the month of July with the development of the local exchange system. New exchanges opened included the following:—

LONDON—Ewell.

PROVINCES—Alves, Barr, Bovington Camp, Broadhaven, Burn, Camblesforth, Clawdd Newydd, Crossmichael, Drumlithie, East Knoyle, Eccleston, Hackleton, Hebron, Kildrummy, Ochiltree, Stoke-Fleming (all rural automatic); Hastings;

and among the more important exchanges extended were:—

Altrincham, Birmingham (Central), Cowes, Evesham, Helensburgh, Nuneaton, Rugby, Sale, Shanklin, Stafford, Tattenhall, Wishaw.

During the month the following additions to the main underground system were completed and brought into use:—

Peterborough—Market Deeping,
Exeter—Honiton,
Grantham—Sleaford,

while 78 new overhead trunk circuits were completed, and 82 additional circuits were provided by means of spare wires in underground cables.

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PROFESSOR GRAHAM BELL'S WONDERFUL INVENTION.

[A NEWS-CUTTING FROM 1877].

THE following reprint of a report in the *Western Morning News*, Aug. 22, 1877, will have more than a historical interest for our readers :—

Professor Graham Bell, of Boston, received with loud applause, next proceeded to address the section on the subject of his wonderful invention, the Telephone. He stated at the outset that after the lecture delivered by Mr. Preece it would be scarcely necessary for him to put before them a description of the construction and the operation of the telephone in its present form, but he thought it would be interesting if he took up the subject in another light, and showed the evolution of the telephone and described to them the process by which the instrument had been brought up to its present state. Having alluded to the fact that it was now some years since that his attention was first directed to the form of the vibrations of the air during the production of speech, and having pointed out that he was not aware how the idea of using electricity as a means of conveying these vibrations from one place to another suggested itself to him, the Professor gave an interesting account of the time and labour which he, assisted by Dr. Clarence J. Blake, Professor Pearce, and other friends on the other side of the Atlantic, had devoted in endeavouring to discover some means by which the sound of the human voice could be successfully conveyed to whatever place was desired. He gradually traced the progress of these researches, and enumerated the different forms of instruments which had been invented for the purpose of accomplishing the object desired, several of which instruments he exhibited, at the same time explaining that experiments were still being made in Boston with a view to further improvements in, and in the further development of, the telephone. He confessed that he did not yet know which was the best form of instrument that could be used, reminded his audience that he did not bring the invention before them as a perfected one, that it was still in embryo, but expressed a hope that at the next meeting of the British Association he might have the opportunity of producing before them still more perfect forms of the instrument. The Professor then announced that he had brought with him his telephonic organ, and that he should presently attempt to produce a little "bad music" for the benefit of the Association. This organ, he explained, resembled a harmonium or popular organ. The reeds were all connected with a battery, and in front of each reed there was a little screw with a platinum point. When the instrument was blown the reeds vibrated against the screws, which were all connected with a telegraph wire, which had been brought into that room, and contact being made the music was thus conveyed. He also explained that the organ was in the Guildhall, and that telegraphic communication had been made between that building and the Post Office, and between the latter place and the room in which they were then assembled. Experiments with the instrument were then proceeded with, the telegraph wire being attached by Mr. Preece to a telephone with a powerful battery, and with a somewhat capacious "mouth"; Harris, Mr. Preece's assistant, who was stationed at the Post Office, was then communicated with by that gentleman and told to request the organist to strike up, and almost immediately the audience were astounded by hearing with perfect distinction the well-known air, "God Save the Queen." The organist was then ordered, through Harris, to play "something with chords" and again the sounds of music were clearly heard, although this time the tune could not be recognised. Another instrument, without a battery, was then connected with the wire, but as Mr. Bell had prophesied, the sounds of music conveyed to the audience by means of this instrument were very faint, being audible only to those at the top of the room. The first instrument was not again used. Harris being requested by the Professor to sing as loudly as possible, in a second or two the favourite song "Auld Lang Syne" was heard with remarkable clearness, although many of the notes were somewhat shaky. Harris next read a newspaper paragraph and although the sound of his voice was distinctly heard, no one was able to ascertain the subject of what he was reading. Professor Bell explained the reason of this, and informed the audience that the louder the voice was at the transmitting end, the more distinctly it was heard at the other end. Mr. Varley here rose, and "on the ground of nationality" remarked that he thought the experiments made by his brother, Cromwell Varley, claimed for him, as an Englishmen, the honour of having taken a part in the invention of the telephone. He wished to ask the Professor whether it was true or not, as stated by the Press, that during a concert in America the music of a full string band was by means of a telephone distinctly conveyed to a considerable distance, and whether the voice of a lady who was performing a solo was also heard in the same manner, and recognised. Professor Bell remarked that he was very sorry Mr. Varley wished to repudiate him as a British subject (*applause*). He considered it an honour to have been born and to have lived the greater part of his life on this side of the Atlantic (*loud applause*). He had only been for five years in the United States. With regard to Mr. Varley's question, he would first say that he was not answerable for what appeared in the Press (*hear, hear*). It was not true that any such concert had been given, neither did he believe such a thing as the speaker had detailed possible in the present state of the telephone. What, however, might be possible in the future he would not predict. This much was true, a telephone had been placed on a chair in the midst of a brass band, a wire from which instrument was connected with his (the speaker's) laboratory. This was done for the purpose of observing the effect, and whilst he was listening he heard the men tuning up their instruments, and finally he distinguished the music of the full brass band. The notes were out of proportion, the lower ones being the most distinct. At his request the cornets were played nearer the instrument—about 2 feet—and he was then able to hear the full harmony. It was quite true that the singer and the speaker could be recognised by the voice. He could recognise the voice of his friends after he had become accustomed to the peculiar modifying influence exerted by the telephone itself.

On the motion of the Chairman, a cordial vote of thanks was conveyed to the Professor for his admirable and interesting lecture, and the section then adjourned.

THE SERVICE INSPECTOR.

BY W. F. HOUGH, *Service Inspector, Liverpool.*

THERE are some jobs even in the P.O. Telephone Service which are considered fairly "cushy," according to the standards laid down by "Pro Bono Publico" and his like, and, in the Service itself, that of the Service Inspector appears to be regarded as distinctly "jammy."

That it has its compensations one of them at least will admit, though there are times when the "pill" is more in evidence than the jam.

The qualifications necessary to a good Service Inspector are somewhat varied, and it is to be feared that few are so gifted as to possess them all. From a Departmental point of view he ought, of course, to be more useful than ornamental, but his appearance needs to command some respect, if only to distinguish him from the vendors of buttons and shoelaces, vacuum-cleaners, and insurance policies. His manner should be above reproach when on duty, conveying a sympathetic interest in the subscriber's misfortunes, if any, and his knowledge of the telephone service and its ramifications should be profound—or appear so. His physical attributes, apart from a face with the usual features and a complete set of limbs, should include the ability to walk a considerable distance in the course of a day, particularly where rural exchanges are under review, and a philosophical indifference to the weather is advisable. It is not pleasant to get wet through; to feel your fingers numb with cold, or to find your perspiring face a source of refreshment to every thirsty insect that flies; but to such your fate condemns you according to the season. His equipment is scanty, a stop-watch, a ghastly imitation of a receiving set associated with a bit of rubber tubing like a small garden hose, and a bag, delightfully engraved back and front, as a sign of good faith. With these he sallies forth to face the world and his wife, to listen to their moans, or receive their congratulations. If the moans have it, life is not a bed of roses but it speaks well for the service generally, and for human nature in particular, to find that the great majority of the subscribers are in the long run unable or unwilling to commit themselves to a definite expression of dissatisfaction. This desirable result naturally depends to some extent on the tact displayed by the S.I. in dealing with the points raised during his tour in the smoothing over of those little difficulties—due perhaps to "nerves" on the part of the operator, or the subscriber, or both, and doing it without having reference to higher authority.

To him, however, is neither the power nor the glory; to the operator he is but a nebulous thing, one who occasionally makes observations which lead to trouble, and to the subscriber his limitations are apparent as soon as he finds that the exigencies of the service run counter to his desires. If the results of his observations are favourable they may induce a glow of satisfaction in the bosom of the officers-in-charge, but the service inspector is not conscious of it, and if otherwise—well, he doesn't make any more trouble than he can help.

His peregrinations take him to many diverse places; mansions and cottages, offices and shops, and the subscribers vary as much as their habitat in their method of reception and their appreciation of his errand.

It may even be remarked that he has been known to have liquid refreshment offered him in the various forms (and not always is it tactfully declined), and an interchange of smokes is of fairly frequent occasion where the subscriber's interest in the visit overshadows its object. Invariably then, his reception is all that can be expected, and having passed the outer defences he is introduced to the instrument that justifies his existence. Here, again, he is likely to find a multiplicity of positions to which this symbol of the service has been relegated, to hall and outhouses, bedrooms and cellars, it is necessary for him to insinuate himself in order to carry out the desired test and record of his call.

There are subscribers who appear to consider the method unfair to the operator, but this usually applies to places where the exchange is small and the subscribers few, where operator and subscriber are well known to each other and dwell in amity. There are others who receive you with pleasure, carry out your wishes, and, when you are safely off the premises pass the word along to their friends at the exchange—but human is "sich." As a general rule the subscriber on those exchanges far from the centre of things welcomes a visit because he realises that his interests are being considered and that it is not only his money the Department seeks, hence the gratifying reception usually experienced. In one case, however, it must be admitted, in spite of the fact that he was the possessor of a fairly honest face, a suspicious maid advised the police of his presence in the district, but that was because he was, unfortunately, following an enterprising individual who had been collecting subscriptions for something that didn't exist. In that case, however, the law wasn't a "hass."

Taking it all round, then, the job isn't really a bad one, and it is not thought there will be any lack of candidates for the position when a vacancy arises.

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LONDON TELEPHONE SERVICE NOTES.

Contract Branch Notes.

THE business done by the Contract Branch during the month of July resulted in a net gain of 3,295 stations.

An American View.—Recently representatives of an American company arrived in this country with the object of obtaining gramophone records of features from London scenes for use in America.

Having obtained the co-operation of a popular gramophone company our American visitors were quickly introduced to a section of the Contracts Branch, L.T.S., which is quite well known among British gramophone recording companies.

In response to a telephonic message regarding the provision of certain wires the caller was invited to visit Cornwall House, when it was ascertained that four rather long private wires were required within two days.

Within 30 minutes all financial and engineering arrangements had been completed and our visitors left Cornwall House assured that their requirements could be met.

As is usual, the London Engineering District were equal to the demand, and it is gratifying to learn that the items "on the wax" were perfect as gramophone records.

It is pleasing that our visitors thought it necessary before leaving this country to record their impressions of the London Telephone Service in the following terms :—

"Gentlemen,

I want to take this opportunity to thank your organisation for the splendid work you have done on our behalf during our stay in London. Believe me, Sirs, we shall carry away with us from London memories of a most pleasant association with your great institution, and a deep and sincere appreciation of the unusual exigencies of time and labour which you met so successfully for us.

I do not know at this writing whether or not we shall require additional service facilities from you, but I do know that I cannot help writing this enthusiastic and grateful letter to you.

Yours very sincerely,
for Warner Bros. Picture Inc.
and Brunswick Radio Corporation.
(Signed) EDWARD E. VOYNOW."

The "Loud Speaker."—An officer of the Contract Department was recently making enquiries about the character and possibilities of a neighbourhood for the purpose of preparing an estimate of the probable telephone requirements.

Included among the many people interviewed was a communicative individual who was apparently not quite clear as to the precise nature of the enquiries being made.

After discoursing at some length on the shortcomings of his neighbours he concluded by saying, in a confidential tone : "And I tell you, Sir, I know of several people hereabouts who put their aerials out in the evening and take them in again before the morning."

Further Education.—It is proposed during the winter session of 1930/31 to organise a series of classes under the auspices of the L.C.C. and City Literary Institute for the benefit of the staff. Preliminary notices have already been circulated to each Contract Office and further announcements will be made shortly.

The staff are invited to study the extensive list of subjects which will be available, and to take advantage of the many facilities offered.

Obituary.—It is with regret that we record the death of Mr. N. J. Majeran, a Clerical Officer attached to the West Contract Branch of the Telephone Service.

Mr. Majeran joined the service in 1913 and, with the exception of the war period, had been attached to the West Office the whole time.

He was a student of the London University, and was exceptionally gifted in respect of languages and generally a promising future appeared to be in store for him.

He started his annual leave on July 26, and it was his intention to motor in his car, accompanied by his wife, sister-in-law and three children, through Belgium, Germany and into Austria. Unfortunately, on the second day of his holidays, Sunday, July 27, an accident occurred in the Mons area in which his car came to grief, and he was instantly killed, the other occupants of the car being more or less seriously injured and taken to the local hospital. His remains were brought to London and interred in the Jewish Cemetery at East Ham on Sunday, Aug. 3. The L.T.S. was represented at the funeral by Mr. G. W. Livermore, the District Contract Manager, while other members of the staff attended to pay their last respects to a beloved colleague.

L.T.S. Sports Association.

Tennis.—The annual competitions for the "Cox" Cup, Ladies Doubles, and the "Pink" Cup, Ladies' Singles, are now nearing completion.

In the former, A.R.1, Accounts Section, have reached the final, having beaten Clerkenwell, the present holders, in the semi-final. Central and A.R.7 have yet to play their semi-final match. The winning team will, of course, have to meet A.R.1 in the final, which is to be played on the Chiswick Civil Service Ground on Saturday, Sept. 20, at 2 p.m.

In the "Pink" Cup tournament Miss McGlade, of Trunks, and Miss Harper, of Toll "A," have reached the semi-final.

Miss Wilson, A.R.1, Miss Godfrey, Toll "A," Miss Parker, Maryland, and Miss Fleet, Central, or Miss Whittaker, East, have still to play their fifth round. The final in this competition will also be played at Chiswick, on Saturday, Sept. 20, at 2 p.m.

Badminton.—A club has now been organised and will commence the season on Monday, Oct. 6, at 5 p.m. A hall has been hired in Gaskell Street, Stockwell, from 5 to 9.30 p.m. on Mondays throughout the season. The subscription is £1 per annum. The club, which will be known as the "Eltess," can only accept 20 members in the first instance, but if sufficient applications are received additional accommodation will be sought. All communications with regard to this section of the L.T.S.S.A. activities should be addressed to Mr. A. Hough, Balance Duty, L.T.S., Cornwall House, S.E.1.

Cricket (Contract Branch).—A glorious opportunity to annex the cricket shield was upset by the Traffic Branch in the match played at Chiswick on Aug. 12.

The Contract Branch were playing their last match of the season, having previously defeated all their competitors during the summer, and only needed to draw this game to be certain of winning the trophy.

But the occasion proved too much for them. Batting first the Traffic Branch piled on runs at a rapid rate and declared at 140 for 6 wickets. Of this total Kerwin played fine cricket in collecting 93 runs. The Contract Branch had little chance of beating this total and, with the light failing rapidly, played for a draw, but their efforts were unavailing and they were all out with 10 minutes to spare for under 40 runs. The result of this match leaves the final destination of the shield open.

To tie with the Contract Branch the Accounts must beat the Traffic Branch in the final match to be played early in September. A draw or a win for the Traffic will leave the Contract Branch champions.

Post Office Ambulance Centre.

Annual Competitions.—The Final Annual Competitions will be held on Nov. 19, 1930, at King George Hall, Tottenham Court Road, at 7.30 p.m.

The competition for the "Corps" Trophy (Individual Test) will take place on Nov. 3, 1930, and the closing date for all entries for the competitions is Oct. 20, 1930.

It is hoped that as many members as possible of the P.O.A.C. will take part in these competitions and that all readers will at least buy a programme and come and watch.

Miss E. K. M. Meeser,
Controller's Office, L.T.S.,
Cornwall House, Waterloo Road, S.E.1.
Mr. J. E. G. Rogers, I.S., Mount Pleasant, E.C.1.
} *Joint Competition Secretaries.*

Personalia.

Resignations on Account of Marriage.

Assistant Supervisors, Class II.

Miss L. I. Smails, of Bermondsey.
Miss H. S. Currie, of Regent.

Telephonists.

Miss D. Limbert, of Albert Dock.
" A. E. Lane, of Brixton.
" M. F. Calcutt, of Central.
" K. G. Holmwood, of City.
" E. L. A. King, of City.
" G. A. Holmes, of Clerkenwell.
" V. E. Hart, of Clerkenwell.
" L. M. Paxton, of Clerkenwell.
" K. M. Eaglon, of Clerkenwell.
" A. Evans, of Clerkenwell.
" M. W. Stenner, of Clerkenwell.
" M. E. Taylor, of Clissold.
" E. L. Williams, of Croydon.
" E. C. Port, of Eltham.
" B. M. Smith, of Frobisher.
" E. M. Jacobs, of Greenwich.
" V. Davis, of Grosvenor.
" I. Gough, of Grosvenor.
" K. Mawer, of Hampstead.
" I. L. Judd, of Hatch End.
" L. A. Larney, of Hop.
Miss L. M. Hunt, of Hop.
" W. E. Britchner, of Hop.
" W. J. Hynds, Kingston.
" V. A. Cox, of Maryland.
" D. M. Cosson, of Monument.
" G. E. Ranger, of Museum.
" E. Repuke, of North.
" E. M. Brown, of Pollards.
" L. D. Towell, of Purley.
" V. Foster, of Rodney.
" E. A. Farr, of Streatham.
" F. L. Secker, of Trunk.
" E. C. S. Connor, of Trunk.
" W. Hughes, of Trunk.
" E. G. Harding, of Trunk.
" E. M. Webb, of Victoria.
" E. Rodgers, of Victoria.
" E. E. Martin, of Wanstead.
" M. A. Mold, of Western.
" V. L. M. Cobb, of Western.

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Holiday Correspondence.

THE greatest menace to the perfect enjoyment of a holiday is correspondence. There are four kinds—firstly, there are the letters and cards we send to our friends: secondly, those that our friends think we ought to have sent: thirdly, those that we receive, and lastly, the letters that we find on the mat when we return home. The first and the last are the most deadly: the second would involve an extension of day duty well into the night and an expenditure which would render the holiday financially impossible. The third group is not an unmixed blessing, and the larger it is the greater is the reaction on the first and second groups. It is all very well to find a letter waiting for us on the breakfast-table, but after the first joy of reading is passed we reflect unwillingly that the sender rather expects an answer. The more we consider the task the greater and more onerous does it appear until at last we determine to send a reply—but later on in the holiday. Once that decision is taken the letter becomes a positive toothache and the only remedy is the drastic one of buying post cards and writing.

The letters and post cards we send—spontaneously and without the "in reply to yours" urge—are a matter mainly for conscience. Really methodical people, before they go away, compile a list of addresses of friends to whom they ought to write and then, equally methodically, they leave the list at home. Thus, being furnished with a sound and unanswerable reason for not writing, they don't, and in consequence they can devote all their energy, spare time and cash to enjoying their holiday.

The last group consists mainly of bills and circulars. The bills are, of course, unpaid, and serve to reintroduce realism into life. We might, of course, endorse them "Read and noted," or "Read without interest," or "Read: perhaps the papers may be recharged" (they usually are), but it would only be putting off the evil day. The circulars announce "summer sales" or "summer prices"—both ironical and unkind. Summer! ha, what a summer and "sales": no more sails for a year and a day. Well, well, they will serve as winter fuel on or before the feast of Stephen.

When I returned from leave I found two letters amongst others on the mat. One was from Fra Angelico (I thought he was dead, poor chap), all about sins and beatitudes and cowls. It's wonderful what these Information Desk officers know. It was as full of corrections as a Postmasters' Manual and most informative—the knowledge displayed of the Abbot of an ancient Scots foundation doubtless affords a clue as to why the twopence (net) mentioned was not enclosed. The other was from the voluminous writer, J. J. T. He tills such an enormous acreage each month that I feel flattered that he should have found time to write to me. It was about an American degree—Doctor of Dials—not, I gathered, anything to do with the Society Cult of Face Lifting. I suppose it is a further instance of the extent to which the hire-purchase system has gripped America—in this case getting fame by degrees.

PERCY FLAGE.

A Holiday in the Tirol.

We had been told that if we intended to go to the Tirol for our holiday we must look our for "squalls" if we couldn't speak German, as very few of the natives speak English. That decided us for the Tirol—the very place for us, and at last there was to be an opportunity to make use of the bit of German I know. "The less English we come across, the better," was the unpatriotic remark of my colleague. We chose as remote a village as we could—a quaint place called Reutte—four hours auto-bus ride from Imst railway station.

We arrived at Imst all right and looked for the auto-bus for Reutte—and there wasn't one!! "A nice kettle of fish," we remarked as we repaired to the nearest hotel to book for the night. We decided that it was a very promising beginning, and we began our inquiries as to bus times and tickets. But the manager of the hotel insisted upon seeing to this himself and in addition to obtaining our tickets he wrote a note to the Postmaster of Lermoos, where we had to change buses, asking him to see us right for the rest of our journey. This was typical of the kindness shown to us by all Austrians and Germans we met. We thoroughly enjoyed our brief stay in Imst, and the memory of it will gladden the hearts of two routine-stricken W.A.'s for many a long day. We stepped into the bus next day wondering what next was in store, and whether we would ever arrive in Reutte. Two hours' ride brought us to Lermoos, and there we went in search of the Postmaster—only to be told that he was out and probably would not return before an hour was up—and our bus was due to depart within an hour. Another fix! We decided to wait about a bit in case the Postmaster changed his mind and returned to his labours. So we ambled about the Post Office to the tune of sarcastic remarks from my colleague, as to its being a pleasant change to roam about post office premises. I suggested that perhaps we had better go out into the sunshine, and what we saw there caused us hurriedly to return inside to enjoy a good laugh. Curiosity had got the upper hand of the porter from the hotel opposite and we caught him in squatting attitude in front of our luggage, examining the labels. It destroyed any vestige of seriousness that we had left, but we soon recovered ourselves when we realised that the Postmaster was not returning. However, we managed quite well without him.

The food in Austria was a constant source of inquiry, and the facial expressions of the other W.A. when anything unusual came along were wonderful to behold. In a rash moment I told her that "when in Rome I would do as Rome does," but I broke that resolution when sauerkraut was dished up. We both took a mouthful, looked at each other in astonishment, swallowed and called for "Steward." We were told that the cabbage is salted down for several months before it is eaten. It tasted to us as though it had also been buried for several months before it is eaten. No more sauerkraut for us!! We pined for good old roast beef, but no beef of any description put in an appearance. Calf seemed to be the usual flesh eaten. On one occasion we were served with some meat which we failed to recognise. It was very tender, so much so that it almost melted in one's mouth. We had tasted tender meat at home on rare occasions but none like that, and it demanded investigation. The other W.A. refused to eat it—said it was Alsatian dog (there were lots of them about there), and no amount of argument would convince her otherwise. It was dog and she wasn't eating it. We called the proprietor to settle the question and he told us it was venison. "There," I crowed, "the food of Kings and Nobles, and you have called it dog and refused to eat it." But she wasn't a bit ashamed of herself—she merely told the proprietor (much to his amusement, thank goodness) that she preferred steak and chips!! Next evening a very near semblance to steak and chips was offered to us for dinner. Victory for the other W.A.

Everyone in Austria drinks light beer. It seemed most strange at first to see young men and women seated round tables out in the sunshine with tall glasses of beer in front of them. It was the ambition of my colleague to sit in front of a glass of beer like that and there was no peace to be had with her until the ambition was fulfilled. So one hot, thirsty day we seated ourselves outside a café, and, in my best German I asked, in my ignorance, for two bottles of beer. But the Fräulein insisted that we had one bottle between us, and we let her have her way. When the bottle arrived we realised how wise she was. If we had drunk one each, Reutte might not have seen our return that afternoon.

Lemonade, as we know it here, doesn't seem to exist in Austria. Twice we ordered it, and twice "Himbeere" was brought to us. Himbeere (raspberry wine) is very nice but doesn't quench the thirst—it is too sticky and sweet.

One thing we were rudely awakened over, in more than one sense, was the myth of the quietness of a country village. In such a remote place we quite expected quietness to reign supreme—but not so. On our first morning there we were awakened about 5 or 6 a.m. by a fearful noise that sounded like a cross between a riot and civil war. We lay in bed and listened and the sounds sorted themselves out thus—about 100 cows each with a bell of different note jingling round its neck, several shepherds calling out and whacking hides with their sticks, some singing and yodelling, springless wooden carts rattling over cobblestones, their drivers loudly cracking their whips, church bells ringing, and everyone appearing to be greeting everyone else. As this happened every morning, we concluded that the Austrian liked early rising and the sound of his own voice.

We were the only English staying in the hotel, and we enjoyed the novelty of living amongst foreigners. But *we* were the foreigners and we were asked on more than one occasion "Are you foreigners?" I don't know why anyone asked such a question. My accent should have rendered it an unnecessary one—but Austrians are the essence of politeness. It gave us rather a shock to be asked if we were foreigners—we had never thought of ourselves in that light before!! All the other visitors were Germans and Austrians and were most anxious to be friendly. We had almost forgotten the sound of English, until one day on returning to the hotel for lunch, we saw a new party of visitors tackling the inevitable lettuce which was served with almost every meal. We naturally concluded that they were Germans, but much to our surprise and dismay (though we blush to admit it) we heard the words "Bogey, bogey"!! Herr K. came along to tell us the glad news that there was a Manchester party at the other table—no doubt thinking we would be delighted to meet some of our own countrymen. He chuckled when we told him that they were all right over there. Of course, they would

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be Manchester people. If one ever meets an Englishman out in the wilds anywhere, he is almost sure to hail from Manchester. However, the party was only passing through the village, and within an hour we were *the* young English ladies again.

The scenery was wonderful—high snow-capped mountains, pine woods, lovely lakes and quaint villages. The houses are painted in different colours of mauve, blue, white, &c., and nearly everyone had a religious painting on the outside wall. Everywhere were tiny wayside chapels, shrines, fountains and statues. We left it all with sad hearts and a resolution to return again some day. E. A., Liverpool.

A Plaint.

O readers kind, O readers gay !
Full many a month has passed away
Since first our column saw the light
And started out with prospects bright.

At first the column grew apace ;
Exchanges rushed to fill the space
Allotted, with exclusive views,
With Thoughts on Life, with local news.

O readers kind, O readers gay !
Hope flickers low—alackaday,
Soon, far too soon, you ceased to write,
Your first glad vows forgotten quite.

Your column, once your joy and pride,
Renounced, abandoned, cast aside—
Till Percy Flage, to whom be thanks,
Joined himself boldly to our ranks.

O promise you will now assent
To give this youth encouragement ;
Uphold him, as each month anew
He fills the space assigned to *you*.

Please send your manuscripts along
From each exchange, some hundreds strong,
Poems or prose, long, shorter, short,
Or photographs of any sort.

Perhaps a portrait of yourself
As bathing sprite, or woodland elf,
Or else a snapshot, an' you will,
Of lake or river, vale or hill.

Thus having sought your friendly aid,
I face the future unafraid,
O readers gay, O readers kind !
I know you'll bear my plaint in mind.

Contributions to this column should be addressed : The Editress, "Talk of Many Things," *Telegraph and Telephone Journal*, Secretary's Office, G.P.O. (North), London, E.C.1.

GLASGOW TELEPHONE NOTES.

MR. CHARLES S. SCANTLEBURY, Asst. Traffic Supt., and Miss Phyllis C. Seale were married at St. James' Church, Tunbridge Wells, on July 16, 1930. Although Mr. Scantlebury quietly eluded the boisterous send-off which the lady members of the Traffic Branch had promised him, the section joined in tangible recognition of Charles' entry into the realm of matrimony. While his natural buoyancy is in no way diminished, it is observed by at least the married men of the branch that there is a slight tendency to be less controversial. *Experimentia docet.* The best wishes of all his friends go to Mr. Scantlebury and his wife for a long, happy and prosperous future.

Copy of Letter from Subscriber.—"Dear Sir,—Re my application for telephone at 57 —— Road to remain I am sorry that owing to unforeseen circumstances I would be obliged if you would cancel same and arrange for its removal. When I first thought of keeping it I was under the impression that I would only have to pay a quarter's rent but when your agent called and gave me the necessary information with regard to same, . . . I still thought I could carry it through on behalf of my partner and myself but as this is the first time I have went through the bonds of matrimony I miscalculated owing to the lack of experience. Hoping you will appreciate my point and excuse delay owing to being away on holiday.—Yours respectfully, ——."

Whilst spending a holiday at Blankenese, a small town a little way from Hamburg, and delightfully situated on the Elbe, I took the opportunity of visiting the telephone department in Hamburg. This is housed in a very fine building—not the Post Office—similar to a museum nearby. And indeed I found it a museum of industry. I was fortunate in having an introduction from the Traffic Superintendent, Glasgow, without which "open sesame" I fear I should have had great difficulty in gaining admittance. I was cordially received by Herr Dehn, the District Manager, and was shown over the building by Herr Witt, the Chief of the Trunk Exchange.

I was prepared, of course, to find things on a much larger scale than in Glasgow, but I very soon became aware that my estimate was very far out. I was quite overwhelmed at the very extensive system. The trunk and local exchanges are in this building, except the recently opened automatic exchange. The one-time principal exchange, on this account, is in a state of transition and demolition. (The multiple was "alive" with paper pegs showing the new numbers. The callers were switched through to a separate room where this necessary information was given.) It was difficult to gauge the extent of this exchange, but it will convey some idea of its size when I say that it was four times as large as Glasgow Central Exchange. The apparatus was different in many ways, one of the minor details being a wire protection on the cords at the end of the plug, on the "B" positions.

The trunk exchange contains 600 lines, both short and long-distance lines being worked here. (Apart from this there is a separate room with a large number of lines operating between Hamburg and Berlin.) The difficulty in such an exchange as this must be in operating to so many countries speaking different languages. There were many of the staff who operated in three languages, and one or two who spoke five.

There was a Toll exchange which had the connecting of the outside areas with the automatic.

A very interesting feature was the repeater room, in which several women were employed, one of whom I met had been resident in Belfast at one time. There was also an amount of plant in connexion with the wireless in which the engineer seemed particularly interested.

The operators work 46½ hours per week, which includes night duty once a month. The hours of duty vary each day, working on a rotation of 2½ hours on duty and ½ hour off. The staff, of whom there are over two thousand, are paid monthly. There was a large dining room and rest room where the operators were enjoying an evidently much-needed recuperation. The old Scotch proverb, "Far awa' birds are aye the bonniest," seemed to prove an exception in this case, because conditions pertaining in Glasgow are better all round.

There were many questions I should have liked to ask, but I had already monopolised a good deal of Herr Witt's time, and I felt I could not trespass any further on his kindness, so I thanked him and bade him "Auf Wiedersehen." M. L. TULLOCH.

A Day with Pepys.—Tuesday : On Tuesday take everything they can give you. Not being able to sleep up early to write down my last two days' observations in my Journall. Then did look upon the second part of Hudibras to see if it be as good as the first which is now in great fashion for drollery and which the world cry so mightily up, though it hath not a great liking in me, and though I have tried by twice or three times reading to bring myself to think it witty, I must confess, I cannot see enough where the wit lies. After that to my office, where very busy rummaging my papers, and tearing some and sorting others in order, that so I may have my office in an orderly condition. I took much pains in sorting and folding my papers. Then fell to my Lord Rutherford's dispatch which do not please him, he being a Scott, and one resolved to scrape every penny that he can get by any way. Thence to the Admiralty, where I met Mr. Turner, who did look after the place of clerk of the Acts. He was very civil to me, and I to him, and shall be so, until I get all the assistance I can of him. At 12 o'clock went to the Dolphin, where Sir J. Minnes, Sir W. Batten and I did treat the Auditors and did discourse of our salarys which I now think the Auditors will allow. Then home to dinner, where my wife and I had a small squabble, but I tried the effect of my silence and not provoking her when she is in an ill humour, and so find it very good, for it prevents its coming to that height on both sides which used to exceed what was fit between us. Then made friends with my wife, and spent a little time with her within doors, and a speech out of Hamlett—"To bee or not to bee." Thence by water back again to my office, all the way reading my Lord Bacon's "Faber Fortunea," which I can never read too often. I did a contenting afternoon's work. After that to Westminster Stairs, where I saw a fray between a Dutchman and a waterman, which made good sport. Then was set upon by some poor wretches, whom I did give good words and some little money to, and the poor people went away like lambs, and in good earnest are not to be censured if their necessities drive them to bad courses of stealing or the like, while they lacke wherewith to live. After that met Mr. Evelyn, and had most excellent discourse of him touching all manner of learning ; wherein I find him a very fine gentleman. Thence to my Lords and sat talking with Mr. Moore bewailing the vanities and disorders of the age. What an age is this ! that a man cannot live without playing the knave and dissimulation. Great talk among people how some of the Fanatiques do say that the end of the world is at hand, and that next Tuesday is to be the day. Against which, whenever it shall be, good God fit us all. Then to supper, which did not please me, and then to dance and sing ; and mighty merry we were till about twelve at night, with mighty great content in all my company, and I did, as I love to do, enjoy myself in my pleasure as being the height of what we take pains for and can hope for in this world, and therefore to be enjoyed while we are young and capable of these joys. My wife extraordinary fine to-day, in her flower tabby suit ; and everybody in love with it ; and indeed she is very fine and handsome in it. So home and to bed extraordinary sleepy.

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LEEDS DISTRICT NOTES.

Leeds Post Office Sports.—The Leeds Post Office Sports Club and Telegraph Messengers' Institute held a combined Sports and Garden Fete on Saturday, July 19, at The Hall, Roundhay—the park, marquees, &c., being generously put at the disposal of the sports committee (as on the corresponding occasion last year) by Lord Brotherton.

Conspicuous among the sporting events was the success of Boy Messenger E. Longfellow, who, displaying splendid speed and stamina throughout, carried off the 100, 200 and 400 yds. championships.

The following were the principal results :—

100 yds. Flat Race Championship (W. H. Hancock Trophy).—F. Barber (Postal).

75 yds. Flat Race, Ladies' Championship (Sports Club Trophy).—Miss G. Gubbins (Telephones).

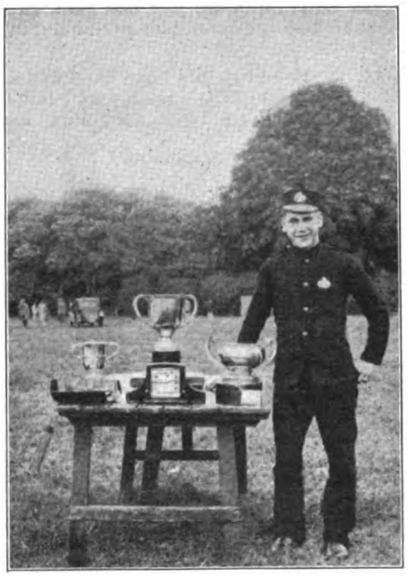
100 yds. Flat Race, Messengers' Championship (Leeds Sportsmen's Cup).—E. Longfellow.

800 yds. Flat Race, Messengers' Championship (G. W. Smith Cup).—S. Hall.

200 yds. Flat Race, Messengers' Championship (Joseph Pickersgill Cup).—E. Longfellow.

400 yds. Flat Race, Messengers' Championship (Stock Exchange Cup).—E. Longfellow.

Half-Mile Flat Race.—W. E. Best (Engineers).



MESSENGER LONGFELLOW.

In addition to the sporting events, side shows and other attractions of a varied and fascinating character provided much entertainment—the shooting range, in particular, revealing unsuspected sharpshooter talent.

Lt.-Col. Jayne, D.S.O., O.B.E., M.C. (Postmaster-Surveyor), Messrs. J. Atkinson (Superintending Engineer), T. A. Bates (District Manager), J. Bownass (Assistant Postmaster) and C. H. Mansell (Chief Telegraph Superintendent) were present, while the interest taken in Leeds Post Office sporting events was evinced by the presence of the Head Postmasters of Bradford, Huddersfield, Halifax, Wakefield and Skipton.

After apologising for the absence of Mrs. Jayne (who, unfortunately, was unable to be present owing to indisposition), Col. Jayne, in a humorous speech, commented on the value of sports in relation to discipline and performance of duty and called upon Mrs. Bownass to present the prizes. Mr. Mansell then thanked Col. Jayne and Mrs. Bownass for their presence and support, and incidentally referred to the improved showing of the Leeds Boy Messengers at the recent educational examination, as evidence that the special attention and effort was not entirely devoted to field sports.

Mr. Bownass concluded the proceedings by moving a vote of thanks to the organisers of the fete.

The band of the 49th W.R. Royal Corps of Signals provided music during the evening.

A Bradford Experience.—Under the impression that monitors are gifted with second sight and that a telephone exchange is ever an information bureau, a subscriber demanded the number of "a potato merchant somewhere in Scotland." He had no idea of the merchant's name nor the district in which he resided, but was most indignant and threatened the whole staff with immediate dismissal when the monitor was unable the supply the number without hesitation.

Heard on the Observation Circuit.—The "B" operator was somewhat tardy in answering, with the result that she received a hearty ring in the ear, administered by the distant operator. In a very grieved tone she demanded "Is your father a bell-ringer ?" to which remark came the lightning rejoinder from the other end, "No, he's a waiter." Even the countenance of the blasé listener was moved to a smile as she recorded the witticisms in the "irregularities" column.

Headquarters Innovations make for Brighter Switchrooms.—The fitting of the new orange labels recently authorised for outgoing junction multiples was completed at Leeds Exchange in June last, and has produced an effect very pleasing to the eye, in fact, one telephonist was heard to remark that the arrival of autumnal tints in June appropriately emphasised the brevity of the English summer.

WESTERN DISTRICT NOTES.

ON Saturday, July 12, the staff from the Western District Manager's Office spent a very enjoyable half-day outing, in perfect weather, at Slapton Sands. The party, numbering 47, left the District Office at 12.40 p.m. by charabanc and halted at Haldon, where an alfresco lunch was indulged in, and a very merry lunch it was. The papers relating to sandwiches were duly filed as per service instructions (or disposed of, same thing), and the party then proceeded via Newton Abbot, Totnes, Kingsbridge to Slapton. After tea an exciting cricket match took place between the Ledgers Section and the Fees, umpired by Mr. Beck, the District Manager. The ladies of the Fees Section made a gallant show and scored 38 runs against a feeble 12 by the Ledgers. An unsuccessful appeal was made by the latter that it was a case of "under recording," but this was strongly repudiated as one of the Ledger side was in charge of the score.

The journey home was made via Dartmouth, Paignton, Torquay and Teignmouth, reaching Exeter about 10.30 p.m.

The community singing on the journey was a great feature and the Western District staff are prepared to give points to any other departmental staff throughout the country in this direction.

Mr. E. B. M. Lord, Assistant Traffic Superintendent, has been promoted to the rank of Traffic Superintendent, Class 2, at Glasgow. On leaving the Western District he was presented by the staff of the District Office with an umbrella, golfing umbrella and a case of hair-brushes as a token of their esteem, and with every good wish for his future progress in the service.

The presentation was made by Mr. T. A. Beck, District Manager, who in a few well-chosen remarks, expressed the hope that Mr. Lord would be happy in his new sphere of operations and that no doubt he would find the umbrellas of considerable service in the North after his sojourn in "Glorious Devon."

On Aug. 2, Mr. S. Payton, Assistant Traffic Superintendent, became a benedict. In the absence of the District Manager and Traffic Superintendent, Mr. G. D. Bateman, Traffic Superintendent, Class 2, on behalf of his colleagues and the staff of the District Office presented Mr. Payton with a set of cutlery and fish knives and forks, with every good wish for his domestic happiness in the future.

It is understood that there is now a motor-cycle for sale.

F. J. F.

SCOTLAND WESTERN DISTRICT NOTES.

ON the occasion of his leaving the Scotland Western District to take up duty, on Aug. 1, 1930, as Staff Officer of the Leeds District, Mr. Macdonald, Chief Clerk, was presented with two original etchings as a token of the esteem in which he was held by all members of the staff. Mr. Thyne, District Manager, in making the presentation, in a brief but pointed speech conveyed to Mr. Macdonald the well wishes of the staff, and closed with the hope that Mr. Macdonald's work and worth may in the future be still further recognised.

Mr. Finlay, Traffic Superintendent, Mr. Brodie, the Contract Manager, and Mr. Dewar, Higher Clerical Officer, also spoke on behalf of their sections.

Mr. Macdonald suitably replied.

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ABERDEEN NOTES.

Promotion of Mr. Coulsell.—An interesting ceremony took place on the evening of July 3, when the staff assembled in the District Manager's room to pay tribute to Mr. W. S. Coulsell on his promotion to Contract Manager, Class I, Reading. Mr. Coulsell was presented with a very handsome cabinet gramophone. Mr. R. L. Forrester acted as chairman and the presentation was made by the District Manager, Mr. Stanley A. Young. The speakers also included Mr. Archd. Clow, Chief Clerk, Mr. A. C. Scott, Assistant Chief Clerk, Mr. H. Webb, Assistant Traffic Superintendent and Mr. J. Brown, Contract officer, Class I, all of whom spoke in glowing terms of the splendid work performed by Mr. Coulsell during his 6 years as Contract Manager at Aberdeen. During Mr. Coulsell's tenure a great extension of the telephone system to all parts of the north of Scotland took place, and it is interesting to note that nearly 150 new exchanges were opened during this period. Mr. Coulsell was particularly keen on this class of work and the big development which in recent years has taken place is undoubtedly due to Mr. Coulsell's personal and untiring efforts in this direction. To anyone unfamiliar with the Aberdeen District the enormous difficulties to be encountered and overcome can scarcely be imagined. On many occasions Mr. Coulsell set forth in the middle of winter to prospect for new exchanges in the most remote and almost inaccessible districts in the Highlands. Doubtless Mr. Coulsell's duties at Reading will be of a less strenuous nature, and the best wishes of the Aberdeen staff follow him in his new surroundings. Mr. Coulsell has been succeeded by Mr. R. C. Rae, late Contract Manager of Middlesborough, who has already established himself a worthy successor.

Telephone Progress.—An event of the greatest importance took place on Aug. 1, 1930, and that was the linking up of the exchanges in the Isle of Skye to the mainland. The lack of trunk communication in the past has been a source of grievance, and this had the effect of retarding to a very great extent the growth of the Skye group. Now that communication has been established, a big development is looked for in this direction. The Macleod passed the first call to the Provost of Inverness and McLeod of Skeabost House conversed with the District Manager, Mr. Stanley A. Young. In both instances speech was all that could be desired.

It will be seen that the Aberdeen District is maintaining its reputation with regard to the opening of new exchanges, Kildrummy, which was opened on July 10, 1930, Drumlithie on July 14, 1930, and Knock on Aug. 1, are to be added to the considerable number of rural automatic exchanges recently established in the Aberdeen District.

Applecross!—At various times the motor journals break forth into lurid language concerning reliability trials where, amongst other places, Tornapress and Applecross, are concerned. It was necessary on June 17 to visit Applecross and certain officers of the Aberdeen staff decided to sample the horrors of the road. The total distance from Lochcarron at sea level is 18 miles. After rising to 452 ft in 2,000 yds. (a mere detail) the climb begins gradually but gets worse as one proceeds, until a height of 2,054 ft. is attained. This point rejoices in the name of Sgurr a chaorachain (but it looks worse).

Many motorists know Applecross quite well, but for those who do not, it might be as well to describe it as being a mere scratch in the side of a mountain, with a surface like a pebbly beach. There are three hairpin bends on a gradient of 1 in 5, and each bend requires at least one reverse. On restarting for the forward direction, one naturally gets wheel spin and loose stones are shot away at the rear in a two-foot stream. Of course, your radiator boils long before you reach the point with the fearful name. The usual procedure is to go up one day and back the next, but we did the lot in three hours' running time, and probably earned a gold medal (*avec* knobs). One day, when you read in the P.O. Circular—

"Applecross—Rural exchange"

you will see the result of three hours' cruelty to an 11-h.p. saloon car, not to mention the feelings of the occupants.

Mr. D. Smith.—In the departure of Mr. D. Smith, Traffic Department, the staff at Telephone House, Aberdeen, have lost a valued friend and a most efficient officer. Mr. Smith entered the service as a boy messenger and took second place in Britain in the 1920 examination. Since then he has been in the District Manager's staff. His appointment to the post of Superintendent, Post and Telegraphs, Federated Malay States, is a well-deserved promotion, for his ability is undoubted. On July 23 Mr. Smith was met by the staff and presented with two cabin trunks. In the unavoidable absence of Mr. Young, District Manager, Mr. Clow, Chief Clerk, presided. Mr. Forrester, Traffic Superintendent, made the presentation, and testimony to Mr. Smith's popularity was voiced by Mr. Scott, District Office, Mr. Webb, Traffic, and Mr. Brown, Contract Department.

C.T.O. NOTES.

Promotions.—Mr. G. T. Archibald, Asst. Controller to Deputy Controller. Messrs. J. C. Bowden, L. J. Salter, A. H. Waghorn, H. G. Ball, Telegraphists to Overseers.

Retirements.—Messrs. A. W. S. Bird, Asst. Superintendent (Cable Room), D. H. Spalding, F. W. Turpin, H. A. Webberley (Cable Room) and C. J. W. Barrett (Cable Room), Overseers, and C. F. Searle, Telegraphist.

Obituary.—The death of Mr. H. Pearce came as a severe shock to his many friends at the Threadneedle Street B.O. He was 43 years of age and passed away after three days' illness. Our deepest sympathy is extended to his relatives in their sad loss.

C.T.O. Amateur Gardeners' Society.—The Society held its Rose Show in the latter end of June. The cup for the most meritorious exhibit was won by Mr. W. J. Jones, of the Cable Room.

Sport: Tennis.—"The Radway Cup."—This cup was won by Threadneedle Street B.O. "A" team from the T.S. "A" team by 5 games to 2.

Cricket.—Curtis Bennett Shield.—The "Centels" met the Board of Trade in the first round and won by 222 runs to 139.

In the second round the "Centels" met the Exchequer and Audit team, who, batting first, declared at 205 for 7. The "Centels" won by 6 wickets, W. T. Cook scoring 104 and Drummond 57.

By beating Southampton by 3 wickets the "Centels" passed into the fourth round.

Herbert Parker.—Normally due to retire in August this year, Herbert Parker was unfortunately obliged to accept superannuation from the 1st of July owing to ill-health.

His activities on behalf of the staff has been the work of a lifetime. It is not within the recollection of anybody at present employed in the C.T.O. when Herbert Parker has not been associated with, and at the same time taken a leading part in, the problems of the staff associations. He stood shoulder to shoulder with those stalwarts and leading lights of other days, S. W. Belderson, R. H. Davis and C. H. Garland, all of whom left T.S. some years ago. It was in company with these contemporaries that he was "known" locally and nationally as Parliamentary Secretary of the P.T.C.A., actually succeeding Sam Belderson in that office, and it would be impossible to assess the value of his labour on behalf of his fellows during this period. Suffice it so say that the work demanded all his spare time on deputations, clerical work, lobbying, giving advice and assistance to all and sundry. Throughout all this vast amount of work he was unwearied in well-doing, and applied himself to the task immediately at hand with all the sincerity that was so characteristic of his nature, yet withal remaining distinctly human and approachable on the minor difficulties that crop up in a large office like the C.T.O.

We remember with admiration and gratitude his services, and sincerely regret that having fought the good fight for so long he now leaves us not quite "fighting fit." We hope for a speedy improvement in health and extend to him in the name of the C.T.O. best wishes for long life and happy retirement.

"May his wood always lie nearest the jack."

C.O.D.O.C.—The C.O.D.O.C. are at present actively preparing for their autumn production. "A Country Girl" is being presented for three nights, Oct. 14, 15 and 16, at the Guildhall School of Music, John Carpenter Street, Blackfriars, and early application for tickets is advisable. Tickets may be ordered through any member of the club or from the Ticket Secretary, Mr. J. Henry, Room 17, C.T.O. The prices of the seats will remain at the same low level, 3*s.* 6*d.*, 3*s.* and 2*s.* 4*d.*, and a few at 1*s.* 10*d.*

During the summer months the C.O.D.O.C., with the co-operation of the C.T.O. Arts Society, have been promoting a "Poster Competition," the subject being "A Country Girl." The competition was divided in two sections, artistic and photographic, and the entries all showed quite a high standard. The results were as follow:—

Artistic Section.— Mr. J. W. Gibbs (K. Divn.).
Photographic Section.—Mr. F. A. Christopher (T.S.F.).

A consolation prize awarded by the Civil Service Arts Magazine was obtained by Mr. H. W. Lamkin (Mechanic).

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NEWCASTLE-ON-TYNE AND DISTRICT NOTES.

J. R. M. Elliott, M.I.E.E.—Mr. John Robert Maddison Elliott, Superintending Engineer, Northern District, retired from the service on Aug. 9. He entered the service as a Telegraph Messenger in 1883, and reached the high rank of Superintending Engineer at 42 years of age, after successive appointments as Telegraphist, Relay Clerk, 2nd Class Engineer, Engineer, Staff Engineer, and Assistant Superintending Engineer.

Mr. Elliott has served in Wales, Scotland, London Headquarters and the Provinces, and has been in charge of works as far afield as the Orkneys, Shetlands and Channel Islands. His 47 years' service covered a period of great change and development in electrical communications, and he has

MR. J. R. M. ELLIOTT.

a wealth of entertaining reminiscences to recount. His service finished as it began at his native town, Newcastle-on-Tyne. He was held in high esteem by all the postal, municipal and public utility officials with whom he came in contact during the discharge of his onerous duties, and he was held in affectionate regard by all ranks of the staff under his charge. It can be said quite definitely that there was no more popular Superintending Engineer in the country than J. R. M. Elliott, and he leaves a host of friends behind him who wish him the best of health and enjoyment in his well-earned retirement.

Wedding bells have been busy recently in Newcastle-on-Tyne Telegraphs, and we have made our official good-byes to Misses L. Whitfield, L. Dale and M. Pollock. All three were popular members of the staff, and if good wishes count for anything, glorious sunshine, blue sky, and smooth sailing through untroubled waters is assured them.

Newcastle and District Post Office Sports.—The third annual meeting of the above organisation was held in fine weather, on Saturday evening, Aug. 9, on the College of Medicine Athletic grounds, Heaton Road.

The attendance was large and fully representative of all ranks and Departments of the Service in the district, including Messrs. F. Ferguson (Postmaster Surveyor), E. Brydon (Asst. Postmaster), D. H. Thomson (Chief Supt. Telegraphs), J. R. M. Elliott (the retiring Superintending Engineer) and F. G. C. Baldwin (his successor), J. A. Motyer (Chief Clerk), J. D. W. Stewart (District Manager, Telephones) and many others.

The sport provided reached a very creditable standard. The oldest competitor in the cycle event was Mr. H. B. Pilkington (N.T. Telegraphs), who is 55 years of age and gets over the ground like a young 'un.

Dodds, of Berwick, won from scratch, but he had to hurry all the way to catch Herbert.

The ladies' races were keenly contested. The form displayed by the girls was surprising—in fact at one point in the three-legged race it was simply staggering. From one angle this race appeared for a moment to have been won by a large lady with eight legs !

Mr. J. D. W. Stewart, in his own original style, introduced to those present Mrs. Ferguson, the wife of our recently appointed Postmaster-Surveyor. She presented the prizes at the close of the proceedings with an easy grace that pleased everyone. A fine bouquet of carnations was presented to Mrs. Ferguson by little Miss Crofton, who was rewarded with a hug and kiss and a present in return.

To the committee, of which Mr. E. Brydon is Chairman and George Bell Secretary, are due our best thanks for the efficient manner in which the programme was carried out.

Event succeeded event with a smoothness that drew favourable comment even from those who had attended sports meetings for 30 years or more. There was one rather regrettable incident. The only official who did not visit the judges' tent was the referee—he did not know of its existence ! This was rightly held to have been very bad " staff work " on the part of a Scot.

LIVERPOOL NOTES.

FURTHER blessings have fallen in Liverpool in the matter of promotions. Mr. R. A. David, author of the article on the T.T. Races in the I.O.M., which appeared in last month's issue of the *Journal*, has been promoted to the post of Traffic Superintendent, Cl. I, at Bristol.

Mr. David has had a long sojourn in the Liverpool Traffic Office, which he joined in 1907, and has made himself deservedly popular with all. He carries with him the sincere good wishes of his colleagues and friends in the service, tinged with regret that he has had to leave us—we hope to say something more about him later.

Mr. J. G. Curtis, Clerical Officer, is also to be congratulated on attaining promotion to Higher Clerical rank. He takes up his new duties at the Chester Telephone District Manager's Office.

Miss M. J. Higgins, Shorthand-Typist, from the Postmaster-Surveyor's Office, has been promoted to a Clerical Officer's post in the District Manager's Office.

Miss H. E. Cowell, an ex-telephonist from the I.O.M., is a new recruit to the writing class in the Liverpool Traffic Office, she having transferred her allegiance from the plug to the pen. We give her a cordial welcome to the larger island.

Mr. H. B. Carroll, Traffic Superintendent, Class II, is again returning to the Liverpool fold after a brief time of service in the North-West District. He is filling the vacancy caused by Mr. David's promotion to Bristol. Liverpool still holds the chief place in Mr. Carroll's affections.

Miss Dorothy Greenwood, of the Liverpool Traffic Department, in her leisure hours, is an exponent of the dramatic art. At the special request of the management of the Liverpool Playhouse Company, she preceded a play (" What's Bred in the Bone ") at the Winter Gardens, New Brighton, with a sketch entitled " Peccadillo," in which (*vide* Press notice) Dorothy Greenwood was described as pre-eminent.

THE BOGOTA TELEPHONE COMPANY.

As an example of exceptional operating development it is noteworthy to observe the following statistics of the Bogota Telephone Company since it came under the aegis of the Cable, Telephone and General Trust, Ltd., in June of last year. At that time the Company, which supplies the capital city of perhaps the most progressive State in South America, had 7,000 stations, a figure quite disproportionate to the size and importance of Bogota.

As a result of the progressive policy introduced by the new management, the number of stations in service at the end of June of this year approached, if not exceeded, 11,000, representing an increase of approximately 57% per annum. For the first five months of 1930 the increase in stations over the total at Dec. 31 last actually represented a rate of 60.29% per annum, a remarkable figure in any circumstances, and even more noteworthy when regard is had to the world depression from which Colombia is not immune.

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LANCASTER NOTES.

MANCHESTER Telegraph Bowling Club journeyed to Lancaster to play the return fixture, at the Bowerham Hotel. Arriving about 4.30 p.m., it was decided to have tea prior to commencing the game. At the termination of tea, Mr. H. Wood, head postmaster, Lancaster, welcomed the Manchester friends. He was greatly disappointed when he found that circumstances would not allow him to go to Manchester with the Lancaster team a few weeks ago. Nevertheless, he had made amends by his visit to that city last Saturday, on the occasion of the Telegraph Messengers' Sports Day, and had experienced a hearty welcome. He hoped that they would make this an annual event.

During tea the ground had dried, and the games, shown below, resulted in a win for Lancaster by 45, reversing the result at Manchester. However, in the foursomes, Manchester won by 23. Leaving Lancaster about 9.15 p.m., the Manchester fellows had a hearty send-off, some of them no doubt thinking of the four to seven miles walk after getting to the town—every man missing the last 'bus. The scores were :—

Manchester Tels.		*Lancaster P.O.*	
5	F. Wakefield	J. Armistead	15
5	P. Walker	C. Bainbridge	15
14	B. Evans	F. Comlinson	15
15	E. Mitchell	... W. Keen	9
9	A. Alcock	... W. Marshall	15
15	T. Wood	... V. Pearson	7
15	R. Edge	... S. Dixon	13
15	O. Walker	... T. Lucas	11
5	W. McKenzie	... T. Ball	15
2	W. Coulson	... E. Williams	15
5	W. Greenfield	... A. Fox	15
10	J. Wood	... H. Barber	15
15	F. R. Turner	... A. Price	9
15	F. Mechlenburgh	F. Lightowler	10
15	J. Schofield	... J. Houghton	10
7	W. I. Oldcorn	... H. Wood	10
7	T. Parker	... Downham	15
174			219

FOR OUR ADVERTISERS.

THE following contracts are open, and all references should be made, unless otherwise stated, to the Department of Overseas Trade, London, S.W.1 : *South Africa*, Johannesburg, for S. African Railways and Harbours. Supply of incandescent electric lamps for 12 months (A. 9967). *Australia*, Melbourne. Sept. 23. Posts and Telegraphs. Supply of rectifiers and charging resistances (Schedule No. C. 639) (Ref. A.X. 9968). Also, same department, Sept. 30. Switchboard, instrument and test plugs and sleeves (Ref. A.X. 9937). *Mozambique*, Lourenco-Marques. Oct. 17. Port and Railway Board. Supply and installation of automatic signalling system on Ressano-Garcia Line (A.X. 9971). *Australia*, Melbourne. Oct. 14. Supply and delivery of condensers for Posts and Telegraphs (Ref. A.X. 10,004).

A confidential report on the market for primary and secondary batteries in Brazil has been prepared by the Department of Overseas Trade from information furnished by the Commercial Secretary at Rio de Janeiro and issued to firms whose names are entered on its special register. United Kingdom firms desirous of receiving a copy of this report will please communicate with the D.O.T., 35, Old Queen Street, London, S.W.1 (Ref. A.X. 9919). The D.O.T. has received from the British Legation at Oslo a translation of the regulations governing radio installations which have recently been issued by the Norwegian Ministry of Commerce. Upon application to Room 43 a copy of this may be seen at the offices of the D.O.T. There is also a second copy which is available on loan to interested firms in order of application.

The British Embassy in Brussels, Commercial Section, in a report on economic conditions in Belgium, says that as regards radio business, while "British loudspeakers still retain their superiority in the expensive field." "United Kingdom firms have yet to produce a receiver for the Continent which can compete for the needs of the average Belgian buyer."

J. J. T.

OBITUARY.

A TRIPLE LOSS IN THE C.T.O. RETIRED OFFICERS' RANKS.

MEMBERS of the old S.G. office and those connected with the present T.N.S. Branch of the C.T.O. will hear with regret of the death of Mr. W. G. Foord, who passed away at his home at Becontree Heath in July last, after a severe illness. He was for many years attached to the Stock Exchange and T.N.S. centres, and was one of a small band of telegraphists selected to take part in the opening of the latter office as a public branch office nearly 50 years ago. He entered the C.T.O. from the School in 1887, and was soon picked out for duty at the "Stock." Twenty-five years later, on his promotion to an Overseership, he was placed in charge of C.L.S., retiring from that position in 1920, upon reaching the age-limit. As a volunteer, under the late Captain Blanchard in the old 49th Middlesex Rifle Volunteers, he did well at the Bisley Rifle meetings, along with Messrs. A. G. MacEwen and R. J. Talbot.

The mention of the name of Miss Emily (Trix) Ampleford will doubtless recall to many a much respected and esteemed colleague of the C.T.O. who, entering the service in 1872, prematurely retired in 1902 with the rank of Asst. Supervisor owing to failing health. To these the news of her sudden death (she was seized with cardiac trouble while crossing Fratton Bridge, on July 12), will come as a real shock. The collapse was immediate and she passed away even before assistance could be rendered by a R.A.C. scout who happened to be near. Deceased was actually on a visit to friends near Emsworth, and herself had recently suffered the loss of her only sister, Miss Maud Ampleford, formerly of the L.P.S., followed by the death of her remaining brother. To her sister-in-law, Mrs. W. H. Ampleford, *née* Miss A. M. Eley, also formerly of T.S., and to her nephews, the very sincerest condolences of many old C.T.O. friends and colleagues is respectfully tendered. One of the nephews is at present serving in the Eastern Telegraph Company, as Technical Officer at Aden. Will Telegraph Service papers please copy ?

To the above, it is regretted, must be added the sudden death of Mr. J. H. Couldrey, late Superintendent of the I.D., on Aug. 6, at a Scarborough hotel, where he was staying with his wife. A verdict of angina pectoris was pronounced. The funeral took place at Potters Bar and was attended, amongst others, by Messrs. T. J. Allison, A. W. Judd, and Walter Smith, all formerly of the now defunct I.D. Mr. Couldray entered the Telegraph Service at Oxford in 1873 and transferred on promotion to the Secretary's Office as a News Distributor in the Intelligence Branch, which latter, upon being transferred to C.T.O. control, Mr. Couldrey was made an Asst. Supt. Telegraphs in 1898, and in 1906 Superintendent, which office he held until his retirement in 1920. A curious result of reversion due to the whirligig of time.

J. J. T.

PARLIAMENTARY ITEMS.

ON July 22 Mr. H. B. Lees-Smith informed Mr. Day that the number of telephone calls between the U.S.A. and Great Britain was 546 in April, 676 in May, and 641 in June. The average chargeable duration of these calls was 6½ minutes each. They were all dealt with by the Post Office wireless station at Rugby and its receiving station at Baldock. Also on same date, in reply to Dr. D. G. Somerville, Mr. H. B. Lees-Smith said that on June 30 last there were "56 'wireless exchange' systems, with a total of 12,172 subscribers. The principal towns concerned were : Blackpool, Bradford, Braintree, Brighton, Burnley, Clacton-on-Sea, Ely, Frinton-on-Sea, Hull, Hythe (Hants), Luton, Lytham St. Anne's, Portsmouth, Ramsgate, Swindon and Thetford. For relatively small weekly payments the subscribers obtained reception of wireless programmes at loudspeaker strength and were saved the expense and trouble attaching to the purchase and upkeep of separate receiving sets.

On July 29 Mr. Day asked the P.M.G. whether any steps had been taken for the purpose of arriving at international regulations with reference to wavelengths. Mr. Lees-Smith said that the International Radio-Telegraph Regulations, which were drawn up at a conference at Washington in 1927, contained provisions for the allocation of wavelengths among the various types of services. Those regulations would remain in force until 1932, when they were due to be reconsidered and brought up to date at a conference to be held at Madrid.

Also, on the same date, Mr. Lees-Smith informed Mr. Wellock that the average weekly number of wireless-telephone calls to or from Australia since the opening of the service about 12 weeks ago was 47. The number fluctuated considerably from week to week, but the general level of traffic was considered satisfactory for a new service.

J. J. T.

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A BRIEF CHRONOLOGY FOR STUDENTS OF TELEGRAPHS, TELEPHONES AND POSTS.

BY HARRY G. SELLARS.

(*Continued from page* 234.)

1903, May ... Trunk line between Liverpool and Warrington fitted with air core loading coils.

International Telegraph Conference held in London. Artificial code words allowed in telegrams.

Postmaster-General decided to grant a second postal delivery when revenue covered the cost—calculating ½*d.* a letter and 1*d.* a parcel.

Fees for official redirection of letters—first year, free; second year, 1*s.*; third year, 1*s.*; each subsequent year, 5*s.*

1903, July 1 ... Postal Order business extended to almost all offices.

British postal order system extended to all Colonies, except Australia, and dependencies.

Series of values of postal orders raised to 21*s.*, with orders for every complete 6*d.* All orders provided with counterfoils for retention by the sender.

1903, Aug. 4 ... First International Wireless Conference met at Berlin.

1903, Oct. 1 ... Russian Post Office opened Siberian route for mails.

James Wimshurst died.

Indo-European Telegraph Company established direct automatic wheatstone telegraph working between London and Karachi. (Creed perforators and printers have since been introduced.)

Commercial Pacific cable laid from San Francisco to Honolulu.

1903, Dec. 16 ... *The Times* sent 88,847 telegrams advertising the "Encyclopedia Britannica."

12,000,000 money orders issued.

Deficit of £107,403 on Post Office Savings Bank.

1904, Jan. 1 ... Maximum limit for money orders raised to £40 with commission ranging from 2*d.* for £1 to 10*d.* for £40.

Rates for telegraph money orders fixed at 2*d.* in excess of ordinary money order rates. Maximum limit raised to £40.

Poundage for foreign telegraph money orders raised to 6*d.* in excess of rates for ordinary money orders, and maximum limit increased to £40.

Term "Book Post" changed to "Halfpenny Packet Post."

1904, Jan. 30 ... Trunk telephones transferred from the Cable Room, General Post Office, London, to the Central Telephone Exchange, Carter Lane, London. 144 trunk circuits (including foreign lines) and 274 junction circuits were transferred.

1904, Mar. 24 ... Postmaster-General (Lord Stanley) announced that discussions were proceeding with a view to exercising the option to take possession of the National Telephone Company's system on Dec. 31, 1904.

1904, April ... Siberian Mail route suspended owing to hostilities in the Far East.

Post Office introduced the call wire system for telephone trunk working between London and Liverpool.

Duddell devised an oscillograph for examining telephone speech waves and a thermo galvanometer for measuring minute alternating currents.

B. S. Cohen designed a bolometer for measuring rapidly fluctuating currents.

Just, Hanaman and Kuzel introduced the tungsten electric lamp. Dr. W. D. Coolidge invented a method of producing tungsten wire.

1904, Oct. 31 ... Earl of Derby, Postmaster-General, declared himself in favour of Imperial cash on delivery system, except in the inland postal service.

Cable inductance loading coil introduced by M. I. Pupin and G. A. Campbell, working independently. Priority of discovery adjudged to Pupin.

Otto Nussbaumer, of Austria, constructed a wireless telephone apparatus.

1904, Nov. 16 ... J. A. Fleming patented a two-electrode thermionic valve based on Edison's discovery of 1883.

Wireless Telegraphy Act passed conferring licensing powers on the Postmaster-General.

Acknowledgments for deposits of less than £1 in the Post Office Savings Bank discontinued.

1904, Dec. 31 ... Loss on Telegraphs, £1,191,127.

1905, Jan. 1 ... Post Office began to collect and deliver "ship and shore" wireless telegrams. (Number of telegrams dealt with during the year, 11,652.)

1905, Feb. 14 ... Proposed agreement between Postmaster-General and the National Telephone Company submitted to the House of Commons.

Murray devised a ring letter block storage telegraph transmitter, and also a letter block metal storage transmitter in which balls are released and drop into letter blocks on an endless belt.

(Dr. L. M. Potts designed a disc storage telegraph transmitter with a five-unit code.

G. R. Benjamin, of the Western Union Telegraph Company, arranged a method of storing letter signals.)

1905, Apr. 1 ... Official parcel post instituted with United States of America, with maximum weight of 4 lb. 6 oz. Semi-official service continued through the American Express Company with maximum limit of 11 lb.

Stanley revision of pay, &c., in the Post Office took place.

1905, May ... First common battery automatic telephone exchange opened at South Bend, Indiana.

1905, May 22 ... Proposed agreement with the National Telephone Company referred to a Select Committee of the House of Commons.

Ballini devised systems for directional wireless transmission and reception.

(Pichard, Robinson and Round also invented directional wireless receivers.)

1905, July ... Sums not exceeding £1 withdrawable from Post Office Savings Bank on demand without reference to headquarters.

1905, Aug. 9 ... Agreement between the Postmaster-General and the National Telephone Company ratified by the House of Commons by a majority of 77 votes.

1905, Sept. 1 ... Agreement signed by the Postmaster-General and the National Telephone Company fixing the conditions for transfer of the Company's undertaking in December, 1911, which had been considered by a Select Committee of the House of Commons, came into force.

Baudot multiplex introduced into India by Messrs. Tyrrell, Barrett and Dykes.

Pupin loading coils applied to some telephone circuits in London.

Dr. Lee de Forest introduced a "grid" between the filament and the plate in Fleming's thermionic valve.

(Dr. F. B. Jewett experimented with the termionic valve in connexion with telephony.)

1905, Nov. ... Postal Orders issued with spaces to which stamps could be affixed to make up odd amounts. Orders for 10*s.* upwards printed in red.

Marconi devised directional aerials for wireless communication.

Crehore, following the suggestion of Jarvis, described a method of driving telegraph distributors by "remote control."

Telegraph money order service started with Denmark.

1906, Jan. 1 ... Limit of compensation for inland registered packets raised to £400. Tariff ranging from 2*d.* for £5 to 1*s.* 10*d.* for £400.

For telegrams delivered beyond the three-mile radius, charge reduced to 3*d.* for each mile beyond the free delivery area.

(*To be continued.*)

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